The Concise

HOUSEHOLD ENCYCLOPEDIA



LACQUER, GESSO AND BARBOLA: EXAMPLES OF MODERN STYLES ON VARIOUS MATERIALS

Fig. 1. Chinese lacquer lamp stand with silk shade. Fig. 2. Bowl in Barbola work . Fig. 3. Papier-mâché tray illustrating a copy of an old piece. Fig. 4. Flat brushwork on leather with lacquer powder. Fig. 5. Box in raised gesso. Fig. 6. Paralite powder bowl with raised design. Fig. 7. Barbola table wreath or mirror frame. See entry Lacquer Work for the Amateur.

J.A. HAMMERTON
Editor

The Concise
HOUSEHOLD
ENCYCLOPEDIA

A Practical Guide to Every Branch of Homecraft by the Leading Experts on Builing, Decorating, Furnishing, Collecting, Woodwork, Amateur Mechanics, Cookery, Domestic Economy & Law, Health, Needlework, Poultry, Pets & Animals, Hobbies, Games, Making & Mending

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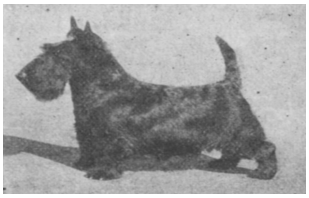
ABERDEEN TERRIER. The Aberdeen or Scotch terrier is an excellent housedog, a good ratter, and readily teachable. From 9 in. to 12 in. high, it has a short, hard, wiry coat of iron-grey, brindle, black or sandy, and soft under-fur. A white variety should have no admixture of other tints. The outer coat is of uniform density, about 2 in. long, and without silkiness or curling. The dog is shortbacked and rather flat-sided, with strong hindquarters; short legs and small, short-haired feet.

The head is rather long and domed, with a drop between the eyes to the muzzle, which tapers to the broad, black nose projecting over level jaws. Neck short and muscular, shoulders sloping, chest broad and deep ; small, pointed, velvety ears. *See* Dog.



Aberdeen or Scotch terrier, prize-winning specimen.

ABSCESS. This name is given to a collection of matter or pus, of which there are two distinct kinds, acute and chronic.

Acute Abscess. The entry into the body of germs which cause suppuration may give rise to an acute abscess. If an abscess occurs the result is the collection of a thick yellowish fluid surrounded by a thickened layer of tissue which constitutes the wall of the abscess. This may occur anywhere ; it may be superficial or it may be deep. The fluid is always under pressure, and this forces it along the path of least resistance, usually to the surface.

An acute abscess produces pain and tenderness. There is also swelling, at first hard and brawny, but later soft, particularly in the centre. The pus is finding its way out, and is said to point at the spot where it will reach the surface, indicated by a deeper redness. The skin becomes very thin, with an increase of pain, and finally the abscess bursts. The patient suffers from fever, not very much, perhaps, in the case of small abscesses, and may have a rigor—that is, feel cold, even to the extent of his teeth chattering. Then he will feel hot, and finally his skin, which has been hot and dry, will be covered with profuse perspiration. There will be several fits of this alternate heat and coldness, but the discomfort will subside as the abscess ceases to discharge.

Treatment is a matter for a surgeon. While the abscess is forming, relief may be afforded by resting the part and also by raising it (e.g. with a sling). Fomentations may also be useful, and these can be wrung out of hot water in which boracic acid has been dissolved (1 oz. to the quart) and covered over with gutta-percha tissue or jaconet. But when pus is definitely present it must be let out.

Chronic Abscess. The second kind of abscess, which is generally painless and may dry up without bursting, is a form of tuberculosis (q.v.), caused by the tubercle bacillus.

ABUTILON. Evergreen shrub with bell-shaped flowers and handsome leaves,a desirable climber for rafters or pillars, or planting out. The best varieties for growing under glass to flower in April are: Darwinii, orange; fleur d'or, orange and red; canary bird, yellow; boule de neige, white; Princess Marie, rose lake.



Abutilon. Flower spray,showing drooping blossom and vine-like leaf.

Propagation is by cuttings of young wood struck in a temperature of 60° in summer. Also from seeds in a propagator or over bottom heat. They are generally sown in spring. Pron. A-bu'-ti-lon.

ACACIA. One of the acacias is the wattle or mimosa (q.v.). The acacia tree of suburban gardens is Robinia, or false acacia (q.v.).

ACANTHOLIMON. Dwarf evergreen plants, somewhat resembling thrift, but with stiff, spiny leaves, suitable for the rockery. A popular species is glumaceum, which bears a profusion of rose-coloured flowers in summer. Venustum also has a rose flower.

These sea lavenders thrive in warm, gritty, well-drained soil. Take cuttings or layers in the late summer. The slips must be wintered in a cold frame, and make good plants in the second year. Pron. Ak-an-tho-li'-mon.



Acanthus. Flower spike of a common variety.

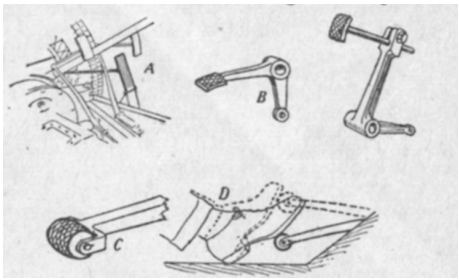
ACANTHUS. Of the two species of acanthus, spinosus is so called from its spiny leaves; mollis, or bear's breech, is characterised by large, deeply cut leaves, with soft spines. The plant grows about five feet high, flowering in summer, and is well adapted for herbaceous borders. Latifolius, a form of mollis with heart-shaped leaves and white or pink flowers, is unsuitable for small gardens. To raise a stock, sow seeds in a warm frame or greenhouse in spring. Further increase is effected by division in autumn or spring.

ACCELERATOR. The pedal which controls the throttle valve of the carburetter and is operated by the right foot is commonly described as the accelerator.

Widely used types of accelerator pedal are shown at A and B. A form which is comfortable and also smooth in operation is that shown at C, in which a roller on the end of the lever receives the pressure of

the foot. With this pattern the roller allows the pedal to move freely along the sole of the boot. The driver's foot can thus pivot comfortably with the heel on the footboard. This is clearly shown at D.

In a number of modern cars the accelerator pedal doubles the functions of accelerator pedal and starting switch. A coupling through a vacuum-controlled clutch is so arranged that a depression of the accelerator pedal when the engine is stopped engages| the starter motor. Directly the engine is running the vacuum-controlled clutch is disengaged and the connexion between accelerator and starter is severed. This may be known as "pedomatic" starting.



Accelerator. Types of pedal in use. A. hinged plate ; B. rocker and adjustable types ; C. roller pedal, shown in use at D.

Inventions have also been produced in which the accelerator pedal is combined with the brake pedal. The pedal may be provided with a rocking plate, moved by turning over the ankle, for opening the engine throttle, while direct pressure upon the pedal operates the brakes. Accelerator. Types of pedal in use. A. hinged plate ; B. rocker and adjustable types ; C. roller pedal, shown in use at D. Of this kind is the Smart control pedal. A foot plate at the top of the pedal is hinged so that turning of the ankle rocks it to the right and opens the throttle. Direct pressure closes the throttle and actuates the brakes.

With all types it is advisable to see that the connexions, as well as the pedal bearing, are working freely, so that the return spring brings the pedal easily to the off position ; otherwise an accident may occur through the pedal inadvertently sticking in the open throttle position. Should this happen the engine must be switched off.

ACCIDENTS. There are two senses in which the word accident is used in speech and by lawyers :
(1) An occurrence which happens neither by negligence nor design ; and (2) an untoward event which causes injury or damage, even though it may be caused by somebody's negligence or design—thus we speak of a man being injured by an accident if he is knocked down by a motorcar, though it may be the fault of the driver or the fault of the injured man himself. Householders should always insure against liability under the Workmen's Compensation Act, because under it an employer is liable to compensate a servant who meets with an accidental injury arising out of and in the course of the employment. Accidental is here used in the wide, popular sense.

For accidents caused by a person's negligence, he is responsible. For accidents caused by a wife's negligence, the husband is responsible. For accidents caused by a servant in the course of his work, the employer is responsible; for ecample, if a housemaid, cleaning the windows, negligently drops the bucket on the head of a passer-by, her master is responsible for the accident. A parent is not responsible for accidents caused by the negligence of his child-unless, of course, the child is in the parent's employ and the accident is caused by something done during the employment.

Motor-Car Accidents. Whenever an accident takes place that causes damage or injury to any person, vehicle or animal, the driver of any motor vehicle involved must stop without being called to do so, and give his name and address and that of the owner of the vehicle, together with particulars of the car, to anyone, whether a police constable or not, who has reasonable grounds for demanding the information. If any person has been injured, the certificate of insurance must also be produced. When, for any reason, the driver cannot do this, he must report the accident at a police station or to a policeconstable and (if necessary) produce his certificate of insurance within twenty-four hours, or sooner if he can. Any driver failing to comply with the law in these respects will be liable to a fine not exceeding £20 for a first offence against the Road Traffic Act, and to a fine not exceeding £50 or to three months' imprisonment for subsequent offences.

It is important to remember that notification of a road accident to the police or to some responsible person is compulsary.

No one concerned in an accident should accept any blame or make any promises of compensation. The names and addresses of any witnesses should be obtained and the official number of any police-constable present. The final position of the vehicle after the accident and any tracks on the road should be fixed by measuring the distances from the sides of the road, or from a corner or a telegraph pole. If there is any indication on the road of skidding or braking, a record should be made.

For these and other relevant facts the memory should not be relied upon; they should be jotted down at the time. It is a mistake to enter into an argument with any of the other drivers involved or with onlookers, and it is usually preferable not to make any statement—although in actual fact this advice is rarely regarded.

Accident Insurance. Insurance of this nature is a wise precaution, and is generally effected through an agent. Owners of motor-vehicles are now compelled to insure against accidents causing bodily injury to third parties. In filling up a proposal form, care should be taken in answering the questions as to age, state of health, and other matters, because if this

is not done correctly the policy will be void. It is not wise to allow the agent to fill up the form. Many cases have occurred in which agents, with an eye to commission, have filled in untrue answers, and in such cases, where the insured has signed without reading the paper carefully, it has been decided that the agent in filling up the form does so as the insured's agent; with the result that the policy is void.

When an accident brings on a disease causing incapacity, the insured is entitled to compensation under an accident policy, because there is one chain of events leading from the accident to the disablement. *See* Insurance.

Everyday Accidents. The majority of the accidents that occur in the home are preventable. Fires should never be lighted with paraffin or other inflammable liquid, owing to the risk of serious injury or even death. Gas has its dangers also if jets are not kept clean and in good working order. A blow-out in the gas oven may set a flimsy apron alight, or a lighted match in searching for an escape of gas will cause an explosion and considerable damage and injury.

Everywhere in the home where there is gas, attention should be paid to loose taps that may get turned on by accident. It is also better to leave the gas turned on at the meter all night rather than risk the asphyxiation of someone whose bedroom light has been in use when the meter tap was turned off.



Accidents in the home: a loose rug may easily cause such a mishap as this.

To use the proper utensils for the small details of cooking is a sensible way of avoiding accidents. Severe cuts, for instance, often occur through the careless use of a sharp knife for chopping suet, etc. Splitting kindling wood with a large knife or a heavy axe is not worth the danger it involves when a proper wood chopper costs only a trifling sum. Awkwardly placed pans on the stove are easily upset, with consequent scalding accidents. Similarly the spout of a boiling kettle should be turned sideways instead of towards the front of the stove.

Floor coverings are a cause of accident when insufficiently tacked down, or when slippery with too high a polish. A loose stair rail or a mat in an awkward place may cause a broken neck. Stairs should be lighted at all times.

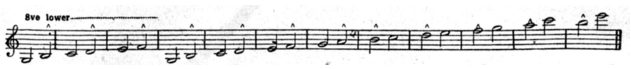
The use of a step-ladder for putting up draperies, pictures, etc., is safer than the makeshift method of using a chair perched on the top of a table. It should be ascertained that the ladder itself is quite firm before it is mounted.

Low window-sills are a serious danger. Persons who walk in their sleep have been known to step right out of a low window and fall several storeys. Children playing near such a window are only too likely to venture too far over the sill.

Lastly, there is always the danger of fire. In addition to gas and paraffin the following should be guarded against: failure to damp coal or wood fires when leaving a room; taking candles to look into a cupboard in which clothes are hanging; smoking in bed; placing a candle too near bed draperies ; and carelessly dropping glowing cigarerette ends on a carpet or in a wastepaper basket.

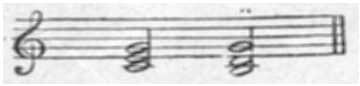
ACCORDION. Suited to the needs of those who wish to play only a simple melody, the accordion or melodeon is so constructed as to furnish an elementary accompaniment of chords. Its drawback is that it stands in one key (C) alone, and that as modulation is impossible, except by implication, the choice of music is restricted. It consists of a small pair of bellows, worked by the left hand, which also controls certain valves, viz. the wind valve (thumb), the accompaniment valve (index finger), and the bass valve (little finger).

At the other end of the bellows is a keyboard having a varying number of keys which are played by the fingers of the right hand. On being depressed these keys admit wind to the reeds, which produce one sound when the bellows are pressed in and another when they are drawn out. The compass varies according to the size of the instrument, that of the accordion with 12 keys being:

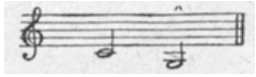


Whatever the compass, all have one feature in common : there is a diatonic succession of notes in the middle, with gaps at each end. The accordion with 21 keys has them disposed in two rows, one in G and the other in C, a simple modulation being thus possible.

In such types of accordion every C, E, and G is a pressed-in note, all the rest being drawn out. They form the tonic or key-note chord, while the others mostly belong to the dominant chord (the fifth degree of the scale). It is possible not only to play with the fingers a melody with or without a simple harmonisation, but by means of the accompaniment valve to add thereto the following chords:



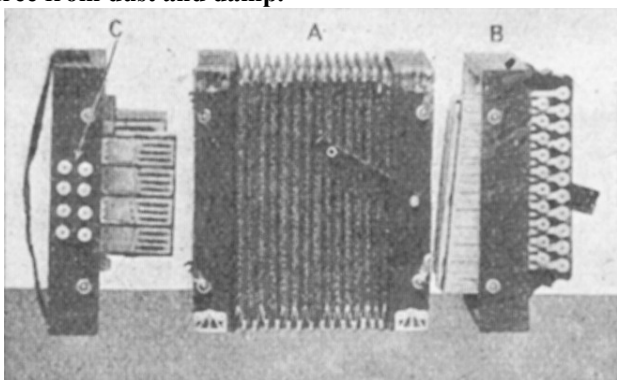
and by the bass valve these notes:



For playing, the instrument rests on the performer's knee. The bellows must first be inflated by means of the wind valve, to what extent depending on the notes required. If there is a long series of push-in notes, they may be fully inflated. The music is written on the treble staff.

The most popular and easiest accordion to play is the piano accordion, in which 5 or more keys are available. Large "multi-coupled" models (costing about £18) give a vast range of tone and modulation, and are quickly learnt by a pianist. Musical novices should use a smaller "club model" (about £5 upwards), soprano, baritone or bass.

After use an accordion should be wiped and kept free from dust and damp.



Accordion. The 21-note instrument, taken apart.
A. bellows.
B. melody keyboard.
C. valves for accompaniment, etc.

ACCOUNTS: How To Keep Them. The simplest way of keeping accounts is in a cash book ruled with three columns for the £s. d. On one side, the left, or debit, is entered all that is received, and on the other the right, or credit, all that is paid out. The amounts in cash can be added up every week or month as desired, and the balance shown compared with that which actually exists in cash. The items on the right-hand can be examined and put into classes, thus showing clearly what has been spent in a particular direction. In keeping a banking account one method is to enter all receipts and all payments, whether made in cash or by cheque, in the one account. The balance will be that of the two combined, the cash in hand and the cash at the bank. Another method is to keep two accounts, one for cash and the other for items that pass through the banking account. The cash account can than be checked by the amount of cash in hand and the other by the pass book provided by the bank.

Household accounts can be kept in an account book with the pages prepared and ruled, for a quarter or a year, as shown in the form above.

Daily amounts expended should be entered in the places intended for them, and amounts received in the spaces below. At the end of each week the accounts are made up by adding the amounts in each daily column and the amounts in each line, after which the totals of the six daily columns and the totals of the various headings should be added up. If no mistake has been made these two totals will agree. The daily total is transferred to the payment column at the bottom of the page and the amount of cash in hand ascertained and entered.

The last column on the right-hand side of the sample is provided to check expenditure more carefully. In it are entered weekly the amounts spent up to date on each housekeeping item, and also the total obtained by adding the totals for the week in question to those on the previous page of the account book. Thus at the end of any stated period the housewife can tell whether her housekeeping is costing more than it ought to do or whether any particular item is exceeding the allotted amount.

ACCOUNT STATED. When two people have accounts, one against the other, and they agree the account at so much, it is called an account stated. The account may be reopened on showing fraud or mistake, but the importance of an account stated is that it gives rise to a new cause of action, and the statute of limitations runs from the date when the account was stated.

HOUSEKEEPING ACCOUNT FOR THE WEEK ENDING SATURDAY (DATE)

Particulars	Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Total of the week	Total to date
Butcher									
Fishmonger and Poulterer									
Grocer and Cheesemonger									
Greengrocer									
Dairyman									
Laundry									
Chemist									
Repairs									
Lighting and Heating									
Sundries									
Wages and Extra Help									
Total Daily Expenses									
Cash in Hand									

RECEIPTS	£	s.	d.	PAYMENTS	£	s.	d.
Monday				Monday			
Tuesday				Tuesday			
Wednesday				Wednesday			
Thursday				Thursday			
Friday				Friday			
Saturday				Saturday			
Total				Total			
Cash in hand last Saturday				Cash in hand			

ACCUMULATOR. Electric accumulators are employed for providing electric light and to a less extent for traction, as in electric carriages and motor launches. The accumulator is an indispensable adjunct of the small, self-contained electric-lighting plant. On motor-cycles accumulators are used for lighting; and on cars for lighting and for the electric starter, horn, and other devices. As a source of low tension and, to a less extent, of high tension current, the accumulator is also used in wireless sets.

An electric accumulator, known also as a secondary battery and as a storage battery, differs from the primary electric cell in that the accumulator does not generate energy, but is charged by sending an electric current through the cell from an outside source.



When mixing electrolyte for the accumulator, acid must be added to the water (not water to acid) very slowly and stirred.

The lead-acid type of accumulator in common use consists of a rectangular container of glass, celluloid, etc., in which are a number of grid-like lead plates, grouped into positive and negative elements. The plates are immersed in an electrolyte consisting of sulphuric acid in distilled water. The interstices of the grids are filled with a preparation of lead, and the plates are kept from touching by spacers of some non-conducting material. The positive and negative plates alternate, all the positive and all the negative grids being coupled.



Accumulator. The state of the battery should be tested with the hydrometer, and distilled water added if the plates are not well covered.

When a suitable electric current is sent through such a cell, hydrogen passes from the anode or positive plate, which is said thus to become peroxidised, to the other plate—the cathode or negative—where it combines with some of the oxygen of that plate, which thus becomes reduced. This chemical change is the measure of energy put into the cell and stored. The plates will remain in this charged condition for some time, though they will gradually run down if left alone; but if the terminals of the cell be connected outside, chemical action restarts in the opposite direction, the hydrogen removed from the one plate returns, and an electric current passes through the connexion in the opposite direction to that in which the current entered the cell. The cell is thus discharged. These operations of charging and discharging may be repeated indefinitely. In discharging the electricity put into the accumulator (stored) is utilised.

While essentially simple, accumulators require careful attention. The most serious trouble arises from sulphating. The sulphate is a white scale which forms on the plates and renders them useless. Sulphating may arise from over-discharging, running down the battery below the limit voltage ; by leaving the battery discharged for a time, or from too strong a solution. If not too bad the scale may be scraped off the plates, and by slow and careful charging proper conditions may be restored. If badly scaled the plates may become buckled or the preparations dis-integrated, necessitating renewal of the plates. Any acid which may be spilled from the vents should be wiped off carefully, and the terminals should be coated with petroleum jelly to prevent corrosion.

New accumulators are generally sent out dry, i.e. without the electrolyte. Follow the maker's instructions carefully as to rate of charging, specific gravity of electrolyte, etc.

If it is necessary to prepare acid of the required strength, the strong acid should be slowly added to the distilled water, stirring it in a little at a time. Never, in any circumstances, add water to the acid.

Care must be taken not to spill the acid on the hands, clothes, or on any fabric.

If acid touches the fabric it will be definitely marked, and will be completely destroyed unless the acid is washed off immediately.

Ammonia water will neutralise the acid, and should be available, particularly where strong sulphuric acid is being used.

Accumulators are made up of two-volt units, usually separate, although two or more cells may be housed in a single outer container. The voltage of lead-acid cells is about 2, but increases to 2·2 when fully charged. A six-volt lead accumulator thus contains 3 cells and a twelve-volt 6 cells.

The number and size of the plates in the cell does not affect the voltage, but governs the output or amperage. The effective capacity of an accumulator thus depends upon the plate area exposed to the electrolyte.

The electrolyte in the cell should cover the plates. Any loss caused by evaporation must be made good by adding distilled (not tap) water until the electrolyte is at least half an inch above the top of the plates. The best time to do this is just before charging, as the charging process facilitates the mixing of the water and acid. Vent holes should always be clear so as to allow gas to escape.

The specific gravity of the cells can be tested with a hydrometer. A handy type of apparatus comprises an outer tube into which a small quantity of the liquid may be withdrawn by compressing a rubber bulb at the top of the tube. Inside the tube is the hydrometer proper, which floats in the liquid. After testing, the electrolyte is returned to the accumulator. The table in the next page gives average readings for an accumulator in different states of charge or discharge. The hydrometer should be used in conjunction with a voltmeter.

Condition of Cell.	Sp. Gravity.
Fully charged	1·285
Half discharged	1·245
Fully discharged	1·190

The voltage of a cell should not be allowed to fall below 1·85. On charging, the voltage rises to about 2·2. It is useful to remember, in connecting cells together, that joining them in series adds voltage, and that connecting them in parallel adds amperage.

ACETIC ACID. The acid principle of vinegar is acetic acid, of which vinegar contains six to twelve per cent. The kinds and strengths of acetic acid are:

Pyroligneous Acid. A crude form sold as Essence of Smoke to flavour bacon and dried fish. It is applied with a brush on the meat or fish and adds colour as well as flavour.

Glacial Acetic Acid. So-called because in cold weather it solidifies and becomes like ice. It consists of pure acetic acid, burns the skin if applied freely, and has a pungent smell. When perfumed it forms aromatic vinegar, used to wet the sponge with which vinaigrette bottles are filled. The formula is as follows:

Lavender oil	40 drops
Clove oil	40 drops
Lemon oil	40 drops
Bergamot oil	20 drops
Cinnamon oil	10 drops
Neroli oil	5 drops
Glacial acetic acid	1 fluid oz.

Another preparation containing glacial acetic acid is toilet vinegar (q.v.).

Glacial acetic acid is used for warts, applied once a day with a small camel-hair brush. The skin round the wart is smeared with vaseline to prevent burning the sound skin.

Ordinary Acetic Acid. This contains a third of its weight of acetic acid and is used as a pickling vinegar where the colour of ordinary malt vinegar is an objection. One part of acetic acid mixed with four parts of water forms white vinegar, which is suitable for pickling vegetables.

To make spiced vinegar, boil for 10 min. the following bruised spices in a gallon of white vinegar:

Jamaica ginger	1 oz.
Pimento (allspice)	1 oz.
Long pepper	3 oz.
Black pepper	3 oz.
Mustard seed	1 lb.

Two tablespoonfuls of dilute acetic acid in a pint of water makes a useful lotion for dabbing on an itching skin, provided there is no inflammation or broken skin. It is also useful as a cold application to the forehead for headache or for sponging fevered patients.

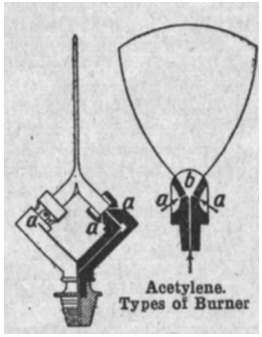
Acetic acid is used for making raspberry vinegar (q.v.). *See* Vinegar.

ACETYLENE. Carbide of calcium when excess brought into contact with water produces acetylene gas, which is used by motor cyclists for lighting when their machines are without electrical equipment. Under normal conditions one pound of carbide generates 180 litres, or 6 cubic feet, of gas. This quantity will supply gas for about 8 hours to a burner passing from 20 to 24 litres per hour.

Acetylene is a colourless gas, and when pure has a rather agreeable odour, but it usually contains impurities which give it a distinctive disagreeable smell. The gas will explode with great violence when mixed with oxygen or even air in any proportion from 3 p.c. to 83 p.c. It is not poisonous in small quantities, and burns with a white flame.

Acetylene lighting is obsolete on cars and has been almost entirely superseded by electricity on commercial vehicles and motor cycles.

Burners for acetylene gas are illustrated in the diagram. They utilise the Bunsen principle, the aim being to get as much air as possible to the gas at the point of issue from the burner; *a, a*, are air passages, and *b* the gas outlet. When burning properly, acetylene light is exceedingly white and brilliant; colours and shades appear the same as by daylight.



At one time acetylene gas was fairly widely used for country-house lighting, a water fed automatic gas-making plant being installed in an outhouse specially built for the purpose. The disadvantages associated with control of water supply, the smell of the gas if leakage or burner failure occurred, and other difficulties have caused it to be displaced by air gas (petrol gas) and other systems. *See* Air Gas; Gas; Electric Lighting, etc.

ACHILLEA. Both for borders and the rockery the achillea or milfoil (q.v.) is useful, Millefolium, ptarmica and tournefortii are three good species for borders. The most popular is the double Pearl, producing white flowers in summer and much esteemed for cutting. For rockeries the best are the white-flowering clavennae and tomentosa. The achilleas can be raised from seed, and thrive in plain soil. Pron. Ak-i-lee'-a.

ACID. Acids are of two classes: organic, and inorganic or mineral acids. Instances of organic acids are acetic, carbolic, citric, gallic, lactic, salicylic, tannic, and tartaric; and of mineral acids, boracic (or boric), hydrochloric, sulphuric, and sulphurous. *See* Acetic Acid; Boracic Acid; Fertiliser; Prussic Acid, etc.

ACID DROPS. Boil 1½ lb. loaf sugar, ½ pint water and ½ teaspoonfull of cream of tartar together until mixture turns a pale yellow, then add essence of lemon to taste and turn out on to oiled slab. Sprinkle preparation with one dessert-spoonful tartaric acid, work thoroughly in, and when sufficiently cool to touch form into thin rolls. Cut off small pieces with scissors and roll to shape by hand. Sift with sugar and dry before placing in tin.

ACIDITY. Term for excess of acid, usually organic acid, in the stomach, in certain kinds of

dyspepsia (q.v.). Where this exists, with occasional risings of sour, bitter material in the back of the throat, the following mixture often gives relief:

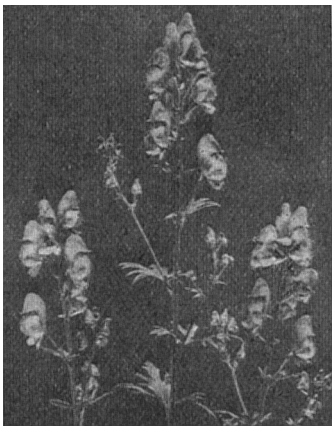
Bismuth oxycarbonate	2 drains
Sodium bicarbonate	1 ½ „
Mucilage of tragacanth	1 ounce
Peppermint water enough to make	8 ounces

Take two tablespoonfuls half an hour to one hour after a meal. *See* Diet; Indigestion.

ACID STAINS: Their Removal. Stains, as from sulphuric or hydrochloric acid, can usually be removed by washing the stained part with a solution of ammonia. Strong acids burn all fabric and must be washed off with ammonia or other alkaline solution (such as washing soda) at once if destruction of the surface is to be avoided. Some marking is almost unavoidable. Spots of acid on serge or blue cloth will cause red marks, which disappear if neutralized by ammonia while still wet. A strong solution of ammonia may remove many old acid stains as well, though not generally effective, as the material and dye are oxidised, especially by nitric acid. *See* Ammonia; Stain.

ACNE. This is a chronic skin disease characterised by pimples, blotches, blackheads, and a greasy skin, on the chin, forehead, shoulders and back. In another form of it, acne rosacea, a prominent symptom is a chronically inflamed, reddened nose. *See* Blackhead; Nose; Pimple.

ACONITE. There are numerous species of aconite, which belongs to the buttercup family. They are all poisonous, the roots bearing some resemblance to horseradish. The common monkshood is Aconitum Napellus, a British native which favours shade near water. Besides the blues, there are several varieties bearing pale yellow flowers, like lycoctonum which is the wolfsbane, anthora and pyrenaicum, all summer bloomers. The winter aconite (Eranthis) does well in shade, and is often grown under trees, its clear yellow cups on their green Toby frills appearing in January.





Right. Aconite. Seed pods and blue flowers of monkshood, a variety of Aconite. (Photo, Malby).

Left. Aconite. This root yields a deadly drug.

Aconite root has been mistaken for horse radish, with fatal consequences.

Horseradish is a pale yellowish colour outside, whitish inside; aconite root is a dark brown colour outside, whitish inside. Horseradish is cylindrical in shape, aconite conical.

In medicine aconite is a powerful poison, sometimes prescribed to slow the action of the heart. The symptoms of poisoning are severe vomiting, an icy wet skin, complete prostration, accompanied by a very slow, often irregular, pulse. See Monkshood; Poisoning.

ACRE. A land measure containing 4,840 sq. yards, divided into four roods each of 1,210 sq. yards. In addition to this imperial acre, acres of other sizes are occasionally used in various parts of the United Kingdom, among such being the Scottish and Westmorland acres.

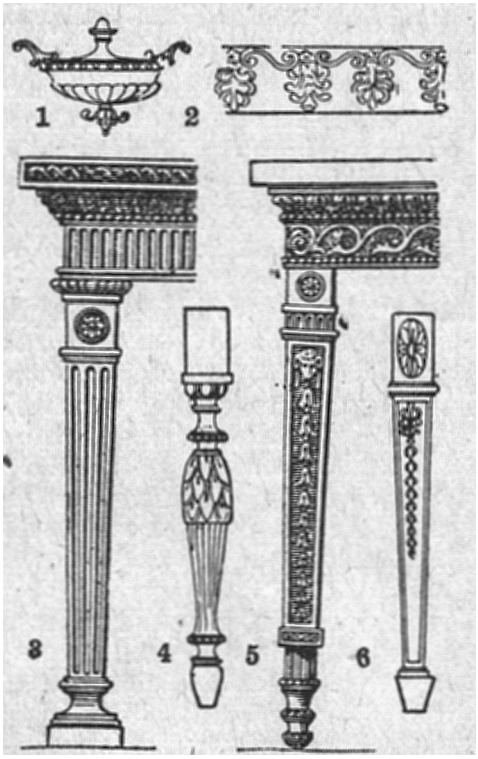
ADAM STYLE: In Furniture. The brothers Robert and James Adam were architects, famous as designers of buildings in London and the country during the latter half of the 18th century. They designed furniture and decorations to harmonise with these.

Their style was based upon the lighter details of the classic orders (Doric, Ionic, Corinthian, etc.). Swags, festoons flowers, lutes, paterae (round and oval ornaments), festoons of drapery, mythical figures, husks, the vase and urn, key borders, and rams' heads, honeysuckle and acanthus, dentil and egg-and-tongue are the prominent features found in all Adam work. Much of the furniture was painted, though made of mahogany, and Wedgwood plaques were often inserted as panels. Many of the original Adam drawings are in the Soane Museum, Lincoln's Inn Fields (London), and specimens of the furniture at South Kensington. Fig. 1 shows the urn motif, Fig. 2 the honeysuckle ornament, both frequent in Adam decoration. Figs. 3, 4, 5 and 6 show the characteristic table legs, round, tapered or square, carved and fluted. Fig. 7 is a chair-back with rams' heads, key pattern and honeysuckle on the splat and husks in low relief carved all round the frame.



Adam Style. Fireplace with an Adam grate and mantelpiece taken from an old house and readily adapted to a new one.

The photograph of the grate above has an almost familiar present-day look owing to the extent to which Adam designs have influenced modern decoration in this direction. From about 1775 Robert Adam did much to develop painted and inlaid satinwood

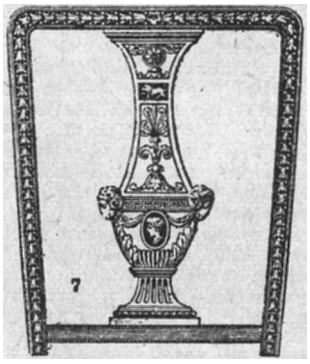


Adam Style. Details of decoration typical of this style. See Text.

furniture, which then became the fashion. He also designed some pieces in lacquer. The typical Adam ceiling has complicated mouldings of festoons, ovals and medallions.

R. and J. Adam were really the last designers to create a characteristic British style which has lived.

S e e Anaglypta; Antique Furniture; Chair; Chimney Piece, etc.



Chair back, ornamented with Adam patterns on splat and frame

ADDER BITES: How to Treat. The bites of the variety of adder found in Great Britain are rarely fatal except in children and debilitated persons. There may be a burning pain at the site of the puncture, but the accident may not be noticed, and the first warning may be the onset of the general symptoms, which are prostration, with perhaps vomiting and diarrhoea, the skin being covered with a clammy sweat ; and the person may possibly become unconscious. The doctor should be sent for and told the nature of the accident at the time of summoning, so that he may bring with him such remedies as he may require.

A ligature (q.v.) should be applied round the limb above the wound to prevent the poison entering the system, or any more of it if general symptoms have actually manifested themselves.

The bite should be thoroughly sucked, and no fear need be entertained of evil consequences, as there is no danger in sucking if there are no broken surfaces on the lips or mouth. The mouth should be rinsed out with water or spirits, if any are available. Any bleeding should be encouraged.

Meanwhile the patient is kept warm, and the limbs may be chafed for this purpose. Stimulants should be given, spirits, sal volatile in teaspoonful doses in water, or hot tea. It is necessary to keep the patient cheerful. The wound will subsequently need to be kept covered with an antiseptic dressing.

ADDER'S TONGUE.

This dwarf-growing fern is grown at its best in the partially shaded section of the rock garden, and likes a moist, loamy soil. It may be planted or transplanted at any time during the spring or summer months, and may be propagated by putting spore-laden fronds in a cold frame towards the end of summer. It was once largely used in window fern boxes.

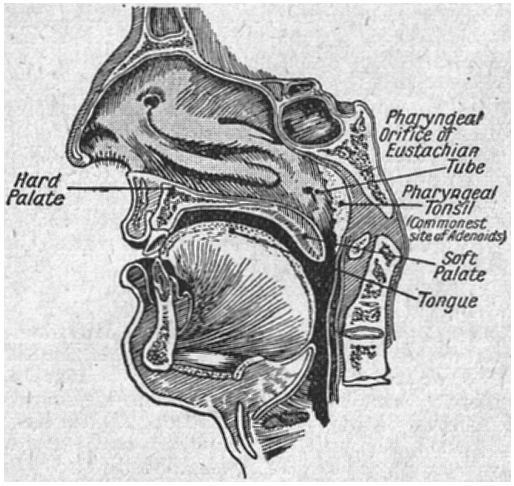


Adder's Tongue. Dwarf fern.

ADENOIDS: CURE AND AFTER TREATMENT

How these Troublesome Growths may be Detected and their Consequences Prevented.

See **further under Breathing; Nose; Throat; Tonsils, etc.**



Adenoids. Section of the mouth and nasal cavities showing the common site of the growths

An overgrowth of lymphoid tissue called an adenoid is often to be found in children at the back of the nose on the vault of the nasopharynx. This lymphoid tissue is similar to that of which the tonsils are largely composed and is present in every body. It is the overgrowth of this tissue in the shape of small bosses or finger-like processes which constitutes adenoids. These processes may be soft and friable, or may be tough and firmly attached. Adenoids are usually associated with enlarged tonsils.

From their position they more or less block up the air

passage between the nose and throat, making it difficult or impossible to breathe through the nose. They may obstruct the opening of the Eustachian tubes, which lead from the throat to the ears, and thus cause deafness and perhaps earache.

Adenoids may be noticed shortly after birth, but are most common between the ages of 3 and 10. In infancy, because the blocking up of the nostrils causes difficulty in breathing, suckling may be seriously interfered with, and the nutrition of the child suffer in consequence. When the child is somewhat older say, perhaps 3 or 4, it may suffer from a constant "wet nose," and the discharge may contain pus or be tinged with blood; the mouth is always open, and it will be found that the child always breathes through the mouth.

The cavity of the nose is so constructed that it warms, moistens and cleanses the air, but when the air passes through a large cavity like the mouth, which is always swarming with microbes, it is neither cleansed nor warmed. The result is that the child with adenoids is liable to suffer from catarrh of the throat and air tubes, and an irritating cough is frequently present. The voice tends to become thick and nasal in quality, and snoring at night is usual. Deafness is very common, and infec-tion may extend into the ear.

If the condition is not relieved, the face assumes a characteristic appearance, with a compressed nose and prominent upper teeth, like a rabbit. Owing to the difficulty in taking sufficient air into the lungs the chest may become deformed, flattened from before backward, or from side to side, with a prominent breastbone—the so-called pigeon breast. The liability of such a person to contract tuberculosis of the lungs is notorious. Sleep is apt to be disturbed, and while awake the child may be peevish and irritable. The expression is often dull and stupid, and the child may be inattentive at school, so that the mental development is retarded.

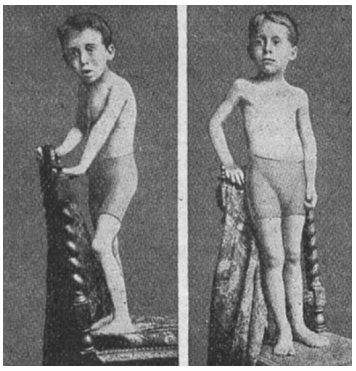
Treatment of adenoids is a matter of controversy. If they are small and recent, if they are only swollen because of inflammation, it is possible that the procedures which we shall mention in connexion with the treatment necessary after operation may do good. They should not, however, be persisted in too long. But when the adenoids are actual overgrowths, and perhaps tough growths, operation is the only treatment, and it should be performed without delay. It is usually also necessary to remove the whole or part of the tonsils at the same time. The operation is simple.

It must be remembered that failure to carry out the after treatment is responsible for any incompleteness in cure.

The child should be supervised in (1) clearing out the nose by blowing it twice a day; and (2) in performing simple exercises with the mouth shut. This treatment should be commenced a week or ten days after the operation. In clearing the nose the child should stand erect and grasp the nose with the right hand across the bridge, not on the compressible part. It should then take a deep breath through the nose and finally blow down forcibly into a piece of soft paper held in the left hand. This is repeated several times. In blowing the nose only one nostril at a time should be compressed. Compressing both at once may result in forcing infectious material into the ears.

With regard to the exercises, a simple one is to make the child stand erect and stoop about 10 or 12 times a minute. The mouth must be shut, and the child breathes out in descending and in when raising the body. The exercises should be performed, if possible, in the open air, and should be continued for at least four or five months. The tendency to sleep with the mouth open may persist, and it may be necessary to bandage up the lower jaw to prevent this.

After complete recovery from the operation the patient's health should be built up in every way possible by plenty of outdoor exercise, plain, nourishing food, long hours of sleep and freedom from school if necessary. A month at the seaside or in the country will often work wonders in these cases.



Adenoids. Left boy showing typical symptoms of adenoids; right, seven months after their removal

ADHESIVE PLASTER.

A mixture of resin, lead plaster, and hard soap, melted together and spread on strips of linen, are the components of an adhesive plaster. Another form, which has a rubber basis, Mead's plaster, is obtainable in various widths, and does not require warming before application. These plasters are useful for bringing the edges of a wound together, and for strapping on dressings. They are sometimes used round boils to protect the surrounding skin from infection. A hole is cut in the centre to permit of the discharge escaping.

ADMINISTRATION, LETTERS OF.

When a man dies without a will, before his money or property can be dealt with someone must take out letters of administration. England is divided into districts, and the proper thing to do is to apply at the registry of the district where the deceased resided. The following is a list of the towns where the district registries are situated:

Group 1. Newcastle, Durham, Carlisle. Group 2. Leeds, Sheffield, York. Group 3. Manchester. Group 4. Liverpool, Lancaster. Group 5. Chester, with sub-registries at Bangor and Shrewsbury. Group 6. Lincoln, Nottingham, Leicester, with a sub-registry at Derby. Group 7. Peterborough, Norwich, Ipswich. Group 8. Birmingham and Oxford, with a sub-registry at Northampton. Group 9. Cardiff, with sub-registries at Hereford, Gloucester, and Carmarthen. Group 10. Bristol and Exeter, with a sub-registry at Bodmin. Group 11. Southampton and Lewes, with a sub-registry at Salisbury.

In any other part of the country, or when the deceased lived abroad, application should be made to the Principal Probate Registry at Somerset House. Strand, London.

The widow or widower is the first person entitled to take out letters of administration, and then the children. Failing children, a grandchild; failing descendants, a parent, brother, sister, nephew, niece, grand parent, uncle, aunt, cousin, the Crown, and creditors—in that order The registry supplies forms to fill in, and explains where to swear the necessary affidavit; but unless the estate is a very small one indeed it is generally advisable to entrust the business to a solicitor. *See* Executor; Will.

ADOPTION: The Legal Aspect. Not until 1926 in England and 1930 in Scotland was it made legally possible for an adult to adopt a child under 21 so as to exclude the rights of the natural parents.

An adoption order must be obtained from the court and the case will be heard in camera. The adopting person must not be under 25 nor, except where the parties are related, less than 21 years older than the child to be adopted. No male person can adopt a female child as sole adopter except in special circumstances. The consent of the parent or guardian of the child must be obtained to any adoption before an order will be made. A husband and wife may adopt jointly or one of them may adopt alone, but in that case the consent of the other must be obtained unless they are living apart. Money may be given for the adoption, but this must be sanctioned by the court.

The adopting parent has the same rights over the adopted child as over his own children as to custody, maintenance, and education. The adopted child does not lose any rights it may have of succeeding to property through its natural parents, nor does it acquire any right to succeed to property as the child of its adopting parent. A special register is kept of adopted children at Somerset House, London, W.C.

ADULTERATION OF FOOD. The different kinds of adulteration may be classed under the following headings:

The mixing of a cheaper substance with a more expensive one, the mixture being sold under the title of the latter constituent. Examples of this are glucose and sugar, sold as sugar, or chicory and coffee as coffee.

The addition of worthless substances fraudulently to increase the bulk, such as the addition of coarsely ground shells of fruit stones to pepper and spices, dilution of milk with water.

The addition of preservatives to delay putrefaction and conceal the use of stale food. This, however, is allowed by law in particular cases, and under certain conditions.

The addition of artificial colouring matters, allowed in some cases.

Anyone who suspects that food or drink supplied has been adulterated should interview the medical officer of health of the district. Any private purchaser may submit a sample to the public analyst, who must analyse it and report on payment of 10s. 6d.

Any medical officer, sanitary inspector, inspector of markets, inspector of weights and measures, or police constable acting on the instruction of the local authority can compel any retail trader to sell him a sample of food exposed for sale. Samples may also be taken in the course of delivery, with the consent or at the request of the purchaser. In the case of milk no consent or request is required. *See* Food; Preservatives.

ADZE. This is an edged tool having a curved blade set at right angles to the handle, so that the cutting stroke is always towards the worker. It is used principally for rough planing timber. The tool is extremely dangerous for an amateur to use.



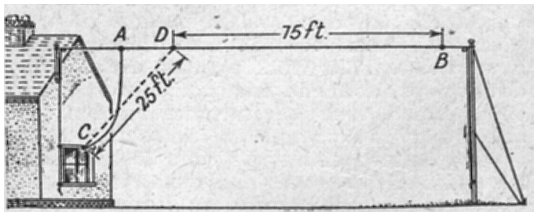
Adze used for smoothing a plank. It is a very dangerous tool

AERATED WATERS. Certain kinds of mineral waters which have had carbonic acid gas dissolved in them under pressure. Small quantities can be made with the aid of a gasogene or seltzogene, and the steel capsules sold at chemists' containing carbonic acid gas under pressure. If pure water is used in the gasogene the product is simply mineral water. For soda water dissolve 80 grains of sodium bicarbonate to the gallon; for lithia water 80 grains of lithium carbonate ; for potash water 32 to 64 grains of potassium bicarbonate; and for seltzer water 80 to 160 grains of a mixture of chloride, bicarbonate, sulphate and phosphate of sodium, all to the gallon. Lemonade and similar aerated waters merely require the necessary flavouring agents to be added. *See* Mineral Waters; Soda Water.

AERIAL: How to Erect. In erecting a broadcast receiving aerial it is necessary to bear in mind the limitations imposed by the P.M.G. The combined height and length must not exceed 100 feet. Thus an "L" aerial with a 75 feet horizontal span and a downlead of 25 feet would be permissible. An aerial which crosses above or is liable to fall upon or to be blown on to any overhead power wire (including electric lighting and tramway wires) must be guarded to the reasonable satisfaction of the owner of the power wire concerned. With present-day broadcasting conditions it is not always necessary to use an aerial of the full length allowed, and greater selectivity may be obtained in many cases with a shorter one.

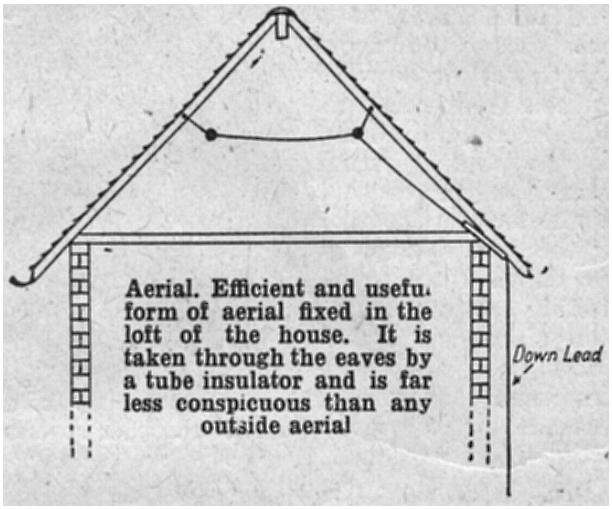
The inverted "L" aerial gives good results and is in the main the easiest to erect. It will be assumed that the aerial is to be attached at one end to the house, e.g. to a chimney stack, and supported at the other by means of a mast.

A straight, sound, scaffold pole 30 feet long may be



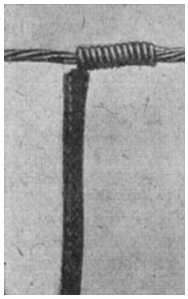
Aerial. Layout of a broadcast receiving aerial of the inverted L type. Take down lead from D to C if possible, instead of usual A to C.

used; it can be painted and the lower end tarred. For foundation place it on a square of York stone, let 2 to 3 feet into the ground. The side of the hole on which the pull of the aerial will come should be vertical. To the pole must be fixed 8 guy wires for holding it in an upright position. This wire should be about 7·32 S.W.G. galvanised steel wire. Cut suitable lengths and seize four of them round the pole about a foot from the top and four more half way up its length. Anchor the guy wires by fastening them to stout stakes driven into the ground. A good anchorage may be made of a stout iron bar formed into an eye at the top end and bent over at an angle at the lower end. This is embedded in a mass of wet concrete in a hole. Before proceeding to erect a pole, fasten a pulley-block to the top threaded with the halliard or rope for running the aerial up and down. The halliard must be made endless by joining up the ends. Help will be necessary for erection of the pole.



Put the foot of the mast into its foundations, and while one person lifts two others should be pulling on the opposite guy. When the pole begins to go up, the side guys must be laid hold of to steady the lift, and as the mast assumes the vertical the person lifting should lay hold of the remaining guys. The mast erect, roughly fix the top outer guys and then shovel earth into the hole to the depth of a foot or so, ramming it in hard. Then the pole can be straightened up by the guys. After this, fasten the inside centre guys, which, having trimmed, slack off and trim the outer guys. The filling-in can then be completed.

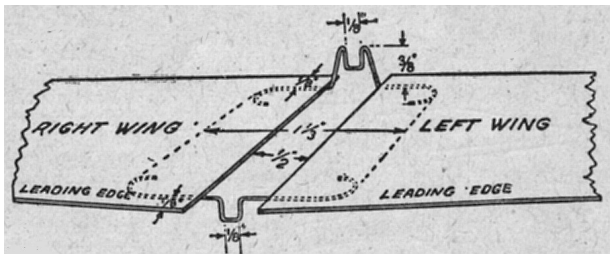
The next thing is to erect the house-end fixture. If there is a convenient chimney a galvanised iron strap may be fixed round it to take the aerial; a pulley-block should be attached to the strap, and the halliard or suspending rope passed through this. Care must be taken that the strap is kept below a third of the total height of the stack, or in stormy weather there is a danger of the stack being pulled over. Do not attempt to hammer or screw a fastening into the brickwork. The landlord's permission may be needed for any fixture of this kind.



Aerial. Method of joining lead-in.

The aerial wire should be stranded hard drawn copper wire 7·22 to 7·25 S.W.G. Run it out on the ground, taking care to avoid kinks, loops, etc. Fix a shell insulator to the mast end of the wire, and, judging the amount required for loading in, fix an insulator into the wire at the point where the aerial will leave off, and the leading-in wire or down-lead commence. Where the aerial lead is to enter the house a proper lead-in tube should be fixed. The lead-in should be kept at least 4 ft. away from walls or trees. Hoist up the aerial, but do not draw it too taut, as wind and wet may cause too great a strain. Every three months the stay wires must be examined, and, if necessary, adjusted. Insulators should be cleaned and dried periodically. Nothing is gained in broadcast reception by using aerials with more than one wire, except qf course, in the cage type, which is useful in confined spaces.

AEROPLANE: Making a Model. The actual making of model aeroplanes is simple. The main consideration is lightness, and strength of construction has to be sacrificed to achieve this. An illustration is given of a popular and simple type of model. The fuselage consists of a single spar of balsa wood, with wings and tail unit of the same ultra-light material. Motive power is provided by a couple of strands of aeroplane elastic.

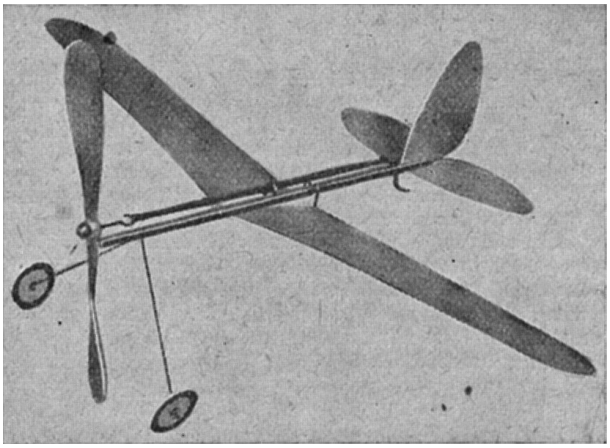


Details of the inner wing attachment, showing the wing clips and the dimensions recommended.

The shaping of the propeller is the most difficult piece of work. The wood has to be soaked in boiling water and twisted carefully at each end to the required pitch. When fashioning the wings, care must be taken that they are of exactly the same dimensions and thickness. Generally speaking, the thinner and smoother the wing surface, the better the model will fly. The rudder and each half of the tailplane are

of identical size and shape. The wings should be soaked like the propeller and twisted from front to rear to give a cambered surface.

While the wings are drying, take the spar to which wings, tail and elastic are to be attached. Sandpaper this all over and taper the extreme tail. Then make a shallow cut along the tapered portion, sandpaper the base of the rudder and insert the latter in the cut, using special cement to fix it firmly. The two halves of the tailplane can then be cemented together and fixed on the spar at right angles to the rudder.



Aeroplane Model. The lower photograph shows the completed model, directions lor the construction of which are included in the article on this page.

A two-foot length of piano wire provides all that is necessary to make the wire parts of the models. These include the spindle for the propeller bearing, the two under-carriage legs (bent out at the foot to form axles), a clip to hold the elastic down over the centre of the fuselage, a swivelling bracket-cum-skid as rear attachment for the elastic and the wing clips, of which more is said later.

The wheels are made from a piece of stiff card. A paper tube through the centre of each wheel will act as a bearing, and a piece of thread wound round it and cemented will prevent the wheels falling off.

The propeller should now be cut exactly in half, and the two halves cemented into a notch on a central wooden hub. Insert the propeller spindle in the notch, with two brass washers between the wire loop and the blades.

The wire wing clips are bent into shape and cemented into position about i in. from each edge of the wings *(see* Fig.). When these have completely dried, bend the clips again very carefully to give the entire wing unit a slight dihedral angle, so that the wing-tips are higher than the centre section. The wings are then clipped to the spar, the elastic is attached to the brackets at the nose and tail, and the model is complete.

AFFILIATION ORDER. Any single woman, or married woman living apart from her husband, who has an illegitimate child may obtain an order at the police court against the father for the payment of a sum not exceeding 20s. a week until the child is 13 or in special cases 16, and of a further sum for the expenses of her confinement. Application may be made before the child is born and must be made within 12 months after the birth, unless it can be proved that the alleged father paid money for the maintenance of the child within 12 months of the birth, in which case the application may be made at any time. Where the alleged father went abroad within 12 months of the birth, the application may be made within 12 months of his return.

The evidence of the mother as to the paternity must be corroborated by some other evidence, such, for example, as some statement or the behaviour of the alleged father.

AFRICAN LILY. A native of South Africa, the African Lily, or Agapanthus, has long, sword-shaped leaves and beautiful blue flowers, the latter being borne on a stem about 3 ft. in height. There is a single species, umbellatus, also several varieties including whites, and a double form. It is usually grown in small tubs or large pots, which may be placed outside in the summer, and is propagated by suckers. A fairly rich compost is necessary, preferably three parts of old turf, one part of decayed cow manure, one of leaf-mould and a fair proportion of sand.



African Lily. Blue flowers of this large pot plant.

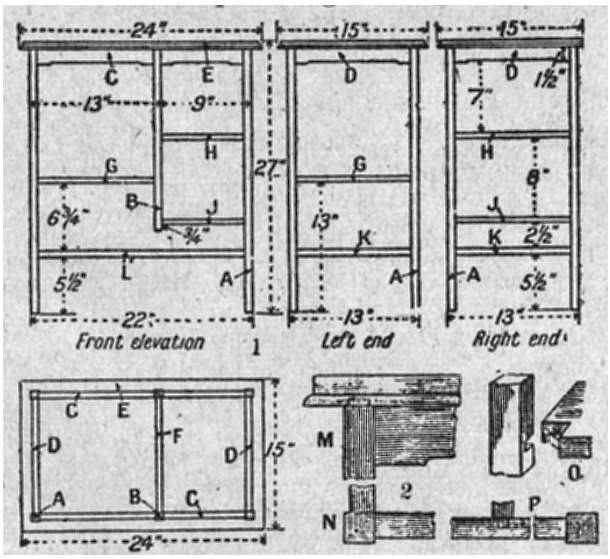
AFTERNOON TEA TABLE. This light tea table is designed on Japanese lines. The framework is of the slightest consistent with strength.

The legs are ¾ in. square throughout their length. They are cut with stub tenons to enter the top, mortised for the rails as they occur, and notched for the shelves, two at the right-hand side and one at the left. The sizes are given in Fig. 1. The top rails are tenoned to the legs, and the two longer ones (C) may be bridle-jointed to the intermediate uprights (B), which are ¾ in. square.



Afternoon Tea Table, the making of which is described in the text

The table top may be in one piece finishing ⅝ in. thick. It overhangs an inch at each side, and is held by thumb-screwing through the rails and by glue-blocking. The middle uprights project ¾ in. below the bottom shelf.



Afternoon Tea Table. Fig. 1. Sectional plan, front and end elevations; for lettering see cutting list. Fig. 2 (bottom, right). Principal joints: M, top, leg and rail; N, section of leg and rails; 0. notched shelf; P, lower rail joints.

Lower rails may be arranged as shown in the perspective sketch, or two cross rails (Fig. 1, K) and one central stretcher rail (L) only may be fixed. The rails, ¾ in. by ½ in. in section, will be tenoned to the legs, the stretcher rail being tenoned to the two cross rails (Fig. 2, P). The shelves are notched to the legs and uprights *(see.* Fig. 2, 0). Each shelf may be strengthened by screwing a steel picture eye (angle-wise) into the leg immediately below the shelf. The shell finds an additional bearing on this, and may be screwed through the picture eye from below.

	Long in.	Wide in.	Thick in.
4 legs (A)	26½	¾	¾
2 uprights (B)	19	¾	¾
2 top rails (C)	22	1½	⅝
2 end rails (D)	13	1½	⅝
Top (E)	24	15	¾
Stiffening top rail (F)	13	1½	⅝
Left hand shelf (G)	13	13	½
Right hand shelf (H)	13	10	½
Ditto (J)	13	10	½
2 cross rails (K)	13	¾	½
Stretcher rail (L)	22	¾	½

Oak, walnut, or mahogany may be used for the table. The wood should be thoroughly sound and free from knots. A cutting list is given above; the lengths quoted allow for joints and paring, but all thicknesses are intended to be net finished sizes.

AGAVE. With its large, succulent, shiny leaves, and big trusses of greenish-yellow funnel-shaped flowers, borne on tall spikes, this plant is frequently grown in large pots or tubs. It blooms but rarely, and grows slowly. It needs little attention, and is able to withstand a great amount of drought and hot sun. The best known species is Americana, the American aloe, which attains an imposing size, and is grown out of doors.

Agave. Succulent plant suitable for growing in pots and tubs.



Two varieties often grown are picta and variegata, both with variegated leaves. Other good sorts are filamentosa and Sartori. A suitable compost is composed of three parts loam, one part leaf-mould, and one part decayed hotbed manure, with sand. To propagate the plant, pot up the small suckers which form at the base, and grow them on. During hot weather the agave needs copious supplies of water. Pron. A-gay'-vi.

AGERATUM. While not fastidious in the matter of soil, the ageratum prefers a dry but gritty soil to a stiff, damp medium. If put out in May the plants flower from Jane till October. The dwarf garden forms of the species Mexicanum may be used as bedding plants. Such sorts as Imperial Dwarf Blue, Countess of Stair, Swanley Blue, and Heavenly Blue, with slate blue flowers from May to September, are commonly grown as annuals. Pron. Aj-er-ray'-tum.

AGREEMENTS. Before any agreement will be enforced by English law there most be present what the law calls " consideration," or else the agreement most be made by a deed—i.e. a document under seal " Consideration " in an agreement means that one party to the agreement is promising to do something in consideration of the other party promising to do or to forbear to do something else.

Agreements are created by an offer made by one party and the acceptance of it by the other. The acceptance must be in exactly the same terms as the offer. For example, if a man offers to buy some boots from another and stipulates the exact quantity and quality and price, and also that delivery must be on a certain day, and the other replies, agreeing to all the terms except the date of delivery, there is no completed agreement, as the offer and acceptance differ on this one point. What purports to be acceptance is really another offer.

Agreements may take any one of three forms. They may be by deed under seal—in which case we have seen they require no consideration—in writing, or by

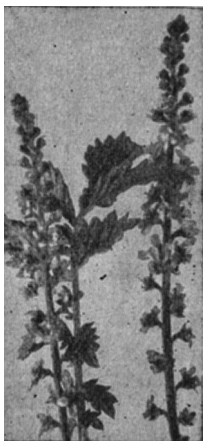
word of mouth. A transfer of shares in a company or a lease for more than 3 years (but not a mere "agreement for a lease") must be by deed. The following agreements must be evidenced by some written document. (1) guarantees; (2) agreements for the sale of land; (3) agreements by executors to be personally liable for the debts of the estate; (4) agreements in consideration of marriage; (5) agreements which cannot be performed within a year of the date on which they are made; (6) agreements for the sale of goods, over £10 in value, unless some of the goods have been accepted by the buyer or some money has been paid, where some performance of these agreements has taken place, written evidence is not necessary. Agreements with moneylenders not made in a special form are void.

When a man has been induced to enter into some agreement by some fraudulent untrue statement made by the other party to the agreement, he can in some cases have the agreement set aside and in all cases he can sue the fraudulent person for damages.

If one party to an agreement fails to carry out his promise, the other party can in some cases compel him to do so. In all cases, however, the innocent party is entitled to sue for damages and to recover all that he has lost through the failure of the other.

The law of agreements in Scotland differs on many points from that of England. In particular, no consideration is required and a large class of agreements have to be proved by written evidence or by the sworn evidence of the person who is sued. *See* Hire-purchase; Insurance; Landlord; Lease; Rent; Repairs, etc.

AGRIMONY. Any fertile soil is suitable for this small genus of hardy herbaceous perennials, growing from 2 to 3 feet high, with yellow, fragrant flowers. It can be planted at any time of the year except the summer, and is propagated by division in spring. Eupatoria, odorata and suaveolens are a few of the best species. The hemp agrimony is Eupatorium cannabinum, a good native perennial, growing about a yard high, with purplish dowers. Pron. Ag'-ri-mo-ni.



Agrimony. Flower spikes of the herbaceous plant

Ague. *See* Malaria.

AIGRETTE. It is now illegal to import the osprey or aigrette formed from the tuft of feathers on the head of the smaller white heron, as the capture of the bird for the sake of the plume involves its death during the nesting season. Imitation aigrettes for millinery purposes are composed of various feathers or of wired jewels.

AIR-BRICK. These are of the same superficial size as the edge of an ordinary brick—9 in. by 3 in. Air-bricks are cast-iron or terra-cotta, and are placed in the base of all exterior walls, immediately below the damp course, for the purpose of ventilating the space between the ground level and the flooring. *See* Damp Course.

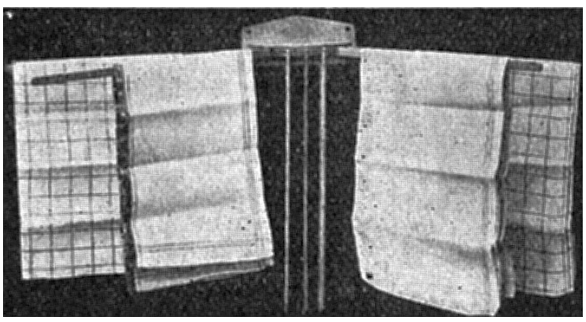
AIR CUSHION. In round, square, and oblong shapes, the best cushions are made of pure para rubber, but cheaper kinds are of material like that used for mackintoshes. Air is blown into the cushion through a valve. It should not be fully inflated or undue strain will be put on the rubber.

When, not in use, cushions ought to be hung up by a string fastened to the valve and should always contain a little air; folding them induces cracks in the material. In the event of leakage, cushions can be repaired with a thin cycle-tire patch or sheet rubber attached with rubber solution. This substance can be smeared along the joints if not air-tight, taking care that the material is quite clean.



Airedale Terrier. Prize-winning specimen of this wire-haired terrier which is an excellent house dog

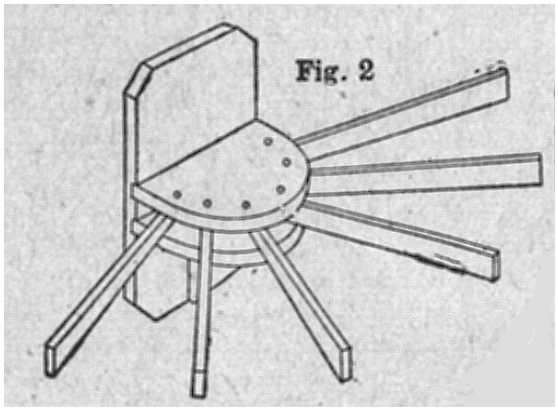
AIREDALE TERRIER. This is a modern breed of wire-haired terrier and makes an excellent house dog. A large, rather gaunt-looking dog, square built, standing 20 in. at the shoulder, its wiry coat is close-fitting, dense, and a bright, deep tan in colour, except that the back and neck are dark grey and the nose is black. It has a long, straight and flat-topped head with medium V-shaped ears and small dark eyes. The tail, always docked for show purposes, is carried nearly erect. *See* Dog.



Airer. Fig. 1. Convenient form attached to wall, with arms that fold down when out of use.

AIRER: For Clothes. Several kinds of airers are

used. One is a rack suspended from the ceiling and held in position by cords running over pulley wheels; another is a rack attached to the wall having a number of movable arms (Figs. 1 and 2). Both may be made by any amateur. Ordinary yellow deal may be used, but beech, birch, or oak will make a stronger job.



Airer. Fig. 2. Simple form with six movable arms.

For the airer shown in Fig. 2, the back piece is 11 in. by 8½ in. by 1 in., with the corners cut off 1 in. each way. Two grooves, each 1 in. wide and ⅜ in. deep, are cut in the back, the lower one being 5 in. up and the space between 1¼ in. Two 7½ in. lengths of 1-in. wood are fitted in the grooves, the width being 8½ in. with the end of each trimmed to a semicircle. Six holes should be bored in the top piece ¾ in. away from the edge and equally spaced along the circumference, the holes being just large enough to take a 3-in. wire nail. The six arms must be cut to a length of 2 ft. 6 in. from straight-grained wood, and carefully planed to 1¼ in. by ½ in., the edges being rounded and smoothed off. A hole, similar to those in the top, should be bored at one end of each arm, 1 in. away and exactly in the centre. The bottom piece must be supported by a bracket cut to a triangular shape and measuring 5 in. on the two right-angular sides. Fit the work together by nailing the bottom piece from the back of the groove and then nail on the bracket. Next nail on the top piece, and finally nail the arms in position.

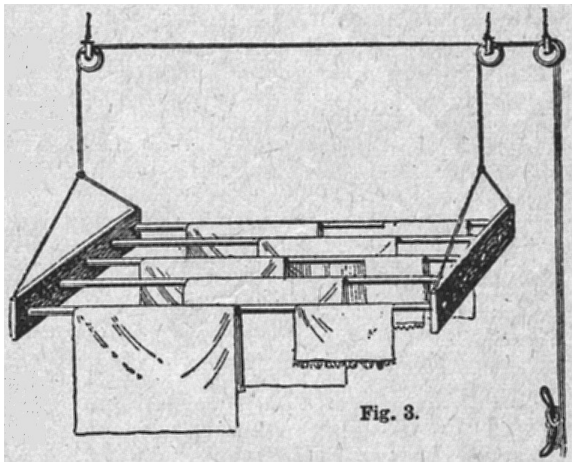


Fig. 3. Kitchen airer with five hanging rails, fitted with cords and pulleys for the purpose of raising it to the ceiling.

Many housewives prefer a ceiling airer (Fig. 3) which can be drawn up out of the way when not in use, and at the same time has the benefit of the hotter air which always rises. It may be made about 3 ft wide by between 5 ft. to 10 ft. long, and is raised or lowered by means of pulleys and rope. A serviceable size is 6 ft. by 3 ft. The end rails should finish ⅞ in. thick, and may be about 3 or 4 in. wide. The hanging rails, of which five are shown, but which may be increased to seven or eight, can be of stout bamboo or 1½ in. by ¾ in. laths, as preferred. The latter should be mortised right through the end rails and double wedged. The canes, if used, should be plugged with wood well glued in for several inches at each end. Corresponding holes, equally spaced, will previously have been bored in the end rails to receive them.

A hole in each glued joint, bored and screw-entered from the underside up through the cane and plug into the end rail, will stiffen the frame generally. About 12 yards of stout cord can be allowed, two lengths of which will be cut off for the slings. These can be attached to the end rails by means of stout, galvanised eyes, or the end rails can be holed for the cord to pass through and be knotted. Two single and one double pulley will be required. They should be entered into the joists for a firm fixing. The ends of the remaining length of cord can next be passed over the double pulley by way of the single pulleys and knotted securely to the slings. The cleat hook is screwed to any available woodwork in the room. *See* Clothes Horse; Laundry.

AIR GAS FOR COUNTRY HOUSES

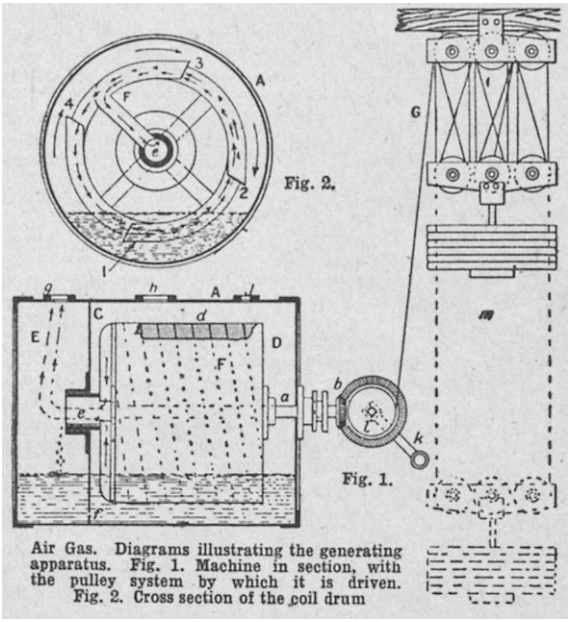
Safe Use of Petrol Mixtures for Lighting and Heating
For other methods *see* Electric Lighting; Gas, etc.

Air or petrol gas plants are extensively employed for the lighting (and cooking and heating) of private houses in the country, where no public supply of gas or electricity is available. Petrol is highly volatile at ordinary temperatures, and it is thus possible to vaporise it by mechanical means without the aid of heat.

There are two classes of apparatus in use. Both use incandescent mantles, as the flame in each case is non-luminous. Air gas containing from l.25 in 2.0 per cent. of petrol burns safely with proper arrangements; but if the proportion of petrol be anything between 2 per cent, and 5 per cent, the mixture is explosive. Hence in one of the two systems gas containing just under 2 per cent. is used, and in the other gas with over 5 per cent. Both are equally safe, while each claims to have its own special advantages.

The essential features of a representative type of apparatus are illustrated in Fig. 1. A is a fixed circular casing of iron supported, together with the gearing and other parts, on a suitable wooden or iron stand. The casing is divided by the diaphragm, C, into two compartments, D and E. the former being the mixing or carburetting chamber, and the latter the gas chamber. F is a drum rotated by the shaft, *a,* and gear,

b. This drum is in effect a series of circular hollow coils, usually four. Each makes several turns spirally round the drum; a portion of the coils is shown exposed at *d*. A cross-section of this coil drum is shown in Fig. 2. The outer ends of the coils 1, 2, 3, 4, open into the carburetting chamber, D, Fig. 1; the other end of each turns down into the small chamber, *e* , formed by enlarging the end of the axle of the drum.



Air Gas. Diagrams illustrating the generating apparatus. Fig. 1. Machine in section, with the pulley system by which it is driven. Fig. 2. Cross section of the coil drum

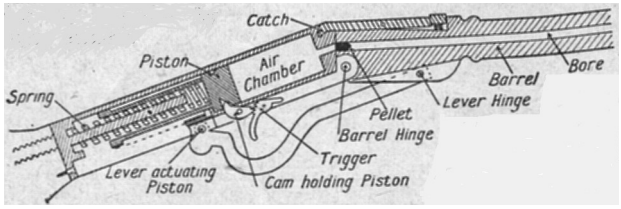
The casing is filled with petrol up to about the level shown, and the outer end of each coil dips in succession into the petrol as the drum turns round, the rotation being in the direction shown by the large arrows in Fig. 2. Each coil, as it passes through the petrol, picks up a certain amount of the spirit; this spirit is carried round inside the coil and, as it goes, drives the air before it through the coil, becoming intimately mixed with it in the process, till both issue from the chamber, *e*. Any petrol not taken up by the air drops into the bottom of the casing E, and finds its way back into the carburetting chamber through a small communicating passage, *f*. The air gas passes by the opening, *g*, into a small receiver, whence it is drawn as required.

Air is admitted into the carburetting chamber through the opening, *h* , fitted with a valve which, though permitting air to enter, allows nothing to escape. Petrol is put into the apparatus through the opening, *j* . Very little power is needed to drive the machinery, and in small plants it is supplied by a heavy weight and system of pulleys, as shown at G. The frame carrying the upper set of pulleys is attached to a beam in the ceiling. The weight is shown in dotted lines in its lowest position. It is wound up by means of the handle, *k*, the wire cord being at the same time wrapped round the drum, *l*.

When gas is being taken from the machine, the weight, *m*, falls gradually and turns the gearing. As soon as the gas ceases to be taken, the pressure which develops in the casing, A. stops the action of the weight, whereupon gas ceases to be made. The only labour needed is that for winding up the weight once a day, and putting in the supply of petrol.

Air gas has many recommendations. Though it has not the brilliance of incandescent gas, it is adequate for ordinary purposes. It can be used tor heating and cooking, though it may become expensive when used for these purposes. There is little risk involved in its use, provided only that proper burners are employed and arrangements made to prevent back-flash through the pipes. Low percentage burners must be gauze packed, and in any case, for either system, a safety chamber should be placed on the gas main between the gas-making apparatus and the burners. One point to be noted is to have the pipes large enough and the connexions easy; the free passage of the gas must not be impeded by sharp corners.

AIR GUN: How to Look After. The principles on which the various types of air gun work are more or less identical. An air chamber in the form of a cylinder having inside an accurately-fitting piston driven by a powerful spring is attached to the stock. A lever, usually connected to both stock and barrel, which are hinged together, compresses the spring when the barrel is pulled down: the piston is held in position by the trigger, and when the bullet or pellet is inserted, and the barrel replaced and locked by the catch, the gun is ready for use. On the release of the trigger the pellet receives the full force of the compressed air formed by the sudden release of the spring-driven piston.



Air Gun. Diagram showing the mechanism of an ordinary type of air weapon.

The only part of an air gun likely to get out of order with ordinary use is the spring. To effect repairs, and also to clean the internal mechanism, the metal cover must be unscrewed, together with any parts attached thereto. If the spring is weak or broken, a new one must be fitted The piston should be taken out, the new spring compressed in a vice, tied up with twine, and fitted in position. The trigger catch or attached rocking-cam should be examined for signs of wear, and, if necessary, new ones fitted. The parts should be re-placed, and, when secure, the string attached to the spring may be burnt with a red-hot wire and the bits pulled out with a wire hook.

AIR LOCK. In a hot water system an air lock is generally caused by faulty pipe arrangements permitting a gap to form in the column of water. The flow of hot water is thereby impeded by the imprisoned air. The remedy is to provide a release valve which can be opened to release the air. It should remain open until the water flows freely. *See* Central Heating.

AIR-PROOF PAPER. A dozen or so sheets of

paper may be laid on a table and ironed rapidly with a very hot iron, against which is held a piece of wax. The melted wax is absorbed by the paper through a number of the sheets. Another method is to dissolve one pound of white soap in one pint of water, and in another pint 2½ oz. of glue and ¾ oz. of gum arable. Mix the two solutions and warm together, then soak the paper before drying. Air-proof paper is used for jam-pot covers.

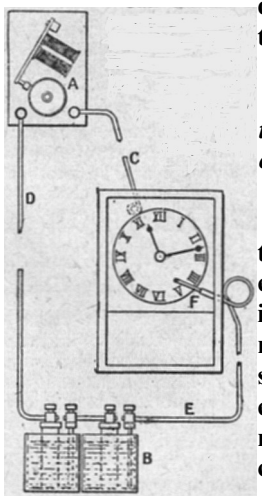
AITCHBONE. The thick top piece of the leg of beef next to the rump is economical on account of the small proportion of bone compared to the thickness of meat. It is a suitable cut for salting and boiling. *See* Beef.

AKEBIA. Quinata is the species mostly grown of this pretty rambling plant with its Japanese name and its violet or purple, fragrant, drooping flowers, which are produced in the axils of the leaves in late spring or early summer. It is best to grow it on a wall in cold districts. It likes a fertile and friable soil, preferably one which contains loam and peat. Pron. A-kee'-bi-a.

ALABASTER. A translucent form of gypsum which is largely used for ornamental purposes. Strong soap-and-water is best for cleaning alabaster. Rinse afterwards in clean warm water before drying. Alternatively wash with borax and water, half an ounce of the former to a pint of the latter. Dry with a piece of soft silk. Alabaster may be polished by rubbing with pumice-stone and then with a paste consisting of whitening soap and milk, finally finishing with a dry flannel. Another method is to polish with a cloth dipped in melted white beeswax.

The commonest way of mending broken alabaster ornaments is to use plaster of Paris, but this should only be done where the joints are not easily seen. It can be applied cold. A good formula is equal parts of yellow resin, plaster of Paris, and beeswax, this cement being applied hot.

ALARM. Fire, burglar, and call alarms are the three kinds in general use. The two former are described under their respective titles.

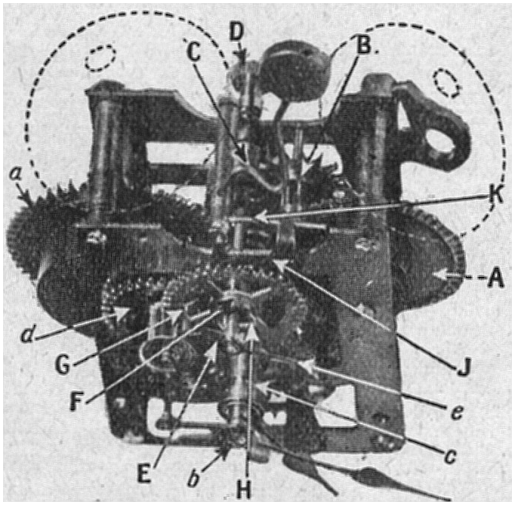


Alarm worked by a simple electric apparatus applied to an ordinary clock.

Call alarms are chiefly used to rouse one from sleep in the early morning. The alarm clock is dealt with separately in the next article, but any person can set up for himself a simple and effective call alarm. The necessary materials are : a plain clock, an electric bell, a small electric battery (one or two Leclanché cells will do), and sufficient insulated copper wire.

The diagram shows the arrangement : the bell, A, is near the bed head ; the battery, B, in any convenient place ; the wire lead, C, is fixed to the metal frame of the clock, twisted round any accessible part with bare wire against the metal, and goes to the bell. Another lead, D, goes from the bell to the battery, from which a third, E, goes back to the clock. Here it is fixed near the end to the wooden part of the clock, leaving a short free piece, F.

The tip of this piece is exposed and bent into a small hook. If the bell is to go off at 5 o'clock, say, this bare tip is set so that when the hour-hand of the clock gets to that time it will touh the tip and thus complete the circuit, whereupon the bell will ring and keep on ringing until the hand of the clock is released. *See* Burgler Alarm; Fire Alarm



Alarm clock. Works of an alarm clock removed from the case to show details of action. See text.

ALARM CLOCK. The movement of an ordinary lever drum alarm clock is illustrated. The motive power consists in a spring connected to the great wheel, *a* , which engages with its 48 cogs an 8-point pinion on the spindle of the centre wheel, which has also 48 teeth. This centre wheel makes a complete revolution once an hour, the minute hand being attached to the spindle, *b*. The centre wheel engages with a 6-point pinion on a 45-toothed train wheel, which in its turn engages with a 6-point pinion on the spindle which holds a second train wheel.

The toothed escapement wheel is driven by the second train wheel acting on a connecting pinion. The escape pallets strike against the teeth of the escapement wheel, and the speed of the lever holding the pallets is regulated by the balance-wheel acting on the pronged end.

The hour hand is attached to a loose sleeve, *c,* which fits on the spindle of the centre wheel; it has a pinion underneath which is fixed to the centre-wheel spindle, and this pinion drives a train wheel, *d,* to which is fixed a pinion engaging the wheel, *e,* on the loose hour sleeve.

The alarm action is driven by a spring attached to the wheel A, which drives through a pinion the escapement wheel B, the teeth of which engage a projection C and vibrate the striking hammer. The screw D turns the alarm hand E to the desired hour on the alarm dial. A slotted sleeve F is attached to the toothed wheel G, which revolves at the same speed as the clock hour hand.

On the stationary spindle of the alarm hand is a projection H parallel with the alarm hand. At the hour at which the alarm is set the slot in the sleeve allows the toothed wheel G to slip forward, propelled by the steel catch spring, J. In moving forward J releases the wire arm K attached to the alarm hammer spindle, and allows the alarm hammer to work until the spring is fully unwound. *See* Clock.

ALBUMEN. The chief source of albumen is eggs. It is contained in both white and yolk, but the latter has in addition a proportion of fat Albumen is imported, and also prepared in this country in a dried condition known as desiccated eggs. Only the best qualities are adapted for use in cooking.

Preparations of liquid egg are also imported. This form of albumen is sometimes employed in cake-making and pastry. Another form, obtained from milk, is used as a food for infants. *See* Diet; Egg.

ALCOHOL AND ALCOHOLISM. Alcohol for household purposes is generally used in the form of rectified spirit, which contains about 90 per cent. of pure alcohol by volume and 10 per cent. of water. In beverages, the highest proportion of alcohol occurs in liqueurs and spirits, the lowest in beers and light wines. Brandy and whisky contain from 40 to 50 per cent. of alcohol by volume; liqueurs from 40 to 52 percent.; port wine from 20 to 30 per cent.; sherry 16 to 22 per cent.; champagne 9 to 14 per cent.; hock, burgundy and claret 8 to 12 percent.; beers from 2 to 9 per cent.; stout from 2 to 5 per cent.; and cider usually less than 4 per cent.

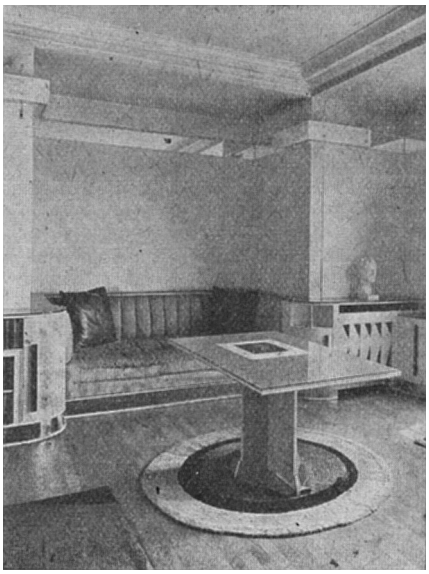
While it may be said that alcohol is never essential or beneficial to a healthy person, on the other hand there is no evidence that, in strict moderation, it is harmful. The effect of small doses on the stomach is to cause the blood-vessels to dilate, and stimulate the secretion of gastric juice. Hence, in some forms of dyspepsia a moderate amount of alcohol promotes the digestive processes. Nevertheless, it is better to cure dyspeptic conditions by appropriate treatment. Large doses of alcohol, taken habitually, cause chronic gastritis and permanent digestive disorder.

The effect of alcohol on the heart is to cause it to beat more powerfully and more rapidly, but this stimulating effect soon passes off, and the heart is left in a more exhausted state than before. Hence the practice of giving alcohol for fainting or conditions of collapse is not to be recommended. *(See* First Aid.) It has been found that alcohol is of no value in assisting Arctic explorers to resist the extreme cold.

The evil effects of excessive addiction to alcohol may be manifested as acute alcoholism or ordinary drunkenness, and chronic alcoholism. When a large quantity has been taken, the best simple treatment is to empty the stomach by administering an emetic such as a tablespoonful of mustard in a glass of warm water. A doctor may think it necessary to pass a stomach tube and wash out the stomach.

Many preparations have been advertised as cures for alcoholism, but no drug is known which will abate the craving, except at the cost of producing other habits and symptoms equally serious. Real cure can only be obtained by complete abandonment of alcohol. The practice of surreptitiously adding so-called " cures " to an inebriate's food is useless.

Alcohol is not required in convalescence from illness. Most of the medicated wines contain port or sherry, with meat or malt extract, pepsin, iron, or other food or medicinal substance. Alcohol is best avoided by nursing mothers, and should never be given to children.



Alcove in a modern dining-room fitted with a built-in settee with cupboards at either end. Easton & Robertson, F.R.I.B.A.

ALCOVE. This is a recess in a room or in a garden wall. An alcove was a common feature of bedrooms in older houses, and the fashion has been renewed by some modern architects. The head of the bed with the bedside-table and a chair may be placed in the alcove, the advantage of this arrangement being that there is shelter for the head of the sleeper from any draught, so that the windows can be kept wide open.

In a dining-room which is also used as a sitting-room, the alcove can accommodate the dining-table; or it may serve in a general living-room as a quiet corner where the children can do their lessons or the elders their writing. A shallow alcove may be fitted with a built-in settee and cupboards as in the illustration given.

ALE. The term ale is now confined to lighter coloured beer, the black beers being called porter or stout, according to their specific gravity. One recipe of many for mulled ale is to add to a pint of good ale two or three yolks of eggs, two tablespoonfuls of loaf sugar, a pinch of ginger, and the same of nutmeg. Make the ale hot, but do not let it boil; then

take it from the fire and stir in the eggs, beaten with the sugar and spice. Pour it from one vessel to an-other five or six times until it froths, and drink hot.

Ale can be brewed at home, but it must not be made without a licence, the penalty for brewing without such a licence being £500. The occupier of a house not exceeding £8 annual value may, under certain conditions, brew without charge, but he must first obtain the necessary licence from the local excise authorities. *See* Beer; Ginger Ale, etc.

ALEXANDRA SOUP. Take a cupful of lentils and two heaped tablespoonfuls of barley and soak them together for at least 12 hours. Next day chop up an onion and fry it in half an ounce chop up an onion and fry it in half an ounce of margarine, add the lentils and barley with three breakfastcupfuls of water, and cook until the lentils are tender. Add a couple of fresh tomatoes when the soup is nearly ready. Rub all through a sieve and heat before serving. *See* Lentil Soup.

ALIMONY. The term alimony is used in law to denote a sum of money agreed, or ordered, to be paid by a husband to a wife at a time when the marriage is still in existence. Thus alimony is payable either (1) while proceedings are pending for divorce, nullity or judicial separation (alimony 'pendente lite'); or (2) after the making of a decree for judicial separation, whether the petition has been presented by the husband or by the wife (permanent alimony). When a decree has been made in a suit for divorce or nullity, and the marriage relationship is thus ended, any money ordered to be paid by the husband is called, not 'alimony,' but 'maintenance.' Alimony pendente lite will usually amount to such a sum as will make the wife's total income (including any private income she may have) equal to about one fifth of the combined incomes of husband and wife. In permanent alimony the proportion is usually one third. *See* Maintenance; Separation Order.

ALKALIES. The group of chemicals known as alkalies have a strong cleaning action and an alkaline reaction. The four chief alkalies are:

(1) Ammonia, which has the advantage of being in both liquid and solid forms, and which as a liquid leaves no residue behind.

(2) Freshly slaked lime, a useful scouring agent and water softener. It is best mixed with twice its bulk of dried carbonate of soda for use as a water softener.

(3) Potashes and pearlashes are obtained by burning wood. They are in the form of coarse, white powder, and are used for scouring saucepans, and cleaning sinks and water-closet pans. For the two last-named purposes, the potashes or pearlashes are dissolved in hot water in the proportion of a tablespoonful to a pint. A stronger form of potash is known as caustic potash. It burns the skin unless it is washed off quickly.

(4) Soda, This is the common name for a crystallised carbonate of soda, also known as washing soda. It is the most used alkali for softening water employed for cleaning purposes. Caustic soda is a stronger form of soda.

Alkalies should not be used for cleaning aluminium ware, as they have a corroding effect on the metal. *See* Ammonia; Lime; Soda.

ALL FOURS: An old Card Game. This card game for two or four players is also called seven up.

Two-handed All Fours. Players cut for deal, and the dealer then gives six cards, three at a time, to his opponent and himself, and turns up the thirteenth card for trumps. If the turn-up is a knave, the dealer scores a point. The elder hand then plays a card, or says, "I beg," according to whether he is satisfied with his hand or not. If he says, "I beg," the dealer must either allow him to score a point or deal three more cards to his opponent and himself, turning up the seventh card for fresh trumps. If trumps remain unchanged, three more cards must be dealt each player, and the seventh card turned up until there is a change. Any new knave turned up gives the dealer a point.

The elder hand, when he decides to play, leads any card he chooses, and the dealer may take it with a higher card of the same suit or with a trump, the right to play the latter not being affected by his holding cards of the suit led. But if, having a card of the suit led, he neither trumps nor follows suit, he is penalised for a revoke.

The following are the methods of scoring and the names of the scores. High: the highest trump played, scoring one to the original holder. Low: the lowest trump played, scoring one to the original holder. Jack: knave of trumps, scoring one to the dealer if turned up, or one to the winner of the trick to which it falls. Game: one point scored by the player who finally holds the greatest number among the cards won by him, that number being reckoned as follows: For each ten, 10; for each ace, 4; for each king, 3; for each queen, 2; for each knave, 1.

The order of counting the scoring is High, Low, Jack, Game, except where Jack is the turn-up. The object of the game is to capture the Jack and those cards which count in Game. In the case of equal scores in Game, the elder hand scores a point. If only one trump is out, the player holding it counts it High and Low. If no player has an ace, ten, or court card, the elder hand counts a point for Game.

If a player revokes, he cannot win the game on that hand, nor Jack and Game, his opponent adding two to his score when Jack is out and one if Jack is not out. The player first scoring seven points wins the game, though sometimes nine or eleven points are played for.

Four-handed All Fours. The rules are similar to two-handed, but the players cut for partners, and each player plays in rotation, the dealer and elder hand

alone looking at their cards in the first instance, elder hand having the option of begging. The other two players must not look at their cards until the dealer has decided whether he will give one or deal three, fresh cards.

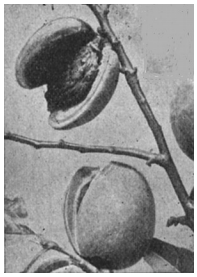
ALLOWANCE. This term is used for a payment which is voluntary and is not necessarily given in return for services rendered. It is thus entirely distinct from a salary or wage, which is a legal obligation. The sum of money given by a husband to his wife or by a father to his daughter is known as an allowance, the amount varying in accordance with the income and the expenses of the person who makes it. A tenth of a man's income would be a good allowance for a wife, while in most cases much less is given for her personal use.

It is desirable from every point of view for a wife to have a definite sum as an allowance which should be paid to her weekly or monthly according as the husband receives his salary, and from this she should meet certain defined expenditure. A wife's allowance should be sufficient to provide her with clothes and pocket-money, but she is not expected to pay from it the expenses of her holidays or her doctor's bills. Another form of allowance is the separation allowance (q.v.).

A voluntary allowance is not subject to income tax.

ALLSPICE. Sometimes known as Jamaica pepper, this pea-like berry, when dried and crushed, provides a spice which seems to combine the flavours of cinnamon, cloves, and nutmeg.

Its common uses are in making gingerbread and pickles, and in curing hams, and it is one of the component parts of curry powder. It is also used for these purposes and for adding to spiced wine as a tincture, made by letting two tablespoonfuls of powdered allspice soak in a pint of brandy for a fortnight, shaking occasionally to extract the flavour. It should be strained and bottled at the end of that time.



Almond. Fruit split open, showing stone containing edible kernel.

ALMOND. The Prunus Amygdalus of botanists is cultivated almost exclusively for ornament in British gardens, where its delicate pale pink blossoms open before its leaves in March and even in February. The sweet almond is rather earlier in bloom than the com-mon, and has rosy flowers. The bitter almond, amara, has paler flowers. The dwarf, nana or Besseriana, only grows about a yard high, and has rose-pink flowers. There are also white varieties.



Spray of almond blossom.

The almonds may be planted as standards between November and February inclusive. They are not at all particular as to soil, but they like a drained site, and should be well staked. Little pruning is required, but if the head of a young tree contains straggly branches it may be regulated.

In Cookery. The Jordan almond from Malaga is the best variety of sweet almond. As a food almonds are highly nutritious, and bulk largely in a vegetarian dietary. They contain little starch, and for that reason are invaluable in the dieting of persons suffering from diabetes. Crushed almonds yield a flour for the bread and biscuits recommended to diabetic patients. Powdered almonds are used for marzipan and macaroons. Essence of almond is a favourite flavouring for cakes and puddings.

To blanch almonds, soak them in boiling water for five or six minutes until the skin can easily be removed by pressing each nut between the thumb and finger. After peeling, rinse the almonds in cold water, then drain dry or rub them in a clean cloth. *See* Bitter Almond.

ALMOND CAKE. The ingredients are 6 oz. margarine or butter, two thin slices of citron peel, 6 oz. castor sugar, 1 teaspoonful baking-powder. 10 oz. best white flour, three large eggs, ½ gill milk (if required), and 1 teaspoonful almond flavouring. Grease a round cake-tin and line with greased paper. Sieve the flour and baking-powder together. Beat each egg separately into the creamed sugar and butter and beat well for a few minutes. Lightly fold the flour into this mixture, which should be soft enough just to drop from a spoon, but not to run off. Add a little milk if too stiff, and last the flavouring.

Put the mixture into the cake-tin already prepared. Bake in a moderately hot oven for three-quarters to one hour. Decorate the top of the cake with the slices of citron peel when about half cooked. When ready the cake should be placed on a sieve to cool.

ALMOND CHEESE CAKES. Take 2 oz. ground almonds, 2 oz. castor sugar, ½ oz. cornflour, ¼ oz. butter, 1 egg, and some raspberry jam. Add the well-beaten eggs gradually and smoothly to the cornflour, following with the sugar, almonds, and butter (melted). Line some patty-pans with scraps of short paste, and spread a little jam in the bottom of each, then pour in sufficient of the mixture to reach within ¼ in. of the top of the paste. The cakes should be baked for 20 minutes in a moderate oven. They are suitable either for tea or as a dinner sweet.

ALMOND FINGERS. These are made with ¼ lb. flour, ¼ lb. ground almonds, ¼ lb. butter, 2 oz. almonds (peeled and chopped), 2 oz. sugar, 1 egg and a little raspberry jam. Rub the butter into the flour (margarine may be used instead of butter), add one teaspoonful of sugar with the yolk of the egg and

mix all to a stiff dough. Roll this into a strip 3 in. wide, place on a greased tin and spread the jam on the strip. Mix together the white of the egg, the ground almonds, and the rest of the sugar, and work to a paste, which should be spread on the top of the jam together with the chopped almonds. Bake for 30 minutes in a moderate oven and cut into fingers.

ALMOND PASTE. Use 1 lb. ground almonds (in the proportion of one bitter almond to four sweet), the yolks of two eggs, the white of one, ¼ lb. castor sugar, 1 teaspoonful of orange flower water, and a few drops of essence of almonds. Put the almonds, sugar, and yolks of eggs into a pan and stir them over gentle heat until reduced to a paste; add the orange flower water and the beaten white of egg. This will cover a cake of about 3 lb.

ALMOND PUDDING. A good recipe consists of 2 oz. sugar, 2 oz. ground almonds, 2 oz. butter or margarine, 2 tea cups of breadcrumbs, 1 egg, 2 oz. chopped peel, and a gill of milk. Beat butter and sugar to a cream, add the ground almonds, breadcrumbs, and warmed milk, and stir well. Add the peel and the egg well beaten. Pour into a greased pie-dish, and bake for 10 or 15 minutes till firm. Serve with custard sauce flavoured with almond essence. This is ample for four persons.

ALMOND ROCK. This needs a teacupful of best golden syrup, 1 teacupful of water, 3 teaspoonfuls of vinegar, 1 lb. Demorara sugar, ¼ lb. butter, and a few drops of almond essence. Boil all together for about 15 minutes. Put a little into cold water, and if crisp it is ready. Add one or two tablespoonfuls of blanched almonds and pour all into a buttered tin.

ALMOND TOFFEE. This is made from ½ lb. almonds, 1½ lb. loaf sugar, ¾ pint water, a little almond essence, and a small pinch of cream of tartar. After blanching the almonds, halve them and dry in a warm oven. Let the sugar dissolve in the water, put in the cream of tartar, and boil until the syrup becomes a deep amber colour. Do not add the almonds until the stew-pan has been taken off the fire; then boil the mixture up again and pour it on to a buttered tin.

ALOE. The true medicinal aloes are evergreen, greenhouse plants, ranging from 1 ft. to 30 ft. in height. They thrive best in large tubs, in a mixture of loam, sand and lime, and are increased by seeds sown in pans of sandy soil, and kept at a temperature of at least 65° F. The American aloe is the agave (q.v.).

ALPACA. This fine material with a natural lustre is used principally for black linings, aprons, servants' dresses, and men's office coats. It is woven from the hair or wool of the alpaca, which is a South American animal of the camel family. The natural colours are brown, grey, and black. Alpaca cloth is liable to be confused with mohair, which it somewhat resembles. Alpaca is washable in any flaked soap and warm water. If dried without wringing, it will be crisp and glossy. *See* Mohair.

ALPINE PLANTS. The name is applied indiscriminately to plants which are natives of the Alps, Apennines, and other mountainous districts of Europe, and in Britain figure chiefly in the rock garden. Alpine plants do not need anything special in the way of rock-work or stonework to protect them. They will do perfectly well on gritty ground in our cool climate if they are not overrun by coarser plants. Alpine plants are generally low-growing herbs of perennial habit, and thrive in drained soil in which the roots can be kept cool. A garden devoted to these plants is sometimes called an alpine garden. *See* Rock Garden.

ALSATIAN, or Shepherd Dog. Introduced into Great Britain in 1918, this breed has achieved remarkable popularity. During the last year or two much has been made of the fact that a few ferocious Alsatians have been banned in the courts, but the breed, like many others, has its bad-tempered representatives. Most Alsatians are good-tempered and obedient.



Alsatian Wolfhound. Champion of the breed originally bred by the shepherds of Alsace.

The Alsatian has been produced by the union of two or three strains of shepherd dogs, and though wolf-like in appearance, the cross with the wolf is fairly remote. In colour these dogs may be black, brown, fawn, black and tan, iron grey, cinder grey and sable. White specimens are not favoured. The gait should be a wolf-like lope.

Dogs should stand about twenty-four inches at the shoulder, and bitches a couple of inches less. The ears should be stiffly erect, and broad at the base. Faulty ear carriage (a soft ear or ears) is common. The head ought to be clean in its outline, long and strong in the muzzle, and broad in the skull, with dark almond-shaped eyes. A deep chest, straight big-boned limbs, with well-placed hocks and strong feet are points of importance. The tail should be carried down—never curled over the back. Obedience classes for those dogs are a feature at all the leading shows.

ALTERNATING CURRENT. This is an electric current which continually changes its direction round a circuit, as distinct from direct current, which flows always in one direction. Both systems are used in electric lighting. For certain purposes, e.g. the charging of accumulators, alternating current cannot be directly

employed. The alternating current in such a case must be transformed by a rectifier (q.v.).

One complete change or alternation of current is called a period or cycle. The voltage of the mains, together with the periodicity in cycles, is marked on the supply meter; the periodicity is shown thus (~)

The majority of broadcast receivers can be operated entirely from the mains, provided A.C. valves are employed, and sets which utilise ordinary valves can obtain their high tension supply from this source.

See Broadcast Receiving Sets; Electricity; Eliminator; Valves.

ALUM: Its Many Uses. The kinds sold are potash and ammonia alum. Both have the same properties and are used for like purposes. Alum is sold as crystals and as a powder: the latter is the usual kind.

Alum is much employed as a mordant in dyeing and as a fire-proofing material. It acts as a water purifier when a small proportion of a solution of alum is added to a large bulk of water. The reason for its action is that a gelatinous precipitate is formed when alum solution is much diluted, and as this precipitate settles to the bottom of the vessel it takes down with it any organic impurities in the water. The amount added is not sufficient to give an unpleasant taste to the water.

As a medicine alum is not often given internally. As a lotion to check excessive sweating of the hands and feet, a tablespoonful of alum should be dissolved in a pint of water. As a gargle, mouth-wash, or spray for swollen tonsils, the strength used is ten grains in one ounce of water, sweetened with honey. Care should be taken to rinse the mouth afterwards, as alum has a very injurious effect on the teeth.

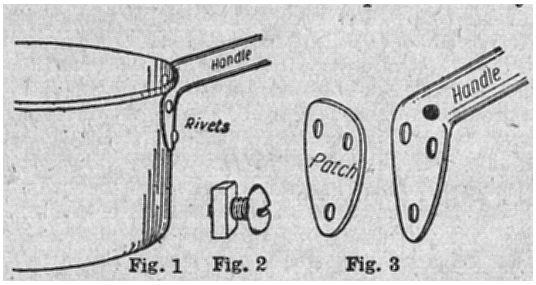
ALUMINIUM. Cooking utensils of aluminium become heated through more quickly and uniformly than those made of other metals, and this means economy of fuel and generally better cooking. With its lightness and freedom from corrosion, it can be recommended for the kitchen. It requires less polishing, and does not readily tarnish. Gritty polishes should be avoided because its surface easily shows scratches. A good composition is—stearic acid 1 part, fuller's earth 1 part, rottenstone 6 parts.

Soda darkens aluminium and eats it away. For this reason aluminium cooking utensils should not be cleaned in soda-water or have soda put in them when in use. Aluminium can be turned white again by nitric acid followed by careful washing. The acid attacks the exterior and leaves fresh metal exposed.

Pure aluminium easily bends, and is mostly alloyed with small proportions of other metal, usually zinc or copper. For culinary utensils, and articles which have to be bent and pressed considerably in manufacture, it is almost pure. For most other purposes there is nearly 10 per cent, of other metal For motor vehicles its lightness has caused it to be extensively used.

Repairing Aluminium Pots and Pans. To a large extent articles made of aluminium have no joints.

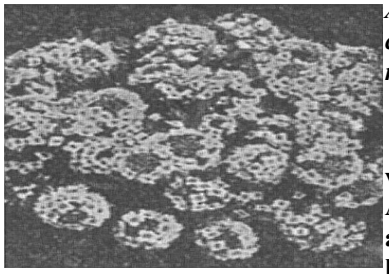
They are cast in solid metal or pressed from a single piece of sheet. Handles of saucepans and similar articles are generally riveted on, as seen in Fig. 1. The body of the saucepan is a single piece of aluminium drawn to shape in a die, and the handle is of malleable iron. Rivets sometimes become loose and the handle of the utensil no longer holds tightly. The remedy is to tighten the rivet by hammering one end while the other bears on solid metal. If rivets come out and are lost the best method of mending is to use small bolts.



Aluminium. Fig.1. Saucepan with iron handle attached by rivets. Fig.2. Stove bolt. Fig.3. Method of attaching handle by stove bolt.

Fig. 2 shows a stove bolt. This is the most suitable kind and is easier to insert than a rivet. After it is screwed up the projecting end should be nipped off or filed till it is nearly flush with the nut. The end can be hammered as well to prevent any risk of the nut working back. If a rivet hole has become too large a washer can be used between the bolt head and the sheet metal. Sometimes damage to the rivet holes in the pan may be made good by covering them with another piece of metal, as in Fig 3, the metal of the pan being enclosed between.

A hole lower down in a saucepan is not easy to deal with. The quickest and perhaps most satisfactory way is to use one of the pot-menders which are obtainable at most ironmongers. Aluminium is a difficult metal to solder. Fluxes are considered useless, and the general practice is to tin the surface as quickly as possible after it has been cleaned. Solder specially made for aluminium is employed. The efficiency of the joint depends on the adhesion between the tinning coat and the aluminium. The parts can then be united. As heat is conducted rapidly the metal near the joints should be heated almost to the melting point of the solder. The parts should be kept pressed closely together till the solder is set.

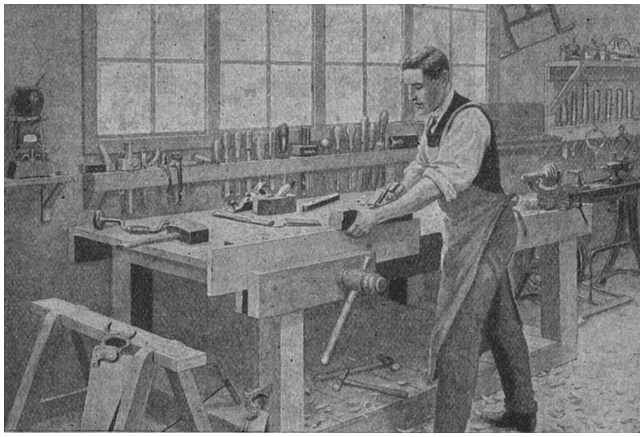


Alyssum. Flower clusters of this spring rock plant.

ALYSSUM. The various species of Alyssum or Madwort are distinguished by hardiness, freedom of bloom, brightness of colour, and ease of cultivation. Of those which are grown as annuals, the white sweet

Alyssum (maritimum) is 10-12 inches high, but a more useful variety is the low-growing white compac-tum or Little Dorrit, 4 inches high, which blooms throughout the summer. A Lilac Queen, 4 inches high, has blush-coloured flowers. All are sown out of doors in spring.

There are many forms of saxatile ("Gold Dust"), a dwarf perennial with yellow flowers. Compactum is more desirable than the type, being of denser habit: flore pleno has double flowers. Alpestre and mon-tanum have yellow flowers; pyrenaicum and spinosum are white; Wierzbeckii has deep yellow flowers on stems 18 inches high They all like a limestone or sandy soil and a sunny position. Pron. A-liss'-um.



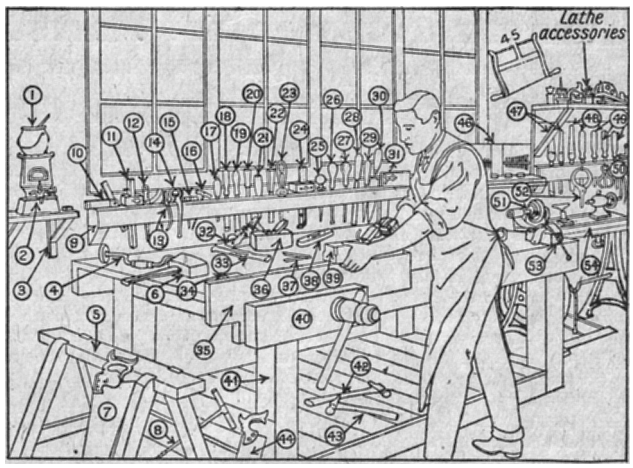
Amateur Carpentry. Equipment of an amateur's workshop; a key to the tools and accessories are given below

AMATEUR CARPENTRY. In and around every home there is always work to be done which generally requires but simple equipment. A sash-cord may need replacing, a door has to be eased to clear the heavy pile of a new carpet, a spring blind requires attention, a cornice fitment, gilt mirror or overmantel has to be fixed. An extra shelf is wanted in the pantry, or a drop-leaf table for the scullery. Garden requirements include arches, trellis-work, frames, a seat and chairs, a tool-shed, a greenhouse. These are only a few of the innumerable jobs that may be successfully tackled by the home carpenter with a modestly equipped workshop.

A simple and inexpensive kit of tools may include a jack and a smoothing plane, half-rip handsaw, tenon saw, 4 to 6 firmer chisels from ¼ to 1 in. or ⅛ to 1¼ in., ratchet brace and 6 assorted bits, claw hammer, pair of pincers, axe, medium grade India oilstone. A work bench is required, and a suitable size would be 4 ft. 6 in. to 5 ft. long, 2 ft. 6 in. high and 16 in. wide on top.

A workshop of some kind is desirable. Wherever the work has to be carried on, be sure that it is well lighted. Get a corner of the room near the window or the best lighted attic, and, if possible, a window that faces north. Probably, however, the ultimate choice will fall on a shed in the garden, and this can be arranged to give the maximum of efficiency. The following notes are based on this assumption, but those who have to be content with a space in the house should endeavour to adapt the suggestions as far as possible to their personal needs.

A minimum size for the workshop or shed would be 10 ft. long and 8 ft. wide, with an eaves height of 7 ft. A building with a span roof is preferable to a lean-to, as the roof space is valuable as a storage loft for drying off timber. (For both types *see* Workshop.) A portable building may be purchased in sections from a reputable firm. This would be delivered in sections ready to erect A wooden floor may be used, or one of concrete may be constructed on the site chosen.



Key to the illustration above. 1. Glue Pot. 2. Stove. 3. Bracket. 4. Brace. 5. Sawing dog. 6. Mallet. 7. Hand Saw. 8. Auger. 9. Tool Rack. 10. Bevel Square. 11. Marking Gauge. 12. Wing Compasses. 13. Combination Pliers. 14. Pincers. 15 and 16. Gimlets. 17. Bradawl. 18, 20, 21 and 22. Chisels. 19. Firmer Gouge. 23. Keyhole Saw. 24. Mortise Gauge. 25. Awl. 26 and 27. Screwdrivers. 28 and 29. Files. 30. Half-round Rasp. 31. Square. 32. Block Plane. 33. Spokeshave. 34. Bench Stop. 35. Work. 36. Smoothing Plane. 37. 2-ft Rule. 38. Spirit Level. 39. Jack Plane. 40. Vice. 41. Bench. 42 and 43. Hammers. 44. Tenon Saw. 45. Bow Saw. 46. Taps and Dies. 47, 48 and 49. Hand-turning Tools. 51. Head Stock. 50 and 52. Calipers. 53. Vice. 54. Lathe.

The work-bench must be, above all else, strong and rigid. It can be built into the walls. The carpenter's bench shown in the illustration has the advantage of portability, and can also be purchased ready for use. The vice, made of hard wood, can be used, or an all-metal one obtained which has only to be bolted firmly to the bench. While attaching the vice, fix up a bench stop. This is used to keep a piece of wood in place while it is being planed.

The illustration above shows the equipment and arrangement of the workshop. The tools, representing a fairly complete range, are identified in the key. In addition to the carpentry implements a treadle lathe with hand-turning tools is depicted. *See* Bench; Cabinet Making Tools; Wood; Workshop.

AMATEUR THEATRICALS: PLAYS AND STAGING

Some Practical Hints on Play Producing for Amusement.

This article contains useful information for those desirous of giving entertainments of this kind in a simple manner. See also Fancy Dress; Make-Up; Stage

When a theatrical performance has been decided on, the most important step is to secure a good stage-manager or producer. A professional is sometimes engaged to produce the play and has the assistance of an amateur stage-manager. For the less ambitious type of performance the amateur stage-manager combines with his other duties those of producer. Some experience, ability to play every part in the piece, tact, imperturbable temper, readiness to listen to arguments, and lack of obstinacy are qualities required in the producer-stage-manager.

The next point is the choice of a play. Consider the area at disposal; twelve people cannot be expected to move and act naturally in a space which can only accommodate three. Consider the height: the balcony scene in "Romeo and Juliet" cannot be given with only seven feet of headroom.

Consider the inevitable limitations of the scenery. Consider the capabilities of the actors as a combination. A simple piece well acted all round is more satisfactory than one star performance badly supported. Consider, above all, the audience; in ninety-nine cases out of a hundred they prefer to be amused. Finally, it is a mistake to select a piece which many of them have probably recently seen performed by a first-rate professional company.

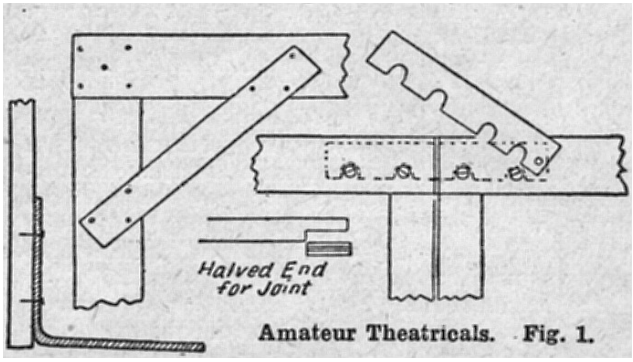
The casting of the piece naturally follows, and there are advantages in leaving this task to the stage-manager or producer. Do not in any case choose hurriedly, for mistakes cannot afterwards be rectified easily.

Rehearsals. The producer must study every part. He should work out movements and positions of every character from rise to fall of curtain. When this is accomplished, a convenient date is fixed for the first rehearsal. At this the producer should read the play through, afterwards giving each performer some idea of the character he is playing, and generally clearing away any difficulties. The second rehearsal should take place on the stage, or on a space of the same size, with the furniture arranged as on the night, and the positions should be gone through, giving time to the actors to mark them in their books.

The next three rehearsals, assuming the play to be in three acts, should be devoted to one act apiece in turn. The sixth, seventh and eighth will be well employed in the same way, but now rigidly enforcing the rule "no books," supplying all the properties required, and insisting on the actors playing as if it were the actual performance; paying special attention to the principal characters, and letting no awkward positions, meaningless grimaces, or any exaggerated gestures, or wrong intonations or emphases pass uncorrected. Two or three rehearsals of the whole play, not counting the dress rehearsal, should then be sufficient.

The dress rehearsal must be carried out as a complete performance, and the stage-manager will then have to see the stage set and all the stage properties in place; perhaps make-up the actors: get the beginners on the stage; draw the curtains; prompt—although it is wiser to appoint a special prompter; see that each actor is at the proper entrance in time, and has at hand any properties needed; close the curtains at the end of the act; change the furniture, if necessary; start the music, if any be provided; and so on until the curtain falls.

The Stage. A platform raised two feet from the floor adds to the enjoyment, but is not absolutely necessary, and unless the room is 14 feet high should not be attempted. The drawbacks against using the floor of the room for the stage may be mitigated by setting the front row of seats as far back as is consistent with the number of spectators; by using low seats for the front rows; and by reducing as far as possible the number of scenes in which the actors themselves are seated.



These diagrams show how metal angle-brackets, diagonal wooden braces and the ordinary wood-joint are used in stage construction, with a slotted hinged brace for securing screens.

The proscenium is the partition which divides the audience from the stage, carries the curtain, and forms a frame for the scene. One of those rooms partly divided into two by an archway gives a proscenium ready made. Failing this, a built-up proscenium is not altogether essential, as an entertainment can be contrived by selecting scenes from the works of the older playwrights, all of which were so constructed that the dramatis personae simply walked on at the beginning and off at the end, or by picking out more modern plays which do not commence with the discovery of some of the characters or end with an unavoidable picture. A couple of screens high enough to conceal completely those on the stage, and wide enough to meet in the middle when drawn out from either side, will serve as a combined proscenium, curtains, and wings for those waiting their entrances "off," and

entail a minimum of trouble and expense.

Building a Portable Stage. Trestles and barrels can work wonders to improvise a platform; but the small expense of buying good, durable timber to cover them is always worth while. Fig. 2. shows what can be done with an area of only 12 feet by 8, allowing for back passage, side spaces, and a foot strip in front of the front curtain. Such a stage can be put together very quickly by three or four people, and little skill is required.

Makeshift. "Making things do" is the task of the amateur, as Mr. Rodney Bennett points out in his excellent little book "Let's Do A Play" (Nelson). These limitations are often advantages, particularly in home theatricals. Parish hall or drawing-room can provide all that the dramatic enthusiast needs. For the drawing-room, choose a drawing-room play, such as St. John Ervine's "The First Mrs. Fraser," for which no properties are wanted at all. The box-room makes an excellent "saloon" setting for a Wild West drama; and

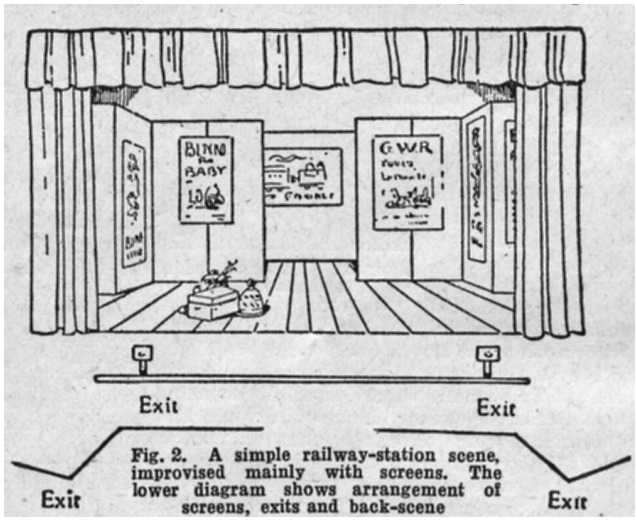


Fig. 2. A simple railway-station scene, improvised mainly with screens. The lower diagram shows arrangement of screens, exits and back-scene

if a crowd is required for a larger production—perhaps a Shakespeare play—the audience themselves can be the crowd. Most homes have screens, curtains, and curtained french windows which ingenuity can quickly adapt to theatrical purposes. Fig. 2, above, shows how effectively a couple of posters, a form, and some luggage can be used, with the all-important screens, to make a railway station waiting-room (suitable for the last act of "The Ghost Train," for example). The simplest "properties" are needed: their value lies in suggestion rather than in realism.

A little simple painting will be useful. If possible, a play which retains the same scene for all all it acts, or else a one-act play, should be chosen. The scene-painter leaves out as much as he can, remembering that from a distance only the general effect is noticed. In painting a backcloth, a mixture of whiting and size must be laid on first (the packet gives the proportions). The cloth is marked off in squares according to a scale drawing, and powder colours, mixed in jam jars, are applied with large brushes. Above all, scenery should not distract; if the acting is good, the audience will hardly notice the setting; and anything is better than long waits between acts, for certain plays an arrangement of dark curtains will suffice, without any scenery.

Lighting is very important, and too complicated to be described in detail here. There are plenty of good little books on the subject. In general, safety must come first: never risk a fire. Lights must never be seen by the audience, or the illusion is spoilt.

The Actor's Job. One of the hardest tasks is to "be natural" on the stage. The greatest asset is a childlike imagination, the infinite ability to play "Let's Pretend" which enables a woman to play a man's part, or vice versa.

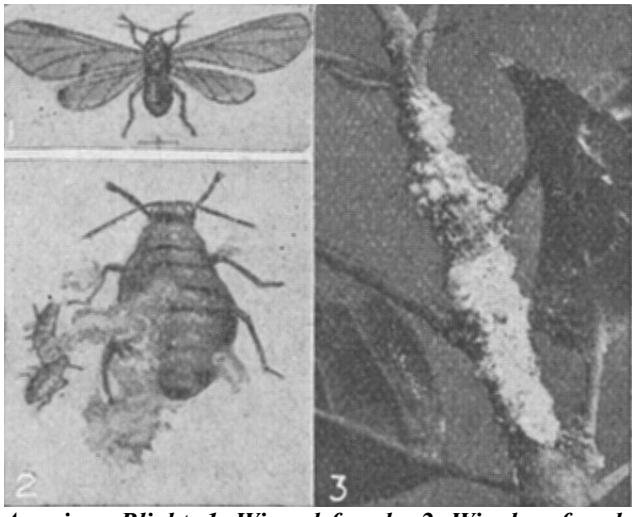
The first thing for the performer is to learn the author's words and the cues—that is, the ends of speeches which precede his own; the second, to read the play through with care to find out what his character is, how to make up, dress, etc., and so form a concrete image of the personality of the part. Tricks and mannerisms which would be appropriate should be tried; those minor movements which come under the heading of "by-play" or "business" and where and when each is to be employed should be settled, and always when going through the part kept to its appointed place. Each speech in turn must be gone through and the meaning duly emphasised to convey it to the audience.

AMBER. Ornaments of amber are supposed to bring good luck, and even to bestow on the wearer the gift of eloquence. The usual form of amber necklace is the yellow opaque variety moulded into beads; but there is also a clear amber both in yellow and reddish brown. Sicilian amber is red with green or blue lights in it. Amber is seldom worn otherwise than as a neck ornament and usually in the form of beads.

To join amber cover the parts with linseed oil, warm carefully over a flame until the oiled surface feels sticky, and then press firmly together until cold. Caustic soda may be used in place of linseed oil. A cement for amber may be made by dissolving sufficient gum copal in ether to form a syrupy fluid. Warm the broken portions, apply the cement and bind the two pieces together until the cement has set.

AMBER PUDDING. A light steamed pudding is made with these ingredients: 2 oz. flour, 6 oz. breadcrumbs, ¼ lb. suet (chopped), 2 oz. sugar, 1 teaspoonful baking-powder, 2 tablespoonfuls golden syrup and 2 eggs. Add a little grated lemon rind for flavouring. Mix the suet with the breadcrumbs, flour, sugar and baking-powder. Warm the syrup and add it, then the well-beaten eggs. Milk may be added if too dry. Grate in the lemon rind and stir. Place the mixture in a greased bowl and cover tightly with greased white paper. Steam two hours, the water boiling quickly all the time. The pudding may be served with a sauce, and is sufficient for six persons.

AMERICAN BLIGHT. Woolly aphis is another name for American blight, which has the appearance of small tufts of cotton wool on the trees. The insect protects itself with the fluffy white covering; when the latter is removed the pest is revealed as a small plump aphis-like body. It is a common apple pest, sucking the sap and so causing swellings or wounds which become the breeding places of other insect pests and fungus. In its earlier stages the blight can be got rid of by using a brush dipped in methylated spirit or paraffin oil, but in the case of larger cultures vigorous spraying or syringing will be required.



American Blight. 1. Winged female. 2. Wingless female an young. 3. Twig of an apple tree attacked by the aphis.

In winter an effective wash may be made up of soft soap, ½ lb.; paraffin (or solar distillate) 5 pints; caustic soda (98 p.c, purity), 2 to 2½ lb.; water, 9½ gallons. In summer use the following: Dissolve 20 oz. of soft soap in about ½ gallon of hot water. Make up to 10 gallons, and then add 1 lb. of Woburn Tobacco Extract. This should be applied with the aid of a small atomiser to each tuft of aphis.

AMMONIA: Its Household Use. Liquid ammonia is really a solution of ammonia gas in water. The strength usually sold is ten per cent., but a stronger kind is used by chemists. Liquid ammonia is poisonous. It is pungent to the nose and makes the eyes water when sniffed, and may injure permanently the sense of smell.

Ammonia is a strong alkali, and on this account is used as a cleansing agent. Added to the water in which articles are washed, it softens it in place of soda, and in cleaning windows, where soda is inadmissible, a little liquid ammonia added to the washing water is effective. Sponged on woollen cloth the colour is revived and grease spots are removed. It also revives the colour of carpets, and is excellent for cleaning tarnished silver. Ammonia often restores the colour to delicate fabrics like silks, especially where acid fruit stains have been the cause of discoloration. Brushes and combs are thoroughly cleansed from grease by a tablespoonful of ammonia being added to the warm water in which they are to be washed.

Cloudy ammonia is made by mixing common yellow soap, 8 grains; lavender water, 20 drops; solution of ammonia, 1 pint Cloudy ammonia is added to the bath as a refreshing and detergent agent.

Ammonia has stimulating properties which make it a valuable medicinal agent. Spirit of sal volatile, the form in which it is administered, contains both liquid ammonia and ammonia carbonate, with flavouring agents (lemon and nutmeg). It is a domestic remedy for nervous headache and faintness. The dose is a teaspoonful in a wineglassful of water. It must not be taken alone, as it causes a burning sensation in the throat.

Mindererus spirit is a solution of ammonia acetate. It is one of the oldest remedies for feverish conditions and promotes sweating. The dose is from one to two teaspoonfuls.

Poisoning. Strong solution of ammonia is sometimes taken in mistake for spirit of sal volatile, with serious effects. Ammonia is a corrosive poison, injuring the surface of the mouth, throat and stomach, in addition to which the vapour inhaled causes inflammation of the lungs. The treatment, which can be commenced while the doctor is being fetched, is to administer weak acids to neutralise the alkaline ammonia.

These are vinegar diluted with water, lemon juice and water, and tartaric acid or citric acid dissolved in water, in the proportion of a teaspoonful of the acid to a breakfastcupful of water. Then the patient should be given demulcent drinks such as milk, olive oil, white of egg.

AMMONIATED QUININE. Name of a popular remedy for influenza and cold in the head. The dose is half to one teaspoonful of the tincture in a wineglassful of water or milk. When mixed with water an opaque white liquid is produced, but if aerated water is used no whiteness results. A solid form of ammoniated quinine is made as capsules.

AMPERE. In electricity the name given to the unit of current or rate of flow of electricity. An ampère-hour is a current of one ampère flowing for one hour. *See* Accumulator; Battery.

ANAEMIA. This is the name given to a diminution of the whole blood or of some of its main constituents. In two forms, chlorosis and pernicious anaemia, the cause is obscure, and these are known as primary anaemias. When, however, a definite cause is ascertainable, we speak of a secondary anaemia.

Chlorosis. This form of primary anaemia is most frequently found in young women or in girls just approaching adult life. It is due to some abnormality in the formation of the blood, the chief deficiency being in the haemoglobin, or colouring matter in the red blood-

cells.

Not infrequently the sufferer is plump, or even fat. In typical cases the face has a yellowy-greenish tinge, which gives the disease its common name of green sickness. The disease, which is now comparatively uncommon, is one requiring medical attention.

Pernicious Anaemia. Whereas chlorosis is practically confined to girls and young women, pernicious anaemia is more frequent in men, and is commonest at about middle age. It is a very severe blood disease in which there is an active degeneration of the blood-cells themselves. Its predisposing cause is absorption of poison from a septic mouth or the stomach and intestines. It is considered that there is another poison of obscure nature and origin which breaks down the red blood-cells. In a serious disease like this, the patient must be under medical care as soon as possible.

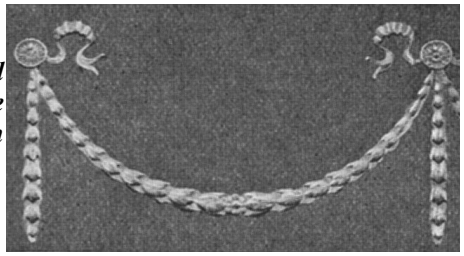
Secondary Anaemias. A quite mild type of anaemia, or "poorness of blood," is one of the commonest conditions to be met with among sedentary workers, particularly women and girls. The chief outward sign is an unnatural pallor. The lips, instead of being bright scarlet, are dull.

Before any cure of the anaemia can be expected, the cause must first be sought out and removed. If this is possible the anaemia will pass off by itself under the influences of plenty of fresh air and rest, an iron tonic, suitable food and general attention to the laws of health. If necessary, the mouth should be cleaned up.

Anaemia in Children. This is a much more common complaint than most mothers realize. Lack of fresh air and sunshine, too little outdoor exercise, and rapid growth in the child are among common causes. The diet on which literally millions of children are brought up in this country—bread and butter, cakes, sweet foods, potatoes, and other starchy vegetables, with tea several times a day—is in itself enough to induce anaemia of more or less severity. Bad teeth and the resulting constant pouring out into the mouth of "matter" or pus (which is swallowed and so tends to interfere with the digestion) are other not uncommon causes of anaemia in childhood.

While an iron tonic is an important part of any treatment, it is equally essential to find out and remove the cause of the deficiency in the blood. Sometimes a tendency to rickets or chronic constipation may be the source of the anaemia. In many slight cases more play outdoors, less study or other brain activity indoors, more sleep, and simpler and more nourishing dietary, with some chemical food, may effect a cure. *See* Baby; Child; Diet.

ANAGLYPTA. A form of wall and ceiling decoration which is termed anaglypta consists of a good quality pulp board pressed during the process of manufacture to form raised or embossed patterns. It is obtainable from the same sources as wallpaper. It is applied to the wall and fixed by a good adhesive paste, or flour paste with a mixture of glue. After fixing, it needs finishing with distemper in the case of a ceiling or cornice, or with paint or enamel if used as a dado (q.v.).



Anaglypta. Festoon used as a frieze decoration in Adam style.

ANCHOVY. The anchovy is a small fish of the herring species, chiefly used in a preserved form to make savouries and sauces. The foundation of these sauces is anchovy essence, which is made in this way: Take 1 lb. of preserved anchovies, 1 pint of cold water, ¼ pint of good vinegar, 1 saltspoonful of mace, and 1 saltspoonful of cayenne.

The anchovies must be reduced to a paste by pounding them in a bowl with a wooden spoon, and afterwards passing through a sieve. The parts which will not go through the sieve are then simmered with the mace, cayenne, and water. Simmer half an hour, strain, then mix with the pounded anchovy already in the bowl. Place the mixture back in the simmering pan, bring to the boiling point, add the vinegar and gently simmer for ten minutes more. When quite cold bottle for use. Anchovy sauce is made by adding one teaspoonful of anchovy essence to an ordinary white sauce or to ½ pint of melted butter. *See* White Sauce.

ANCHOVY BUTTER. Having soaked the preserved anchovies in warm water, dry and remove skin and bones. To six add 4 oz. butter and pound in a mortar. Rub through sieve and then pat the anchovy butter into shape. This is a savoury for sandwiches or toast.

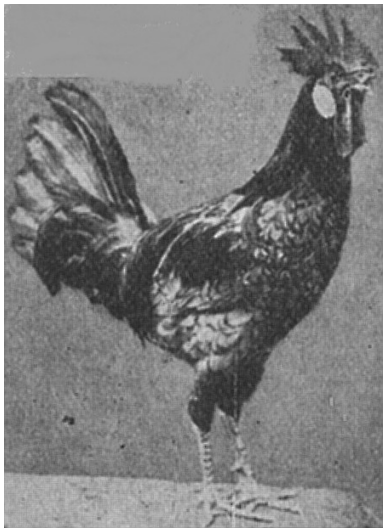
ANCHOVY EGGS. To make this cold savoury take as many hard-boiled eggs as are required, usually one for each person. Having shelled them, split them lengthways, and take out the pieces of yolk, which should be pounded in a basin with a small piece of butter, a tablespoonful of anchovy paste, some pepper, salt and a sprinkling of cayenne. Fill the eggs with the stuffing, and serve them garnished with parsley, cress, etc. The eggs may be made to resemble baskets by forming handles of parsley stalks.

ANCHOVY TOAST. Wash and bone six anchovies and chop them roughly. Heat one ounce of butter in a small enamelled pan, and fry in it a small onion, chopped finely. When the onion is lightly browned, add the anchovies, half a teaspoonful of chopped parsley, and the yolk of an egg. Season with cayenne. Stir this mixture till it thickens, then pour it on buttered toast and serve it very hot.

ANCHUSA. This is the name of a sturdy family of biennial plants somewhat resembling forget-me-nots, to which order they belong, but attaining a height of over 2 ft. They flower throughout the summer in sunny borders and need no special cultivation. Anchusas are raised from seed sown under glass in spring, and the seedlings are planted out in the usual way; or by root cuttings after flowering. Pron. An-kew'-za.

ANCIENT LIGHTS. Any person who has a window 20 years old and upwards acquires the right that no one shall block out the light from it in such a way as seriously to diminish the amount of light that penetrates into the room. This means for practical purposes: to enlarge the window does not enlarge the right of light.

If anyone is starting to build so as apparently to interfere with an ancient light, the owner should write at once and say in effect: "You have started building, and seem as though you were going to block up my window. I give you notice this is an ancient light, and await your assurance that you will not interfere with it." Failing such an assurance, a solicitor should be instructed to apply for an injunction. It must not be imagined that an ancient light gives the right to a continued uninterrupted view. The only right is to a fair quantity of light.



Ancona Fowl. Cock of good laying breed of poultry.

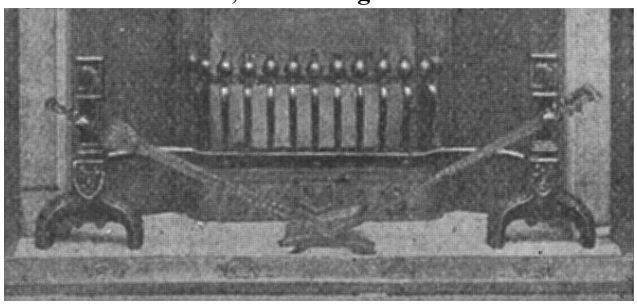
ANCONA. This fowl, of Italian origin, was introduced into England in the early fifties. It is of active habit, and better suited to an unlim-ited range than to confinement. A prolific layer of large white eggs, as a table bird it has few qualifications. There is a sub-variety, with a rose-comb instead of a single comb. *See* Egg; Fowl; Poultry.

ANDALUSIAN. This is one of the best egg-producing fowls. A native of Andalusia, in Spain, it compares favourably with other Mediterranean types, producing a large white egg. It is also a good table fowl, its flesh being of delicate flavour. Although thriving in confinement, it is better adapted to a wide range. *See* Egg; Fowl; Poultry.



Andalusian Fowl. Cock of good laying breed of poultry.

ANDIRONS. More generally known as fire-dogs, andirons were formerly used in open hearths for burning wood, each consisting of a stout horizontal bar of iron raised on iron supports a few inches from the ground. The front support was extended in an upright form and finished with a knob, shield, or other architectural device. The andirons were placed one each side the hearth, and the logs laid across the bars.



Andirons. Modern adaption of the old fire-dogs, now used to support fire-irons. Waring & Gillow, Ltd.

The modern adaptation of the andiron is to be seen in the fire-dogs, which are now used to support the fire irons. *See* Fire Irons.

ANDROMEDA. The most popular species of Andromeda is known to botanists as Pieris floribunda. It is an American evergreen, with leathery leaves and dense racemes of white flowers, appearing in April. The height is commonly 3 to 4 feet. Another beautiful species is Japonica, with tufts of creamy bells in abundance. There is a variety called variegata

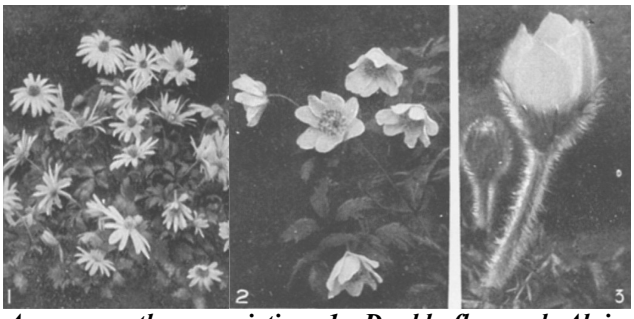
(or elegantissima).



Andromeda Japonica. Creamy flowers of the evergreen shrub.

The only true distinct species of Andromeda is polifolia, a shrub growing about 1 foot high with pink drooping flowers in late spring, and evergreen leaves, a native of our peat bogs. It requires a moist site and a peaty compost. Propagation is by seeds sown under glass when ripe, also by layers in autumn. The layers root very slowly. Andromedas thrive best in a position where they are not exposed to hot sun.
Pron. An-drommy-da.

ANDROSACE. Some of the gems of the rock garden are found in the genus of Alpines known as Androsace or rock jasmine. They are distinguished for the most part by dense habit, great profusion of bloom, and beautiful colours. Among the best varieties are the pink sarmentosa, Chumbyi with rose flowers, pink-flowered carnea, lanuginosa, and the scented blush pink villosa. They need well-drained gritty soil.
Pron. An-dros -er-si.



Anemone: three varieties. 1. Double-flowered Alpine Blanda. 2. Windflower, or wild wood anemone. 3. Violet Pasque flower or Pulsatilla.

ANEMONE. There are numerous species of the anemone or windflower. Two of these are British: Pulsatilla or the violet Pasque flower, and Nemorosa, which is the wood anemone. Coronaria, with its poppy-like flowers, white, purple, or scarlet, is an old garden favourite from six to nine inches high ; there are also double-flowered sorts. The Alpine blanda flowers from Jan. to April. The Snowdrop anemone or sylvestris is about 18 inches high and blooms in May. Fulgens and hortonsis have scarlet or purple flowers.

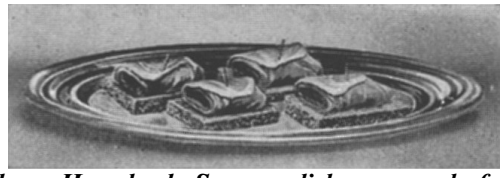
The flower gardener should procure a selected strain of mixed varieties. This will give him a beautiful range of colours and forms, including both singles and doubles. The seed is best sown in pans or boxes in a frame in spring. If spring bloom is wanted, tubers ought to be planted in autumn; a succession can be obtained by planting more tubers in spring. Japanese anemones may be planted any time between autumn and spring, and they thrive in most garden soils on a shady or sunny border.

The Japanese anemone is among the most beautiful of late flowering hardy perennials, the white varieties in particular. Apennina is sky-blue, with tuberous roots. The Hepatica type, both single and double forms, is blue. Pron. A nem'-o-ni.

Aneroid. *See Barometer.*

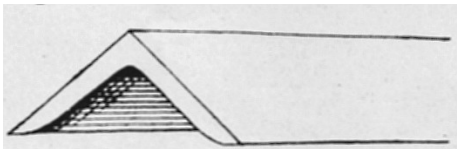
ANGELICA. Made from the stalks of the angelica plant, candied angelica is a beautiful shade of green, and is much used as a decoration for cakes, puddings, trifles, etc. Being pliable it can also used to give the effect of a handle to a sponge-cake basket filled with whipped cream and preserved cherries. *See* Crystallised Fruit.

ANGELS-ON-HORSEBACK. For this savoury dish take a thin slice of bacon for each oyster used, and an equal number of rounds of toast or fried bread. Season each slice of bacon by dipping it in a mixture of chopped onion, and cayenne pepper. Lay an oyster on each slice, sprinkling a little lemon juice over it. Wrap the bacon tightly round the oyster, fixing it with a small skewer made of the wooden part of a large match. Fry till the bacon is quite crisp, then serve on the rounds of toast.



Angels-on-Horseback. Savoury dish composed of oysters and bacon.

ANGLE-IRON. An iron bar bent to form a right angle longitudinally is called angle-iron, and the shape greatly increases the strength and rigidity of the bar. Angle-iron may be had from bar-iron dealers or retail from a blacksmith in sizes 1 in., 1¼ in., 1½ in., 2 in., and 3 in., and is sold by weight.



Angle-Iron in section and perspective.

ANGLE TEMPLATE. An angle template is used for marking and testing angles on metal, and other materials. The most commonly used are 45°, 30° and 60°, but when necessary templates are made for any other angle. For use in picture-framing a 45° template is useful, but others are necessary when setting out the angles for hexagonal shapes and other types of frames.

Angle templates are commonly used in building for roof work and other purposes, and in such cases they are made to a large size and framed up with strip material. *See* Roof.

ANGORA RABBIT. One of the most attractive of rabbits, the Angora is conspicuous by its long coat of fine silky wool, either white, grey, fawn, blue, or black in colour. The does are good mothers and being very tractable, are among the most popular rabbits kept as domestic pets. When full grown and in good condition the Angora weighs about 7 lb. *See* Rabbit.

ANILINE DYES: For Domestic Use.

Various dye soaps are made with which the dyeing process is accomplished in one operation. A base of equal parts of powdered soap and bisulphate of soda is employed, and to this is added the aniline dye required. Generally the proper shade is obtained by combining two or more dyes. In another variety the soap is mixed with boric acid instead of bisulphate of soda, and aniline dye added in the proportion of 1 lb. to each cwt. of soap base.

Aniline dye stains are often difficult to remove. Aniline typewriting ink is removed by applying tartaric acid or lemon juice.

ANILINE INK. The great variety of aniline colours makes these suitable for the manufacture of coloured inks. A simple solution of the dye in water is generally required, and although some recipes order the addition of gum-arabic, this is not generally necessary. For red ink, the best colours to use are eosine, erythrosine, phloxine and ponceau scarlet. For blue ink, soluble blue or indigo carmine. For violet ink, acid violet: and for green ink. malachite green. The proportion of each dye required is one dram to six or eight ounces of water. The ink used for copying-graphs consists of methyl violet 1 oz., dissolved in alcohol 1 oz., water 9 oz. Typewriter ribbons are coloured with an ink of similar composition.

These inks may be used for home dyeing. Red ink sufficiently diluted tints silk under-clothing a delicate pink. It is as well to wear rubber gloves when using inks for dyeing, or to remove the articles from the dyeing water with two sticks and rinse well before touching.

ANIMALS: The Legal Aspect. Sometimes a neighbour objects to noises made by animals such as cocks and dogs. Anyone is at liberty to keep on his own premises any animal he chooses so long as it is not a nuisance to his neighbour. A nuisance is something which interferes with the neighbour's reasonable, enjoyment of his own property.

What is reasonable depends on time and place in a great measure. A man living in the country must expect his neighbour to keep fowls, but a man in the centre of London is entitled to object if his sleep is disturbed by the crowing of cocks in his neighbour's garden. An action for an injunction is the legal remedy for such nuisances. One must not keep animals on one's premises so as to be injurious to health.

Anyone who keeps a dog which he knows to be accustomed to bite human beings is liable if his pet bites anybody. As to a dog worrying sheep or baiting cattle, horses, or pigs, the dog owner is liable whether he knew or did not know that the beast was ferocious.

Cruelty to animals in captivity or domestic animals is an offence. It is cruelty to cause or permit unnecessary suffering, or cruelly to beat, abuse, infuriate or terrify the animal. In the case of a wild animal, imprisonment for three months, with or without hard labour, or a fine of £5 or less; and of a tame animal, three months or a fine up to £25 is the penalty. S*ee* Cat; Dog; Rabbit. etc.

ANISEED. As a cough remedy aniseed is much used on account of its soothing effect, generally in the form of a balsam, which is made as follows:

Liquorice juice	1 ounce
Ipecacianha wine	½ „
Oxymel od squills	4 ounces
Oil of aniseed	20 drops
Treacle	1 pound
Gum-arabic	1 ounce

First boil the liquorice juice and gum-arabic (both broken up into small pieces) in half a pint of water, then add the treacle. Allow it to cool, and add the other ingredients, adding sufficient water to make two pints. The dose is one or two teaspoonfuls three times a day.

Aniseed syrup, given to children for wind, is made by adding one drop of oil of aniseed to two ounces of syrup. The dose is a teaspoonful.

Aniseed cordial, used by adults as a stomach cordial, is made on similar lines, but is stronger in aniseed, and contains a fair proportion of alcohol. It is taken neat or mixed with hot water.

ANKLE. The ankle is a hinge joint, the two main ligaments binding the bones together being the internal and external lateral ligaments. These are torn in injuries to the ankle, which stretch them, and especially in those which displace the bones to any extent.

For treatment, a sprain requires the application of cold cloths and elevation of the joint on a pillow. In fracture or dislocation the foot is placed as far as possible in correct position by pulling it downwards,

and well-padded splints are fixed on the outer and inner sides of the leg, reaching from above the knee to below the ankle. The two legs are then tied together and placed on a pillow. A bed-cradle may be used to take the weight of the bedclothes off the toes of the injured limb. This will suffice till the doctor arrives.

The proper reduction of a fracture-dislocation of the ankle requires special manipulative skill and in first aid only gentle handling is perminsible.

In sprains, as soon as the acute symptoms have moderated, perhaps after three or four days, the parts should be massaged, and as the swelling subsides gentle movements are performed. In cases of slighter sprains, after two days the patient may be able to get about a little. This after-treatment is very necessary, otherwise a troublesome stiffness of the joints may persist.

Care of the Ankles. Choice of footwear is important to ankle slimness. Heels of more than 1 to 1½ in. in height should not be worn for walking. High heels, by forcing the foot into an unnatural position, strain and cramp the flexibility of the ankle joint. Weak ankles are subject to swelling, and to remedy this condition remove shoes and stockings on returning home, apply a cold compress to the joint and then, lying down, raise the foot on a cushion. Afterwards lightly massage the ankle and apply methylated spirit. Heels of shoes should be repaired at the first sign of crookedness. Boots should not be worn habitually, except by medical advice, as they provide too much artificial support.

Anaemia may be responsible for swelled ankles; or, in children, they may accompany a tendency to flat feet, and are a sign of general debility. Sunshine, fresh air and a bone-and muscle-building diet are of importance. Paddling in the sea during the summer holidays is beneficial, as salt water has tonic properties.

Skipping and dancing barefooted or in flat-heeled shoes strengthen the ankles, and the following simple exercise imparts flexibility:

Stand with feet close together, toes as well as heels touching, knees braced back and the balance on the balls of the feet. Raise the body on to the toes and hold the position for a moment, then lower the heels. Repeat short series of the exercise several times during the day when convenient to discard heeled shoes. *See* Beauty Culture; Dislocation; First Aid; Flat Foot; Foot; Fracture; Sprain.

Annealing. See Tempering.

ANNUALS: In the Flower Bed. Including what are known as half-hardy annuals which require more care and attention, the range of annuals is a wide one, with a great variety of beautiful colours. Few plants provide a more charming pink groundwork for a bed of white tulips than campion or soapwort. Virginian stock with its slim stems and abundance of mauy pink and white flowers is just as useful, and blooms in spring if sown in August or September; so also do Californian poppies. Some special favourites are cultivated in the same way, although they are not true annuals, as, for example pansies, lobelias, petunias, verbenas, Indian pinks and the antirrhinum or snap-dragon.

While chrysanthemums and other half-hardy annuals are raised in seed-boxes, it is rare for the hardy kinds to be sown under glass and transplanted. Mignonette and Everlasting flowers do not transplant well. A dozen seeds of each may be sown in 5-in. pots, and the resulting seedlings thinned down to three and five respectively. In many cases gardeners grow most of their annuals in groups, perhaps along the front of mixed borders.

Ageratum, alyssum, campion, violet cress, soapwort, and Virginian stock should be from 2-3 in. apart. For lupins, double poppies, sunflowers, and tobacco plants the distance is from 18 to 24 in. The following are set at 4 to 5 in. apart: Arctotis, Californian bluebell, candytuft, convolvulus minor, cornflower, gilia. Indian pink, limnanches, lobelia. mignonette, phlox (annual), sweet pea, horned poppy, and Venus's looking-glass.

A distance of 9 to 12 in. apart is required for the following: China aster, chrysanthemum (annual), clarkia, coreopsis, godetia, larkspur. love-in-a-mist, love-lies-bleeding, marigold, dwarf nasturtium, evening primrose, petunia, poppy, Prince's feather, salpiglossis, scabious, sweet sultan, verbena, and the zinnia. A remarkable annual recently introduced is the orange-coloured venidium fastuosum; seed is sown under glass in March. *See* Border: Flower Garden.

ANNUITY. An annuity in the ordinary sense is a yearly income paid to a person for his or her life. It can be purchased, by those who wish to provide for their old age or for the old age of those dependent upon them, from any insurance office or from the State through the Post Office; the price varies according to the age and sex of the person for whose benefit it is bought. The older the person the cheaper the annuity. Annuities for women cost more than those for men of similar ages.

In addition to annuities of this kind, which are the usual type, there are perpetual annuities, i.e. a charge upon an estate which is paid to a person and his heirs forever. Terminable annuities are annuities issued by the Government in order to pay off the National Debt.

An annuity can be bought by a single payment or on the instalment plan. The table in the next column shows the amounts payable to secure a Post Office annuity of £50.

From the figures the amount necessary to secure an annuity of £100 or any other income can easily be ascertained. The State pays on death a sum which is equal to one fourth part of the annuity.

The amount charged for an annuity by the insurance offices varies. For instance, a man of 60 can purchase with £100 an annuity of £7 19s. from one

office, while another will give him as much as £8 8s a year. The variations are due partly to the class of business done by the various offices and partly to some slight differences in benefits. For instance, some insurance offices pay the whole or part of the stamp duty, which is charged on annuities. Those wishing to purchase an annuity should remember that the main object is to obtain a secure income, and therefore only deal with the State or with an ofice whose reputation is sound. *See* Insurance.

Price of 2½% Consols: e.g.	*74 -77*	*77 -80*	*80 -83*
	£	£	£
MALES: aged 55	712	721	730
„ 60	611	618	624
„ 65	514	519	523
„ 70	422	426	429
FEMALES: „ 55	810	821	832
„ 60	712	720	729
„ 65	609	615	621
„ 70	502	506	511
JOINT annuities, man and woman : both aged 55	922	935	949
„ „ 60	819	829	840
„ „ 65	711	719	726
„ „ 70	599	604	609

(These sums are approximate)

ANT: How to Destroy the Pest. These little insects often prove very troublesome in the garden by their attacks on ripe fruit. They will swarm upon ripe strawberries, and an apple or plum whose skin has been pierced by a bird's beak and an apple or plum whose skin has been pierced will be hollowed out by them. If the direction of the stream of ants is followed, they can he tracked to their nest, and this should he forked up and dusted liberally with air-slaked lime. As many of the inmates will be in the chrysalis stage and protected by tough cocoons—the so-called "ants'-eggs" - the operation must be repeated several times at two-day intervals. Kerosene oil, diluted with six or seven times its bulk of water, and carbolic acid, in water ten times its bulk, are equally effective.

Where ants have invaded the house the problem is more difficult. The principal offender is a minute reddish-yellow species, a twelfth of an inch in length, which finds its way, through cracks in the floor or skirting, to the pantry, and takes toll of meat, pastry, jam, and dripping. Here the use of any strong-smelling deterrent like carbolic or paraffin is liable to make the food uneatable. So far as possible all crevices should be sealed with putty or cement, and a watch kept for for the new entry these insects are certain to attempt.

It is, of course, very dangerous to lay poison anywhere in the neighbourhood of food. A simple syrup sufficiently viscid to clog the ants' limbs will serve as a trap, from whih the insects can be plunged into boiling water. The syrup may also be made to kill by adding a few drops of formalin.

Ant bites are treated by the application of ammonia (q.v.), sal volatile, solution of permanganate of potash, or a strong solution of common salt. *See* Insect.

ANTHRACITE STOVE. The modern anthracite stove, designed to burn on the closed or open fire principle, provides more heat than any other solid fuel, and maintains a continuous fire day and night at a surprisingly economic cost. It obviates the drudgery of daily re-laying and lighting, and the total absence of smoke and soot makes for health and comfort.

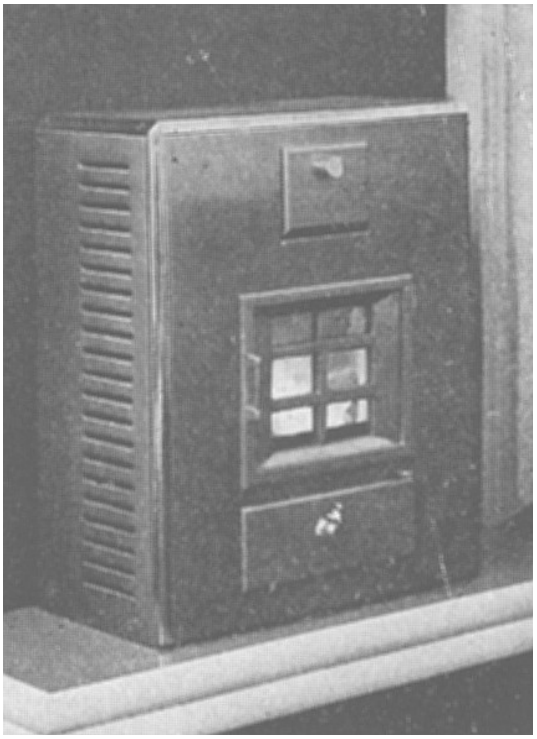


Fig. 2 Anthracite cooking range. The two ovens are kept at different temperatures.

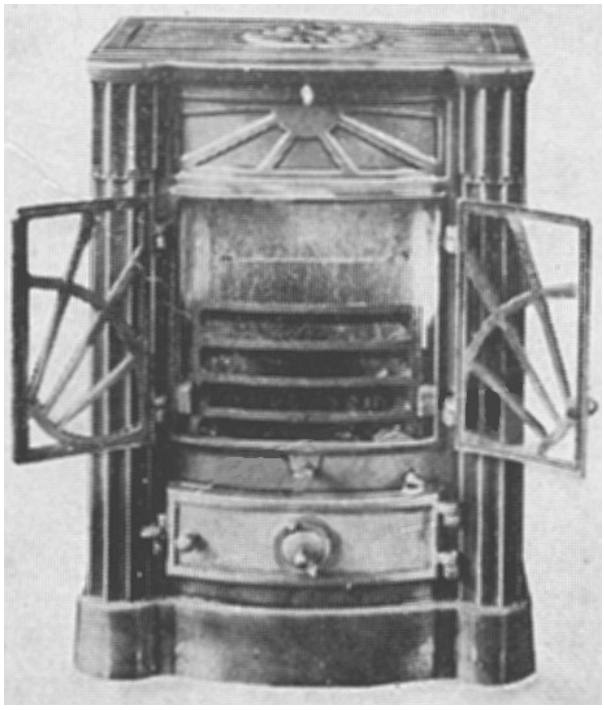
Fig. 2 shows an anthracite cooking range having two ovens with different temperatures, controlled thermostatically. The heat from the burning anthracite is conveyed to the ovens and the top-plate, which are carefully insulated to prevent waste of heat. The fuel costs about 4d. for 24 hours. Some of the rangers are provided with pressure boilers for the domestic hot water supply.

An anthracite stove for use in sitting rooms is shown in Fig. 3. This is the closed type, with a small filling door above the fire door, into which the end of a tapered coal hod may be inserted, so that the fire door need not be opened. It requires to be filled only once every twelve hours. The ash is shaken down and need not be removed oftener than twice a week. As the

heat is made to pass through tubes before it enters the chimney, the wastage is practically nil. These stoves will burn coke nuts satisfactorily. In another kind, in which there is an open fire, very small anthracite ("peas") is the fuel.



Anthracite Stove. Fig. 3. Closed type, for the hall or sitting-room. (Smith & Wellstood, Ltd.)



Anthracite Stove. Fig. 1. Open fire model, with doors for night burning. Suitable for rooms 14 to 18 feet square. (London Warming Co.)

Fig. 1 shows another kind of anthracite stove, which always gives a bright fire, whether open or closed. There is no danger of fumes escaping into the room and, by means of a damper at the top of the stove, the fire can be perfectly controlled.

Sizes of Anthracite. Various stoves need various grades. For most purposes, Boiler Nuts are cheapest: they are about as big as walnuts (¾ in. to 1¼ in.). In small heating stoves, grain-size is preferred. Anthracite at 75/- per ton burning 24 hours costs less than 5d. a day, as compared with ordinary coal at 52/- burning only 15 hours and costing over 8d. a day. Use only pure anthracite: bituminous substitutes burn noisily.

ANTIDOTE. Substance which neutralises or counteracts the effects of poisons. A list of the appropriate antidotes is given under the heading Poison.

ANTI - FREEZER. To prevent water freezing in radiators of motor-cars, household radiators, and in the generators of acetylene gas, certain substances are added, and from their action in lowering the freezing-point, these are known as anti-freezers. The substances employed are glycerine and liquid glucose, the proportion required of either being 32 oz. to each gallon of water. *See* Radiator.

ANTIMONY. Apart from its value in the making of type metal, one of the chief uses of antimony is in the preparation of the Britannia metal and pewter (q.v.) employed for making teapots, coffee-pots, spoons, and other domestic articles. It is also used for trinket boxes, dressing-table trays, and ornaments. It does not tarnish and can be kept clean by simply washing with soap and water. *See* Poisoning.

ANTIQUE FURNITURE IN THE HOME

Notes for the Amateur on Its Collection and Care

Details of Styles and Pieces are given under Chair; Chippendale; Hepplewhite, etc.

English furniture is divided into the four periods of oak, walnut, mahogany, and satinwood, many examples of which can be seen in the Victoria and Albert Museum, South Kensington. In the reign of Elizabeth, ornamental carving was employed for four-post bedsteads and tables. A reaction set in, mainly under the influence of Inigo Jones, when upholstered furniture came into fashion.

Hampton Court Palace has good examples of the furniture of the later Stuart period. This was the time of the gate-legged table, also of the "drawinge" table, one with a contrivance by which the two ends were drawn out for the purposes of expansion. Chairs had carved backs and seats with panels of canework which were often covered with loose cushions of velvet; bedsteads had rich hangings of silk and velvet, and a good deal of luxurious furniture, carved, gilt and upholstered, was imported from Venice and the

Netherlands while lacquer from the East came into fashion.

With the accession of William III, walnut began to replace oak. Dutch furniture was brought over to England, and lacquered cabinets from China and Japan. Marqueterie, which may be defined as an inlay of coloured woods, came into vogue as a decorative treatment for surfaces of furniture, such as doors of cabinets, the drawer fronts of chests of drawers, clock cases, and the tops, sides, and fronts of the smaller pieces. The curved or cabriole leg was introduced from Holland for chairs and tables; ebony and silver, with ivory and mother of pearl, were also used in inlay. Chairs and window seats were covered with beautiful needlework.

Queen Anne and Chippendale Styles

Grandfather clocks, their cases inlaid with marqueterie flowers and birds, and also with a more delicate pattern of stained holly-tree wood, termed "seaweed marqueterie," on a groundwork of walnut, are of Queen Anne's time. Card tables with cabriole legs, sometimes carved with a nulled edge and a shell ornament on the knees of the legs, belong to this time, as do handsome cabinets, presses, and chests of drawers decorated with marqueterie or with different veneers of walnut arranged in geometrical designs. A peculiar and very beautiful feature of some of the Queen Anne walnut furniture is the veneer known as "oyster shell," which has a natural marking of the wood resembling the shell of the oyster; it was obtained from boughs of old and matured trees.

The name which stands out most prominently as a maker of mahogany furniture from the middle of the 18th century is that of Thomas Chippendale, but the first designer to use mahogany was William Kent, whose best work was done between about 1735 and 1740. Thomas Chippendale was established as a chairmaker in St. Martin's Lane about 1754. His rococo style lasted until nearly the time of his death in 1779. Chippendale should be taken more or less as a generic term, for it is impossible that a hundredth part of the old furniture of this time and style could have been produced in his workshop. Gillow made a good deal of the so-called Chippendale furniture, and his book of designs, which were available to every contemporary cabinet maker, furnished the patterns adopted by many craftsmen whose names are now forgotten. Hepplewhite's designs come a little later than those of Chippendale an are more severe, generally in good taste, and his work is invariably well constructed. The decoration of chairs and settees by beautifully executed japanning was also a particular speciality of Hepplewhite's.

Sheraton and the Adam Brothers.

The name of Sheraton looms large in the history of furniture, but his work more properly belongs to the age of satinwood. The influence of Robert and James Adam, particularly the former, towards the end of the 18th century must be borne in mind, as the Adam style was a distinct reaction from the rococo ornament of Chippendale to the more classical lines of design.

Satinwood came into use towards the end of the 18th century, being generally used as a veneer. The lines of satinwood furniture did not differ from those followed by mahogany, but this dainty wood suited smaller articles.

The following table of dates, corresponding with the various periods of British furniture making, will serve as an aid to the identification of the different styles:

Elizabeth, 1558-1603	"Elizabethan (Tudor)"
James 1, 1603-1625	"Jacobean"
Charles 1, 1625-1649	"Jacobean"
Commonwealth, 1649-1660	"Jacobean"
Charles II, 1660-1685	"Jacobean"
James II, 1685-1688	"Jacobean"
William and Mary, 1689-1702	"Queen Anne"
Anne, 1702-1714	"Queen Anne"
George I, 1714-1727	"Queen Anne"
George II, 1727-1760	Chippendale's work, about 1754
George III, 1760-1820	Hepplewhite's work, about 1780. Adam Bros' work, about 1780. Sheraton's work, about 1791.

There are at least two courses open to one who has decided to collect old decorative woodwork for pleasure or profit. The first is to employ an expert whose daily experiences render him difficult to trap. The other and more fascinating course is that of collecting personally. It is, however, better, until experience in the little ways of the sale room has been gained, to enlist a dealer of repute and pay him 5 p.c. for purchasing. It is a good plan to examine thoroughly old pieces on sale in the auction marts—to watch their sales before attempting to buy personally.

Obviously there are several degrees of faking or imitating. The piece in its entirety may be an absolutely modern copy of an old specimen ; it may be a copy made so many years ago that it has acquired a certain amount of patina and wear and tear; or it may be, in part, genuinely of the period.

The steady appreciation in value of old decorative furniture offers irresistible temptations to the maker of pseudo antique woodwork. It is an important weapon in his armoury to increase the value of plain but genuine old pieces by ornamenting their surfaces with the detail of the period. Formerly the process revealed itself by incongruity or over-elaboration of detail, but the carver of today often produces work instinct with the spirit of the past. Jacobean, Queen Anne and Chippendale furniture all lend themselves to carving. Genuinely old pieces have their carving skilfully restored by lowering the ground.

The modern cheap copyist of Chippendale usually stints himself in the thickness of his wood, and is therefore unable to obtain the relief and depth of the original in his carving. No such complaint of undue reticence in his use of fret-cut veneers glued

together can, however, be made. He regards these as the hallmark of Chippendale, and applies them to plain friezes, chair legs, and other vacant spaces (leaving their edges unfinished) with a prodigality undreamed of by the master whose fret-cut work was finished by the carver.

Detecting the Copyist

Inlaying and veneering are necessarily confined to "Queen Anne" pieces or to the periods identified with the brothers Adam, Hepplewhite and Sheraton. However skilful the modern inlayer and polisher may be, the soft mellow tone effected by time cannot be attained, whilst the veneer used is seldom so rich yet subdued in tone—or so fine in figure—as the old mahogany or walnut.

Over-elaboration is the pitfall of the imitator of these periods; he endeavours to atone for his inability to obtain the finely figured veneers of the originals by lavish use of vases, paterae, shells, lines, or other details of the typical style.

The black-stained, cheap, antique oak, ornately carved, deceives few nowadays. The colour of genuine old Stuart furniture is almost invariably warm, and differs radically from the dead tones of the black imitations. Its fine patina is better imitated by brown fuming.

Antiques are specially liable to the insidious attacks of the wood worm (q.v.). (*See also page 36*)

ANTIRRHINUM. Snapdragon or antirrhinum is a true old English plant. It was originally a wall plant. Modern cultivation has raised its height from six or nine inches to two feet or so, diversified and multiplied its colourings and increased the size of the individual flowers.

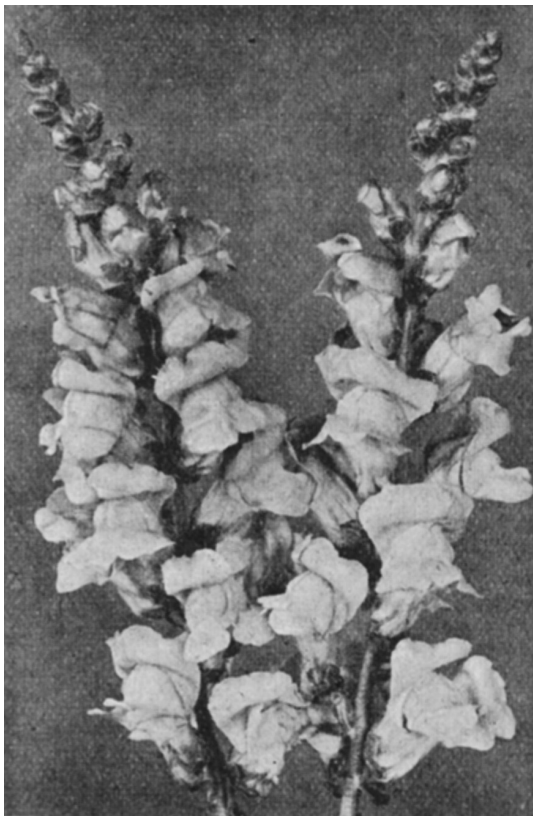
While, strictly speaking, a perennial, the snapdragon is often at its best if treated as an annual or biennial: the plants can be raised (1) from seed, sown in August where they are to flower, under the protection of a south wall, and thinned out in the following spring; (2) sown in open seed-beds in exposed positions in June, and planted out during the early months of the next year; or (3) sown in a heated greenhouse in February, the seedlings being planted and out of doors in May. The snapdragon can also be propagated by cuttings.

Among the tall sorts, growing from 3 to 4 feet in height according to the nature of the soil in which they are planted, the following are noteworthy:

White King (pure white), Yellow King (strong-growing deep yellow), Crimson King (deep velvety crimson), Cottage Maid (pink and white), Moonlight (apricot yellow flushed with red), Vermilion Brilliant (orange scarlet), Pink Beauty (rose pink), Venus (delicate pink), Nigrescens (dark crimson).

The following are twelve fine intermediate varieties (18 to 24 in. high):

White Beauty (pure white). Yellow Queen (large yellow flowers), Amber Queen (canary yellow, flushed pink), Bonfire (orange buff), Carmine Queen (rose carmine), Coccinea (orange scarlet), Cottage Maid (pink and white), Fascination (pink), Fiery Belt (orange red with white tube), Nelrose (deep rose pink), Nobile (white and crimson). The Fawn (terra-cotta and pink).



Antirrhinum. Intermediate variety of this old-fashioned English garden flower. (R.A. Malby)

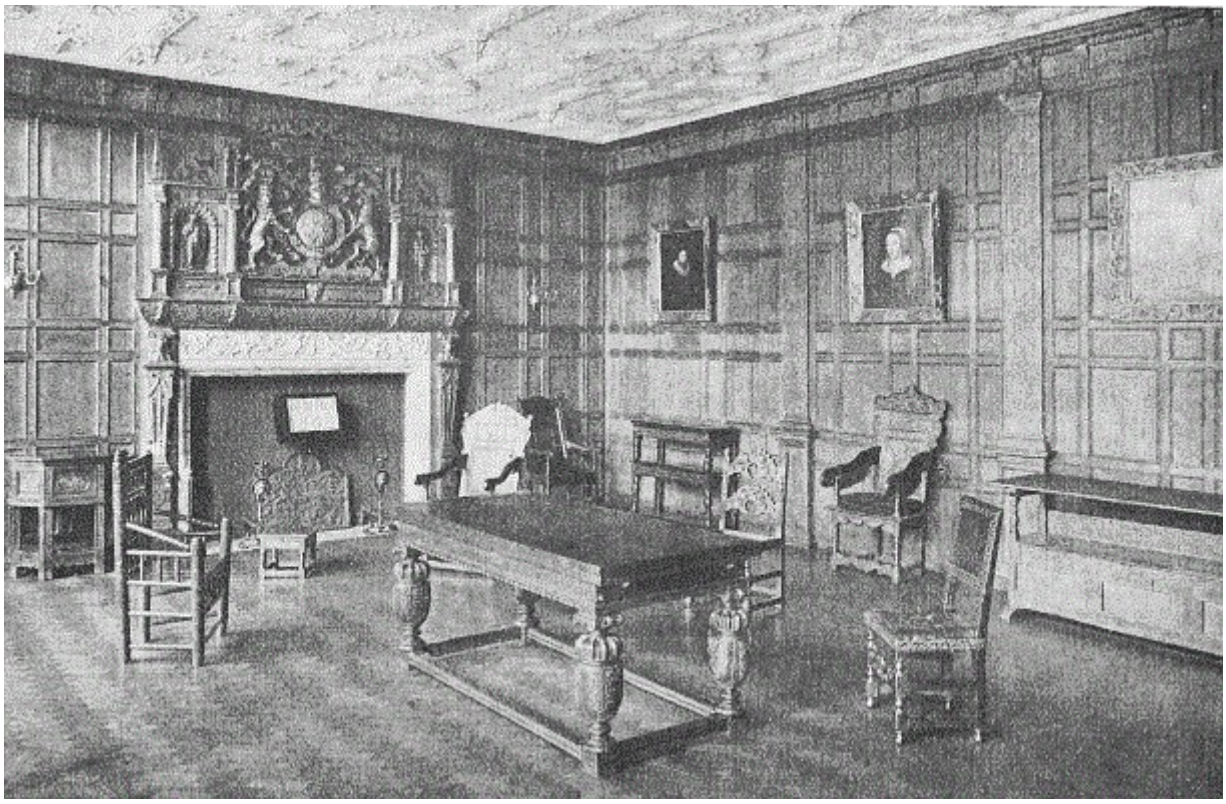
Most seedsmen have their own named varieties. The tom thumbs (about 12 in. high) are generally grown under colours. Most of these choice varieties must be treated as annuals or biennials except in the favoured districts of the south and west of England, where they often establish themselves permanently.

Bedding antirrhinums are largely planted instead of the tom thumb varieties: they grow from 10 or 12 inches high and make a brilliant show, as most of the flowering shoots are of uniform height.

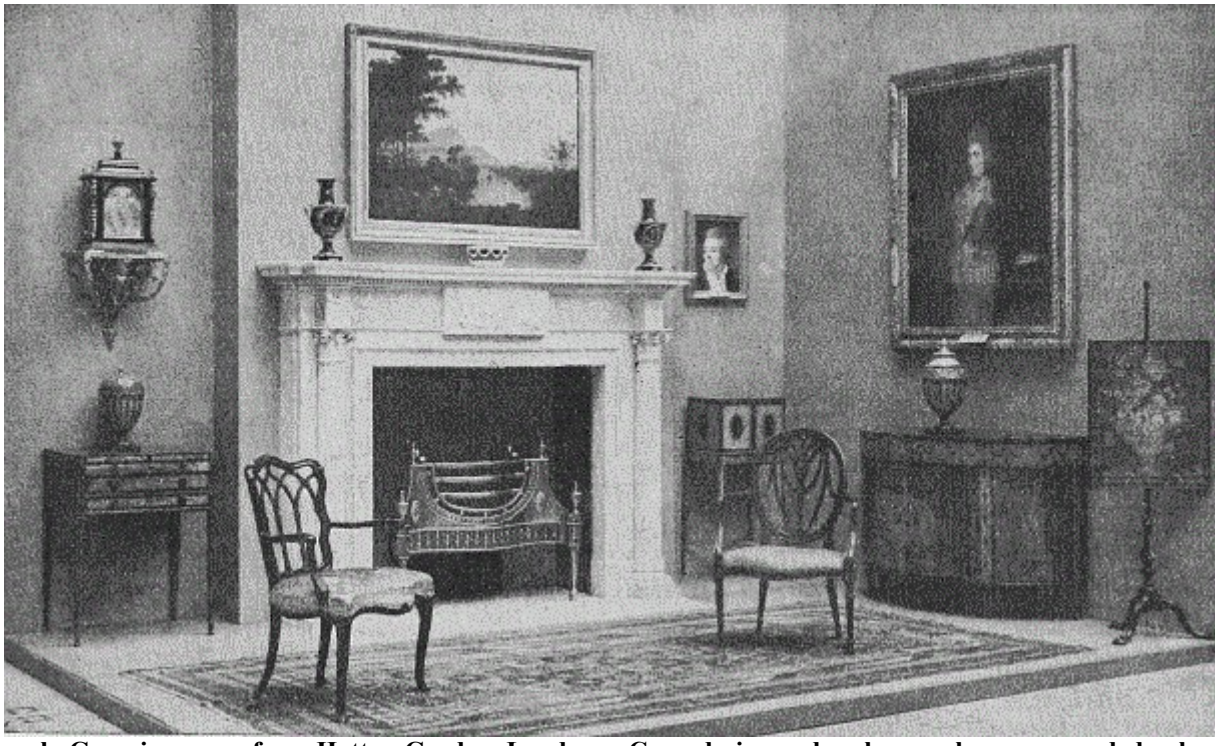
If sown in summer and planted in well-drained soil in sheltered places in September antirrhinums will stand most winters and flower a month earlier the following year than spring-sown plants. They are then biennials. When treated as annuals they are generally sown in February in boxes in a greenhouse where there is a gentle heat, or in a heated frame; germination is then rapid.

The most difficult stage in culture is before the seedlings obtain their second leaves. Then they are liable to damp off or to be scorched out of existence by strong sunshine unless carefully looked after. When the plants are big enough to handle easily they must be transplanted 2 to 2½ in. apart, into other boxes or frames where they will grow till planting-out time,

(Continued in page 37)



A room with panelling brought from the Old Palace at Bromley-by-Bow. Chronologically Jacobean, with a Jacobean ceiling, it is mainly Tudor in style with florid carving, chimney piece with family heraldry, royal arms and date, an extending table, and numerous panel-backed chairs.



An early Georgian room from Hatton Garden, London. Carved pine and mahogany have superseded oak and walnut. The furniture has the paw-like feet, curves and delicate rococo ostentation of the Kent period; but the classical lines of the fireplace and the simpler hoop-backed chairs and veneered cabinet anticipate the age of Chippendale, Hepplewhite and the Adam brothers.

ANTIQUE FURNITURE EXAMPLES OF FURNISHED ROOMS OF THE 17TH AND 18TH CENTURIES
Victoria and Albert Museum

being gradually hardened in view of this.

Planting or transplanting in the open beds in borders should take place in April or early May. If in lines, the intermediates ought to do well at 12 in. apart, the talls at l5 in., while the tom thumbs require 9 in. After the first two have grown to a height of 6 or 8 in. each plant must be staked, 12 in. stakes for intermediates and 18 in. stakes for talls. Pron. An-ti-ri'-num.

ANTISEPTIC. The chief use of an antiseptic is to prevent the growlh of organisms which cause putrefaction. Disinfectants (q.v.) have a different purpose. They are used to kill the microbes which cause communicable diseases like diphtheria or enteric fever. Some substances are both antiseptic and disinfectant, but a solution of sufficient strength to suffice for the former use would not serve for the latter. A deodorant (q.v.) removes disagreeable odours due to decomposition, but it, may do this without making things safer, e.g. in the case of eau-de-Cologne, camphor, or tobacco smoke. Some of the commonest antiseptics are:

Perchloride of mercury (corrosive sublimate).

Biniodide of mercury.—Solutions in water of strength 1 to 1,000 or 2,000.

Carbolic Acid.— In water, 1 to 20, 40, or 60. In mixing the water should be hot.

Tincture of Iodine.— Can be painted on or used as a lotion, a teaspoonful to the pint of warm water.

Potassium Permanganate. — Dissolve sufficient grains in water to produce a solution of a port wine tint.

Solution of Potassium Permanganate B.P.— A tablespoonful in a pint of water.

Hydrogen Peroxide Solution.— Diluted with five parts of water, this makes a good mouth wash, and is used in pyorrhoea.

Compound Glycerin of Thymol. B.P.C.— This makes a useful mouth wash.

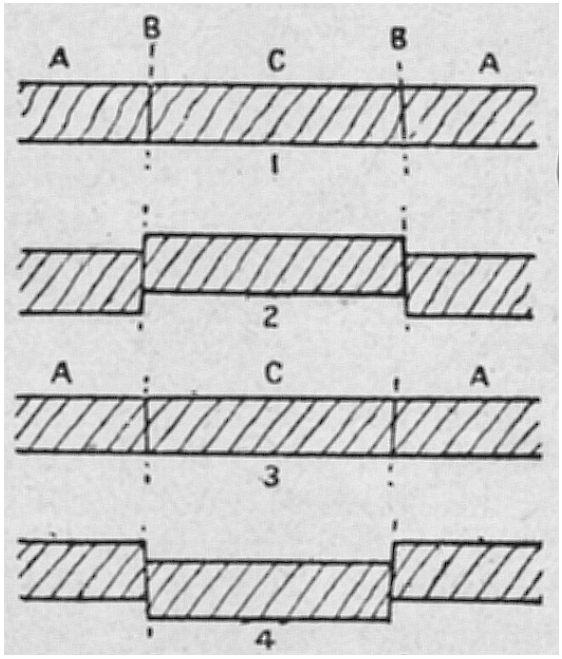
Boracic Acid.— A saturated solution (obtained by mixing an excess of the powder in warm water and pouring off the clear solution). This can be used as a lotion, gargle, or mouth wash. For an eye wash dilute the above with five parts of warm water.

Cresol Soap Solution or Lysol.— A teaspoonful in a pint of warm water.

Perchloride and biniodide of mercury are very poisonous, and if sold dry, to make the solutions, should be in the form of coloured tablets, which will tint the water and prevent their being drunk in mistake for water. Tablets of perchloride of mercury are sold, which are blue, and biniodide of mercury red. Antiseptics are useful internally, e.g. for fermentation in the stomach, diarrhoea, enteric fever, dysentery, etc., but should only be employed in this way under the direct supervision or instructions of a doctor. *See* Sanitation.

ANTLER MOTH. This is a greyish-brown moth, with an expanse of wing varying from 1¼ in. to 1½ in., the female exceeding the male in size. The caterpillar feeds below the surface of the ground on the roots of grasses. In this way it frequently becomes a scourge, rendering acres of grassland, as well as smaller lawns, useless. Although it occurs throughout the British Islands, its devastating work is largely confined to the northern districts. The only remedy for its attacks is the encouragement of rooks, lapwings, and other insectivorous birds that have a bill fitted for digging up the caterpillars. The caterpillars' activities extend from March to June, and the moths fly by night in August and September.

ANTOFRET. Antofret is a form of woodwork decoration by which it is possible to create raised and sunk panels and other features without employing more than a single thickness of wood for the whole. The cutting of the wood is executed with a hand fretsaw or a treadle fret machine.



Antofret. Fig.s 1-4. Diagrams illustrating principle on which sunk or relief patterns are done.

The basic principle is_that all the pattern lines are cut to a slight bevel. Fig. 1 shows a section of a piece of thin wood; the bevel cut of the fretsaw is indicated by the thin lines at B. If the interior panel C is cut out all round at the bevel shown, it will be found to fit loosely in its surrounding wood by virtue of the loss of the thin line of sawdust which has been cut from the path of the saw ; therefore, the section C can be pressed upwards until it tightens on the surrounding wood of A as shown at Fig. 2, and thus a raised effect is secured.

Similarly, if the bevel is in the opposite direction, as at Fig. 3, the central part C is depressed and produces a sunk panel, Fig. 4. This principle may be applied to any shape either of a raised sunk panel or of a formal floral decoration.

In practice the work itself is placed on the slant and the fretsaw is kept in a vertical position throughout the cutting. For this reason Antofret is best done on a

machine with an adjustable cutting-table which can be tilted to any angle as well as used for horizontal work. Fig. 5 shows one of these adjustable tables in use. A is the table, B the wood, and C the saw blade fixed in a hand frame in the position of cutting. The card tray in Fig. 6 gives a good idea of the solid effect which can be obtained from one piece of wood. The rim is made by pressing up the various steps of wood, and the sharp corners shaped down by filing and sandpapering. In the diagram of a section through the tray, the various steps are marked off, A, B, C, etc. An embellished diamond in the centre, also shown, is an additional improvement.

After the Antofret panels have all been cut each must be secured with glue. The parts should be pressed out to their final position and the glue applied on the reverse side to the face in the right angle made by the raised rings, etc.

Antofret is frequently used in combination with ordinary fretwork. There exists a large number of specially printed designs which may be obtained from Hobbies, Ltd,. Dereham, Norfolk. *S e e* Fretwork; Woodcarving.

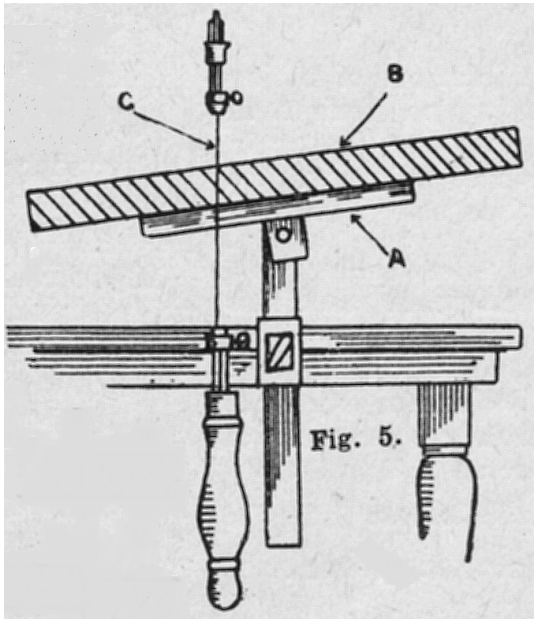
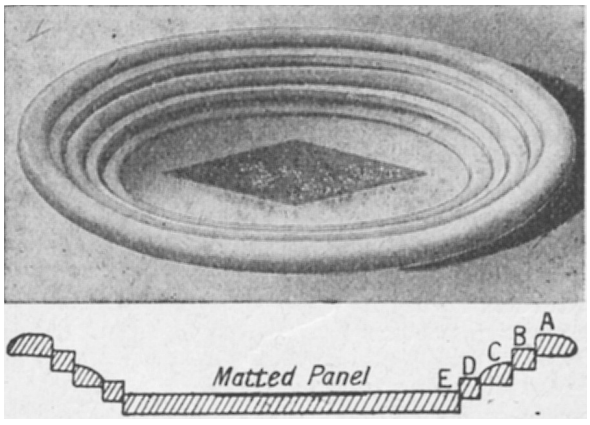


Fig. 5.

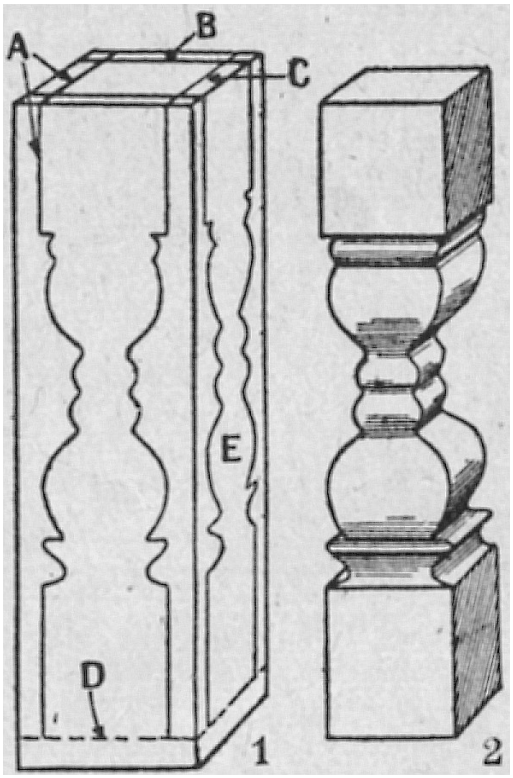
Fig. 5. Adjustable cutting table in use.



Antofret. Fig. 6. Card tray in antofret, with a sectional view showing the series of steps.

ANTO-TURNING.

This is a simple method of producing square turned columns, finials, or other similar woodwork decorations. A column such as that shown at Fig. 2, or any other pattern desired, can be produced with an ordinary fretsaw. The wood required for this work may be of any suitable size, but it must be of square section and all surfaces should be planed up smooth.



Anto-Turning, showing how a square turned column can be cut with a fretsaw.

First draw the design carefully upon a piece of good quality paper and then transfer the design to two surfaces of the wood as shown at Fig. 1. The tracing can be done by means of carbon paper and a stylus or a hard pencil. It is important to see that the features of the pattern come level with each other upon the two surfaces.

When the pattern has been placed on the wood, the latter is laid upon the fret-cutting table and the fine fretsaw blade enters the wood at the line A shown on the end of the wood. Thence it cuts along the pattern line until it reaches the dotted line D; the fretsaw should not be permitted to emerge from the wood at the other end, but should be unthreaded and withdrawn by releasing its clamp. After refixing, cut the line C on the opposite side, again cutting down the entire pattern line until it reaches the dotted line D, when again the blade is released and withdrawn from the cut.

The wood is then turned over so that the pattern on the side shown at E will be uppermost and the previous process is repeated. When the four cuts have thus been made down to the dotted line D, the surrounding waste wood is severed from the finished column by cutting through the line D squarely with a tenon saw. In the

case of terminals, the point or terminal end should come at the commencement of the cut. Anto-turnery is useful for the decoration of mantels, timepieces, cabinets, brackets, etc.

ANTWERP PIGEON. Unlike other breeds, which are subdivided according to colour, the Antwerp is classified as short - faced, medium-faced, and long-faced, according to length of skull. It is charaterised by unusual strength and pugnacity, and is one of the strongest fliers.



Antwerp Pigeon: the red chequer short-faced variety.

APARTMENTS. Considerations of letting and obligations of landlady and tenant in both apartments and lodgings are similar in nature. Information on these points will be found under Lodgings. *See* also Boarding House.

APERIENT. Under this name, and also under that of laxative, are grouped the milder purgatives, such as cascara, castor oil, sulphur, etc. Their effect is to produce one or more soft motions. Doses of common preparations of aperients in general use are:

Dry extract of cascara sagrada, 2 to 8 grains in tablets.
Liquid extract of cascara sgrada, ½ to 1 dram.
Castor oil, 1 to 8 teaspoonfuls.
Castor oil mixture, 2 to 4 tablespoonfuls.
Flowers of sulphur, 20 to 60 grains.
Confection of sulphur, 1 to 2 teaspoonfuls.
Milk of sulphur, 20 to 60 grains.
Sulphur lozenge, 1 to 2 at bed-time.
Compound liquorice powder, 1 to 2 teaspoonfuls.
Syrup of figs, one teaspoonful for children.
Liquid paraffin, 1 teaspoonful to 1 tablespoonful.
Powder of magnesia or magnesia carbonate, 5 to 30 grains, repeated doses; 30 to 60 grains as a single dose.
Liquor of magnesium citrate, 5 to 10 ounces.
Olive oil, 1 to 2 tablespoonfuls.
Tamar Indien lozenges, one.

See Constipation; EpsomSalts; Magnesia; etc.

APHIS. This is the scientific name for the family of insect pests which includes the blue fly (q.v.) and the green fly (q.v.). The plural is aphides. *See* American Blight; Apple; Plum. etc.

Apiary. *See* Beehive.

APOPLEXY. This is loss of consciousness due to sudden interruption of the normal blood circulation through the brain. The commonest cause is the bursting of a brain vessel, the walls of which have become degenerated and brittle. Conditions conducing to this disease of the blood vessels are continuous hard drinking. syphilis kidney disease, prolonged severe physical exertion, and lead poisoning. The condition is not often seen before middle life and is more common among men than women.

How so to regulate one's life as to minimise the danger of apoplexy is one of the problems of this strenuous age. The disease is without doubt commonest in people who constantly work at high pressure, who regularly eat more than is good for them (particularly meats and rich, highly-seasoned foods), who take alcohol regularly in any quantity, and who are careless about their health generally. There are certain warnings, such as dizziness on getting up from the lying down position, constant headache, numbness, or a slight loss of strength of an arm or leg.

When an attack of apoplexy occurs, the patient suddenly loses consciousness and collapses into complete helplessness. His face may be pale, but is usually flushed, and the head and eyes may be turned to one side, commonly the damaged side of the brain. The breathing is laboured and noisy.

Whenever there is the least doubt, a case of complete collapse should be treated as if it were apoplexy till its true nature be determined. Unconsciousness usually passes off in a few hours, perhaps three or four.

Treatment during an attack begins with laying the patient on his back. Loosen everything about the throat, raise the head a little.

Be sure to prevent anyone from moving him until the doctor comes. Many a life has been lost from apoplexy through over-zealous helpers carrying the victim upstairs, lifting him into bed, undressing him, etc.

Beyond placing an ice-bag on the head, there is absolutely nothing to be done until the physician's arrival.

APOTHECARIES' WEIGHT. This weight is chiefly used in the sale of drugs. It is as follows:

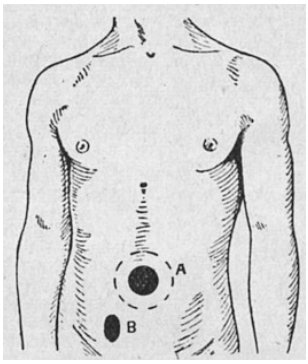
20 Grains	1 Scruple (℈)
3 Scruples	1 Dram or drachm (ʒ)
8 Drams	1 Ounce (℥)
12 Ounces	1 Pound (lb.)

The pound in this weight is somewhat lighter than the lb. avoirdupois, containing 5,760 grains against 7,000. The apothecaries' ounce, on the other hand, contains 480 grains against 437.5.

APPENDICITIS. This is an inflammatory disease of the vermiform appendix, a small blind tube of gut 3 or 4 in. long leading off from the junction of the large and small intestines. It may occur at any age,

but is commoner in young people, and especially males.

The appendix contains a large amount of adenoid tissue like the tonsil, and is sometimes called the "abdominal tonsil". It is narrow, and if there is a slight swelling of the lining at the entrance, or if the appendix is kinked, secretions may be imprisoned and decompose. Foreign bodies such as grape seeds and fruit pips are not found so frequently as was at one time supposed, but what is found quite frequently is a little piece of hardened faeces, probably resulting from chronic constipation, and this mass may even have ulcerated its way into or through the wall of the appendix.



Appendicitis. Diagram indicating where pain is first felt in early stages of the disease. A. The neighbourhood of the navel, where it begins, then quickly moving to B.

The symptoms of the disease in the first instance are pain around the navel (see diagram), nausea and sickness, a rise in temperature, perhaps between 101° and 102°, a quickened pulse, and constipation. After some hours there is tenderness at a point to the right of and below the navel, and the muscles of the abdominal wall become firm and resist any attempt to press in with the lingers. To ease the pain the patient often lies with the right leg bent up.

The patient must be in the care of the surgeon at the earliest possible moment. Many cases have got better without operation, but a deplorable number of people lose their lives because operation has been delayed till too late.

For relief of pain till the doctor comes a hot-water bottle may be laid by the side of the patient, or an ice-bag may be applied to the part, and as this should not press on the belly, it is suspended from a bed-cradle, placed under the bed-clothes, so that the bag touches but no more.

APPETISER. Besides grape-fruit, hors d'oeuvres served at the beginning of a dinner are appe-tisers. They usually contain vinegar, something extremely savoury, like anchovy or sardine, and an active condiment, such as Chili pepper. Cocktails are used as appetisers, and often contain orange bitters to give them pungency. *See* Appetite; Bitters; Cocktail.

APPETITE. When the system requires nourishment there arises automatically the natural craving for food which we call appetite. It is this and the taste of food which start the flow of the gastric juices. The appetite may be affected psychically and an ill-cooked and badly-served meal may do much to reduce it, as may any depressing emotion. To a certain extent appetite is a measure of the quantity and a guide to the nature of the food one should take; what we fancy is likely to be good for us. But there are exceptions to this, as a poor appetite may not represent the needs of the body, but may be due to faulty hygiene, such as sedentary habits, too little exercise, or the abuse of tobacco, tea, alcohol or other drugs.

Where a poor appetite is part of a disease its treatment is included in that of the particular disease. In cases where the habits are at fault the obvious thing to do is to correct such a habit. However, something may be done to improve the appetite by the use of "bitters," such as calumba, gentian, quassia, cascarilla, or a little orange peel. The following is an excellent example of an appetiser:

Compound tincture of cardamoms	1½ drams
Concentrated compound solution of sarsaparilla	1 dram
Spirit of chloroform	1½ drams
Tincture of calumba	4 drams
Water enough to make	6 ounces

Take half a small wineglassful ten minutes before dinner. *See* Diet; Digestion; Invalid Cookery.

APPLES: HOW TO GROW AND USE THEM

Practical Hints Concerning All Varieties of the Tree and its Fruit

Numerous separate entries give recipes for dishes in which apples are used. For insect pests and diseases that attack the apple see Apple Aphis; Apple Sawfly, etc.

There are nearly 2,000 varieties of dessert and cooking apples, yet new ones are still sought for and produced. A list of the best sorts for domestic use is given below.

DESSERT APPLES

ALLINGTON PIPPIN. A juicy, well-flavoured apple for eating in October, November and December. It crops surely.

BLENHEIM ORANGE. Good alike for dessert and baking, but not boiling.

COX'S ORANGE. Probably the best dessert apple.

JAMES GRIEVE. Good late autumn variety with large handsome fruit of good flavour.

LAXTON'S SUPERB. The best of the new dessert apples; of first-rate flavour; crops well; at its best from Christmas to March.

LORD LAMBOURNE. One of the best of the newer dessert apples; well-flavoured and highly coloured. In season October-December.

ORLEANS REINETTE. One of the very best winter dessert apples; of medium size; well coloured and first-rate flavour.

WORCESTER PEARMAIN. Early autumn apple. Fine colour, medium size, and good flavour. An excellent cropper.

KITCHEN APPLES

BRAMLEY'S SEEDLING. Late apple, and an excellent keeper. Useful where the soil is very heavy or damp; it has a red cheek and a tart flavour.

LORD DERBY. One of the heaviest and most regular cropping varieties. It grows well on all types of soil and bears large fruits; ready for use in November-December.

GRENADIER. One of the best early cooking apples, yellow in colour and fine in flavour. Being very prolific, it is of great use in small gardens.

EARLY VICTORIA. A remarkably prolific codlin, suitable for use in July-August.

REV. W. WILKS. A large cream-coloured apple; ready for use in October-November; drops heavily and cooks well.

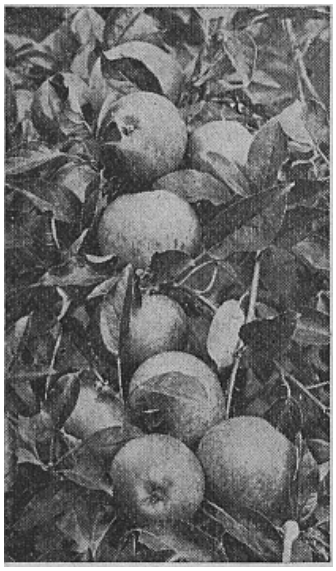
LANE'S PRINCE ALBERT. Large, striped fruit which "hangs and keeps" for half the year. Like Cellini, the very ripe fruit can be used for dessert purposes.

NEWTON WONDER. Late variety suitable for eating raw late in the season.

EDWARD VII. A splendid late variety for small gardens; in season January to April. The fruits are very large and produced freely.

STIRLING CASTLE. Large, very prolific variety; in season from Sept. to Nov. Of good flavour, it is one of the best for small gardens.

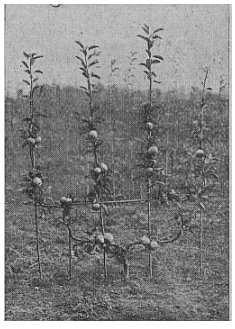
ARTHUR TURNER. An excellent new cooking apple that bears heavy crops and is fit for use at any time from July to October. It is of upright growth and suitable for small gardens.



Cox's Orange Pippin on bush tree.

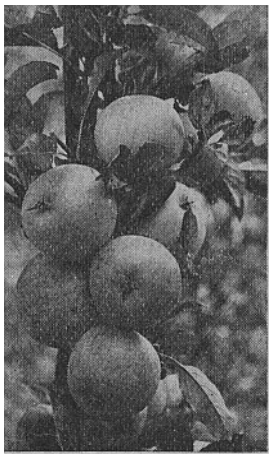
Being naturally a small tree of the hedgerows and coppices, the apple is not happy in bleak, windswept places. A southern, south-eastern, or south-western slope suits it admirably, if there is a good depth of soil. So long as the roots are kept clear, grass or vegetables may be grown between trees.

Apples thrive in most gardens, if reasonable care is taken to cultivate and feed the soil. A deep, mellow, loamy soil suits best. A light, shallow, fibreless soil on sand or gravel does not suit, but chalk is no detriment if it is four feet or more below the surface. The apple will thrive on clays and marls if well drained.



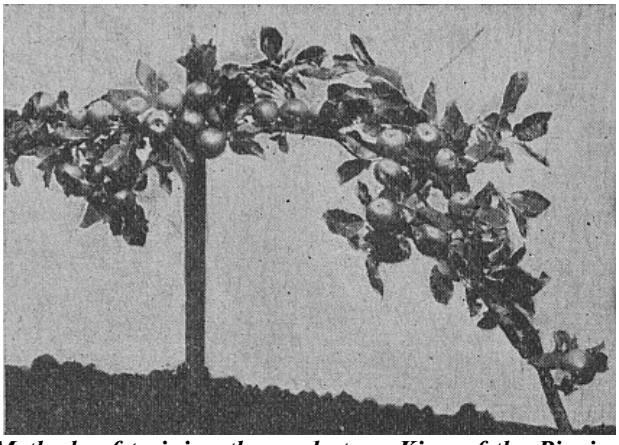
Laxton's Superb, trained grid-iron style for good fruiting.

Apples may be planted any time between autumn and spring. The best time is when the soil is moist, but not wet enough to be squelchy, and that may be from Nov. to Feb. or March. It is desirable to plant before the trees actually break into leaf. Wide but not very deep holes should be made.

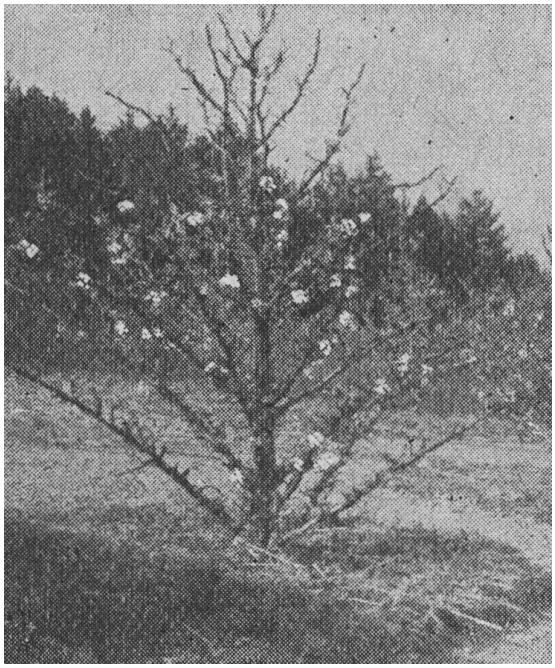


Allington Pippin, a favourite dessert apple.

Most of the manure should be put above the roots. The soil should be trodden firmly around and among the roots. Stakes for standard trees should be driven down before the trees are planted. It is a good plan to mulch trees with manure after planting.



Methods of training the apple tree. King of the Pippins apple in full fruit. This is a cordon tree which has been trained horizontally and supported on props.

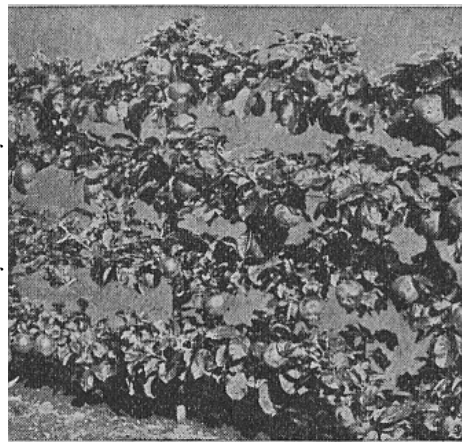


Methods of training the pyramid apple tree.

Some apples are self-sterile and if planted alone will not bear satisfactory crops. A mixed plantation of varieties alone is profitable; it is advisable to plant cooking and dessert apples near each other so that the flowers may be cross-fertilised.

Apples are best turned into good fruiting trees by shortening the heads for three successive years in decreasing degrees of severity, and subsequently summer pruning the side shoots. If the tree grows very strongly root pruning may be desirable in winter. Whether for bush or standard the maiden is shortened to about half a yard. The two-year-old tree is pruned back to about one-third, the three-year-old to about half.

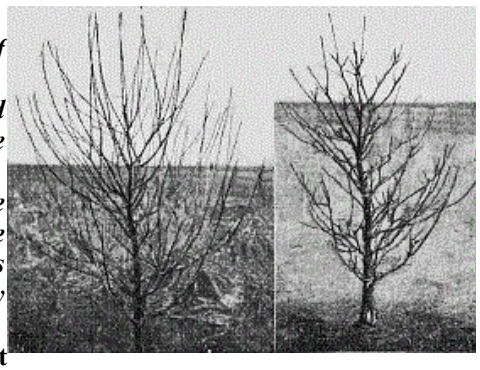
Most varieties reach the maximum of health, strength and fruitfulness with ten or a dozen strong branches a foot or half a yard apart near the base, all growing upwards and outwards, so that there is no intercrossing, and with the head of the tree cup-shaped.



Espalier trained apple tree, the best method with apples of prolific habit, proucing the maximum amount of fruit in the minimum space.

Grafting and Budding. Excellent methods of propagating apples are described by the Ministry of Agriculture in Leaflet 49, from which much of the following is taken:

Apples are grown in many forms, the most popular being standards—that is, trees with clean 6-ft. stems; half-standards, or trees with clean 3 or 4-ft. stems; bushes, that is, open-headed trees on short stems; cordons, or trees restricted to one stem, whether perpendicular or horizontal; and espaliers, or trees trained on walls, fences, or wires. These and many other forms are developed from a young tree obtained from a bud or graft, and called in its first year of growth a maiden.



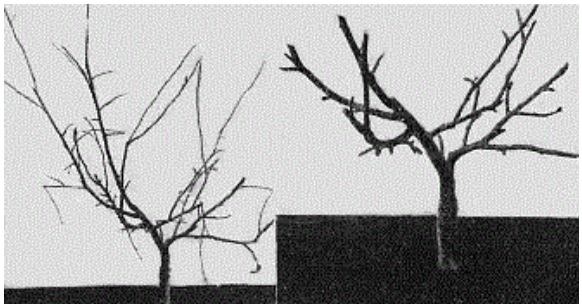
Apple: method of pruning. Left, pyramid apple tree pruning. Right, the same tree after it has been properly pruned.

The best stocks are the broad-leaved Paradise for dwarf bushes, and the Crab for the more vigorous and standard trees.

Scions for budding or grafting should be cut from prolific and healthy trees. For budding, firm wood of the current year's growth should be cut just prior to use, and kept fresh by standing in a pail containing a little water. For grafting, well-riped yearling wood should be cut in the winter prior to pruning, and after labelling with the variety, bedded in a shady position. In this way the buds will remain dormant until after the stocks have commenced growth.

Bud the stocks in July or Aug., and graft any which have failed to take in the following spring. All stocks, and particularly those which are dwarfing, should be grafted or budded as close to the ground level as possible. There is then no difficulty in planting the young trees so that the union between the graft and stock is below ground level.

The requisites for budding are a budding knife with bone handle; a pail in which to keep the scions; raffia for binding. For grafting they are pruning knife, bone or wood carving chisel to open the slits, raffia for binding, and wax or grafting clay. For top-grafting a saw is also required. Grafting wax can be bought ready prepared.



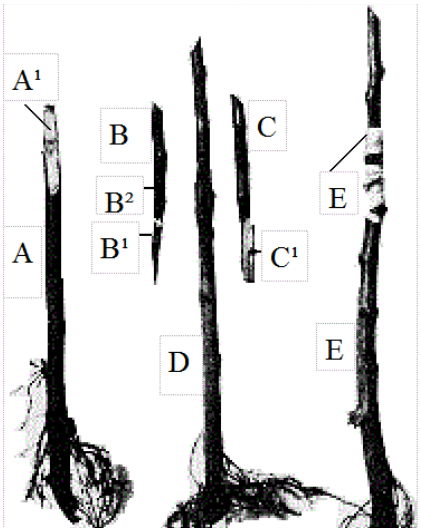
Apple: Left, a badly balanced young bush apple tree which has been wrongly pruned in earlier stages of growth. Right, the same tree after correct pruning.

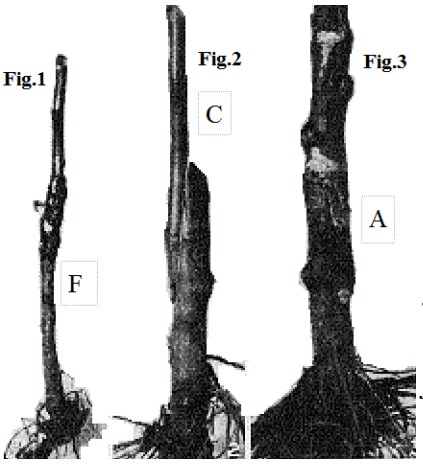
The season for grafting is during April and May, when the stocks have just commenced growth, but while the scions are still dormant. Success in grafting can only be accomplished by making clean level cuts so that the exposed surfaces of the graft and stock correspond in size and fit together tightly at least on one side.

Tongue Grafting. There are two methods: (a) When the stock and scion are of the same size (Fig. 1). First remove all the side shoots from the base of the stock. Then cut it off 2 in. or 3 in. from ground level by an upward oblique stroke 1½ to 2 in. long (Fig. 1 A) Across the middle of this cut surface, and by means of a downward stroke of the knife, a thin tongue should be carefully raised pointing upwards (Fig. 1 A[1]).

Next cut a graft containing three or four well-developed wood buds from a piece of the wood selected for the scions. The uppermost cut should be made slightly obliquely across the wood just above the top

bud. The lower cut should be about ¾ in. below the lowest bud of the graft, which is known as the stock bud (Fig. 1 B[1]). With a downward stroke of the knife make an oblique cut 1½ in. to 2 in. long across the graft on the opposite side to the stock bud, so that the exposed surface corresponds in size to that of the stock (Fig. 1 B[2]). Finally, by an upward cut across the middle of the cut surface raise a thin tongue pointing downwards (Fig. 1 C[1]).





Apple: tongue grafing. Left. Method when stock and scion are of equal size. A, stock cut to receive graft; A[1], position of tongue; B and C, grafts ready for applying to stocks; B[1], stock bud; B[2], long oblique cut surface; C[1], position of tongue; D, graft and stock fitted together; E. graft and stock bound together with raffia; E, arrow, stock-bud left uncovered; F, the operation completed; all the cut surfaces covered with grafting wax. Below. Method of fitting the tongue when stock is larger than graft (c). Fig. 3. Union of equal-sized stock and graft after one year's growth. (By permission of the Ministry of Agriculture and Fisheries.)

The graft is then applied to the stock and the two tongues fitted together tightly, so that the rinds of each coincide as far as possible (Fig. 1D) . The manner in which the tongues should fit into each other is well shown in Fig. 2. Now bind the graft and stock tightly together with raffia, leaving the stock bud free (Fig. 1 E with arrow), and cover all the cut surfaces with grafting wax (Fig. 1 F) or clay (pug) to prevent drying.

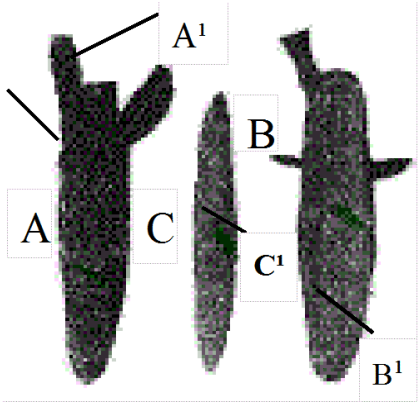
For the second method (b), when the stock is larger than the graft (Fig. 2), the graft is prepared in the same way as in (a), except that the tongue is made at the top instead of across the middle of the oblique cut surface.

The stock, after trimming, is cut almost square across 2 to 3 in. above ground level. By an upward stroke of the knife expose a clean surface on the longest side of the stock slightly wider than that cut on the graft. At the top of this surface make a tongue to receive the graft. Apply the graft to the stock so that the tongues fit together closely and the rinds coincide (Fig. 2). Complete the operation as before by binding tightly with raffia and covering all the cut surfaces with wax or clay.

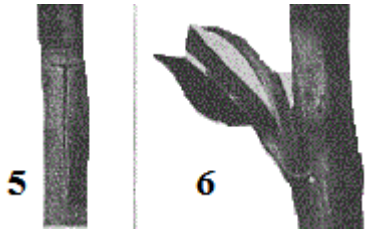
As soon as the grafts begin to grow it is a good plan to tie the main shoots to sticks to prevent the wind breaking them and to secure straight main stems. The raffia ties must be cut as soon as growth commences, otherwise the ties will cut into the wood. When the main shoots are 18 in. to 2 ft. long all the lateral growths from the grafts should be stopped. The suckers sent up from the stock should also be removed two or three times during the summer.

Shield Grafting, or Budding. The season for budding is from the end of June to the beginning of Sept. Stout well-ripened buds from the current year's growth should be used and all fruit buds or young unripened buds should be discarded. The method usually adopted is known as "shield" or "T" budding.

The bud is removed from the selected wood growth together with a semicircular shield of wood and rind, about ¾ in. in length (Fig. 4 A). To remove this shield, the cut should commence about ½ in. below the bud and finish about ¼ in. above it. The blade of the leaf is then removed, leaving the leafstalk A[1], intact for pressing the bud under the rind of the stock and preserving it from damage. Next, the portion of wood cut away with the shield is removed from the rind with the point of the knife (Fig. 4 C), but leaving the bud on the shield undamaged. Care must be taken to leave intact the small protuberance at the base of the bud, inside the rind (Fig. 4 B[1]).



Apple. Fig. 4. Preparation of the bud shield by removing core of hard wood. See text.



Below: processes in budding. Fig. 5. T-shaped cut on the stock ready for the bud. Fig. 6. Bud shield slipped beneath lips of the downward cut.

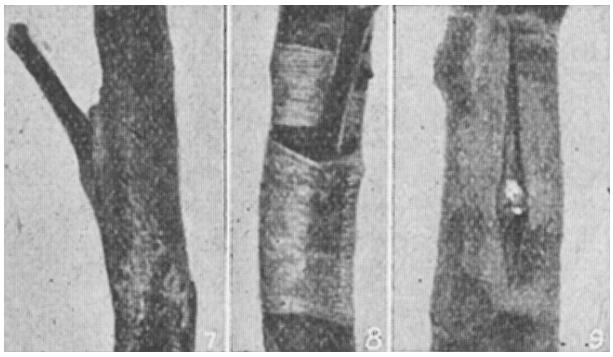


Fig. 7. Bud shield pressed completely beneath rind of stock. Fig. 8. Bud shield bound to the stock with raffia. Fig. 9. Bud united to the stock after removal of raffia. (By permission of the Ministry of Agriculture and Fisheries)

To prepare the stock, remove all suckers and side growths within 6 in. of the ground. Next make a "T" shaped cut in the rind as close to the ground level as possible (Fig. 5). The down stroke of the "T" should be about 1 in. long and the cross-cut about ½ in. The bark on both sides of the downward cut is then raised slightly with the back of the budding knife. The bud shield is slipped beneath the lips of the downward cut on the stock (Fig. 6) until the top of the shield is below the crosscut of the "T" (Fig. 7). Tie with raffia over all the cuts, but take care that the bud is left uncovered (Fig. 8).

Later in the autumn, as soon as the buds have taken, the ties of raffia should be cut to allow the stock to swell normally. Fig. 9 shows the budded stock after the raffia has been removed. Suckers or shoots arising from the stock must be removed two or three times during the summer.

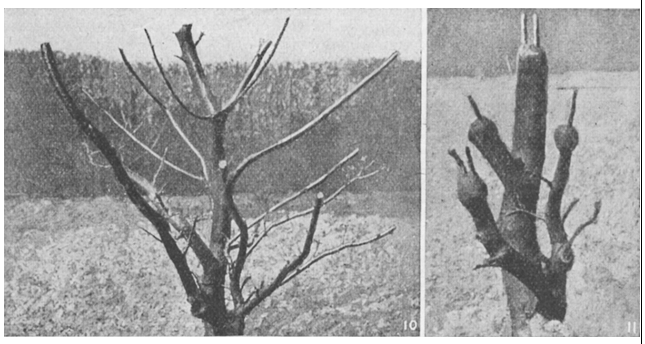


Fig. 10. Tree to be top grafted, having been cut back in the winter and with the faggot-wood removed. Fig. 11. The same tree after top grafting, showing length at which top branches of stock are left. (By permission of the Ministry of Agriculture and Fisheries)

Top Grafting. Rind or Crown Grafting is the method recommended for top grafting. The trees which are selected for this purpose should have their main branches sawn off during the winter and the faggot wood removed. Fig. 10 shows the tree cut back in this way. At grafting time— that is, when the rind peels quite easily from the wood— the branches are sawn square across (Fig. 11) where they are stout enough to support the large branches which will grow from vigorous grafts. The sawn surface at the end of each branch is then pared smooth with the pruning knife to facilitate healing (Fig. 12 A). Afterwards a longitudinal cut 2 in. to 3 in. in length is made in the bark, and the rind at the top of this cut is then raised slightly on either side (Fig. 12 A^2).

A graft (Fig. 12 B), containing 3 or 4 buds, similar to that used for tongue grafting but with no tongue, is cut and slipped beneath the raised lips of the rind on the stock. It is then pressed downwards until the long cut surface is level with the top of the branch (Fig. 12 C). The graft is then bound tightly to the stock with raffia, but the stock bud (C^1) is left uncovered. The top tie should be as tight as possible to effect a perfect union at this point and so prevent the graft from breaking when it commences to bear fruit. The operation is completed by covering the cut surfaces around the graft with wax or " Pug" (Fig. 12 D). One graft is sufficient for branches under 2 in. in diameter. Above this size two or even three grafts should be used. Fig. 11 shows the tree depicted in Fig. 10 with the top grafting completed.

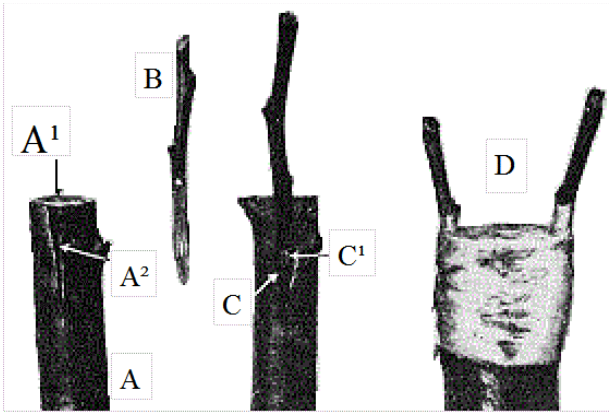


Fig. 12. Rind or crown grafting. A, branch of stock prepared to receive graft; A^1 pared surface at top of branch; A^2, longitudinal cut in rind. B. graft; C, graft slipped beneath rind of stock; C^1, stock bud. D, completion; grafts bound to the stock and cut surfaces waxed. (By permission of the Ministry of Agriculture and Fisheries)

Picking and Storing. The right time to pick apples is when the fruit parts readily from the spur on being lifted gently, but certain varieties part more easily than others. Early varieties are often intentionally picked a little earlier than late varieties, which should hang until some of the fruit has dropped naturally. If picked too soon fruit will shrivel. Fruit should be picked carefully and placed gently in the picking apron, or into a basket lined with soft material. The fruit should be handled as little as possible.

For fruit to keep well the store must be (1) Slightly moist. (2) Well ventilated; extra ventilation is required for apples during the first three weeks or so, while they are sweating. (3) Cool and of even temperature; warmth causes shrivelling, and frost generally causes decay. (4) Dark or only dimly lit; daylight spoils the quality.

Large quantities of apples may be laid in heaps, not more than 2 ft. deep, on 6 in. of clean, dry, wheat straw laid on the floor, and covered with a good thickness of straw; but this is not the best method for small quantities. Apples may also be stored in boxes, barrels, or baskets placed one upon the other in the store, so as to allow air to circulate. Special trays may be used which rest one upon another and economise space *(see* Fruit Tray).

The ripening of apples is usually well marked, the green part becoming distinctly yellow. As a rule, the later an apple ripens the longer it will keep in good condition. Early apples should keep about a fortnight after ripening, Worcester Pearmain a month, James Grieve six weeks, Cox's Orange and King Pippins two months.

How to Cook. From the health point of view, for most children and adults apples are excellent, but in some cases only agree with the digestion when cooked. For very young children raw apples should be grated into a dish just before a meal and made into sandwiches with bread and butter, or eaten with a spoon.

Apples are particularly good for casserole cookery; in this way the whole fruit is preserved, and can be served more effectively than when stewed to a pulp. Baked apples make a wholesome dish when peeled, the cores removed, and the centres filled with sugar and one clove in each. Having put them in a casserole, add a little water with some grated lemon-rind. Cover the dish and bake in the oven or stew in the hay-box until they are tender.

To stew apples, wipe eight large apples and quarter them. Stew gently with 1 teacupful of sugar, strips of lemon-peel, and ½ pint water, and serve with custard sauce or cream.

APPLE AMBER. To make this take 6 oz. breadcrumbs, 4 oz. suet, 2 oz. castor sugar, 2 eggs, 2 oz. flour, 1 lb. apples, 1 lemon, and ½ oz. fat. Chop the suet finely and mix it with the flour. Peel and core the apples and put them through a mincer, or chop them finely. Add the breadcrumbs, sugar, chopped apple, grated lemon-peel, and nutmeg to the flour and suet. Beat up the eggs and mix them well together with the other ingredients. Grease a pint mould or basin with the fat; then pour in the mixture, cover it with a greased paper, and steam it for 3½ hours, or cover it with a floured pudding-cloth and boil it for 3 hours. It should be served with sweet sauce. This is enough for six persons.

APPLE AND PEAR SCAB. Great damage is caused in orchards every year by the ravages of scab, which is one of the most widely distributed fungus diseases. The information given is taken from the Ministry of Agriculture Leaflet 245.

During early spring the part of the leaf which bears the fungus becomes a dark olive-green or sooty colour. Sometimes the fungus confines its attack almost entirely to the veins of the leaf, while in other cases it forms distinct and sharply-marked patches scattered over the surface. The early infection of the fruit takes place almost entirely from the leaves. The wind-borne spores alight on the fruit, germinate, and penetrate the skin, beneath which they form a mass of fungus tissue. In time the skin of the fruit is broken, and dark-coloured spores escape.

Affected wood is readily distinguished by its blistered appearance. It should be cut out when pruning the trees in winter. Badly diseased wood should be cut out as far as possible without injuring the trees, and this should be completed by the middle of March. To prevent the new wood being affected, it is necessary to spray during spring and summer:

There are two mixtures which may be used. Bordeaux Mixture (q.v.) and Lime-sulphur (q.v.). Bordeaux Mixture is the more effective though in the case of a few varieties of apples it is apt to cause scorching. These varieties include Beauty of Bath, Cox's Orange Pippin, Duchess's Favourite, Gladstone, James Grieve, Lady Sudeley. On all of these a lime-sulphur spray only should be used.

In bad cases of apple scab several applications are necessary, the first immediately before flowering, the second as soon as the petals fall, and a third about three weeks later. On pears the first spraying should be given directly the fruit is set, and a second spraying three weeks or a month afterwards.

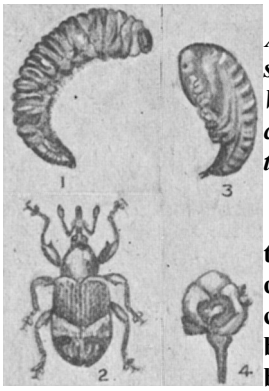
APPLE APHIS. Blue bug blight, otherwise apple aphis, is a pest of apple trees. A description of the symptoms and treatment is given in the Ministry of Agriculture Leaflet 106. The damage is mainly to the foliage and young wood, though the fruit may be stunted.

The blue bug or rosy apple aphis causes the leaves to curl up, and beneath this shelter the lice reproduce, poisoning the foliage by their secretions. They swarm on the leafstalks, shoots, and fruitlets, and by their punctures deform them. The leaves may fall and only a few stunted and galled apples remain. The green apple aphis feeds upon the young top growths.

Apple aphides can be controlled by spraying. Limewash should be sprayed early in the season when the eggs are about to hatch. The normal time to apply this wash is when the leaf-buds are swelling and about to burst. The whole tree must be covered, and especially the twigs and smaller branches. A contact insecticide, such as nicotine (q.v.) and soap, or pyridine (q.v.) and soap, may be used during the period between the opening of the leaf-buds and the bursting of the bloom. A contact insecticide such as paraffin emulsion is used from the middle to the end of October, when the leaves are falling. The aphides are then laying the winter eggs, and can be killed by a thorough application of aphis wash.

APPLE BLOSSOM WEEVIL. A small black beetle barely a third of an inch long, known as the apple blossom weevil, feeds on the leaves of the apple

tree in summer. During the spring the female weevil pierces the buds of the fruit spurs and lays one egg in each bud. The Ministry of Agriculture Leaflet 28 describes its effect on the apple tree.



Apple Blossom Weevil in various staged of life. 1. Larva. 2. Weevil. 3. Pupa. 4. Blossom bud containing weevil. In 1, 2, and 3 the insect is much enlarged.

Certain of the blossoms fail to expand, the petals having died and become brown in colour without falling off. Such blossoms are known as "capped blossom," and underneath the brown petals is a small yellowish grub (or later a pupa), which has eaten away the base of the flower. The blossoms attacked invariably die and fall off.

Weevils hibernate on the trees, and a winter wash, or later a limewash, will destroy many of them. In small orchards it is worth collecting capped blossom by hand before the beetles emerge. The weevils early in June may be trapped by bands of sacking tied round the tree. The bands should be removed and burned in the autumn. It is possible to reduce the number of the beetles by shaking them off the trees just before they lay their eggs. A large sheet is spread under the tree, and the beetles which fall down are tipped into a pail containing a little paraffin.

APPLE CHARLOTTE. Line a greased pie-dish or pudding basin with slices of bread and butter, leaving no crevices. Fill the dish with stewed and sweetened apples and add a clove, if this flavour is liked. Cover the top of the dish closely with slices of bread.

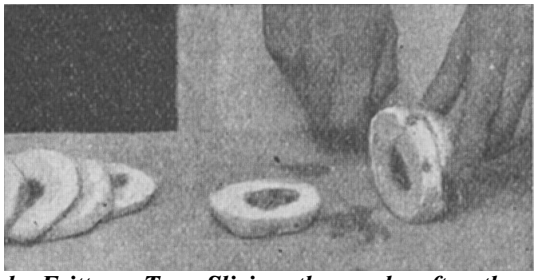
APPLE CHUTNEY. A good recipe is composed of 4 lb. sour apples, ½ lb. Demerara sugar, ½ lb. onions, ½ oz. dry chillies, ½ lb. seedless raisins, 1 oz. salt, 2 oz. ground ginger, 1 oz. mustard seed, 1 quart vinegar, ½ oz. garlic (if liked). Peel, core and slice the apples, and simmer with the sugar and vinegar in a pan. Peel and mince onions, garlic and chillies. Wash mustard seed and dry in oven. Chop raisins. Pound them in a mortar with the onions, etc., and the ginger. When the apples are soft add the other ingredients and mix well together. Bottle and cover as for pickles. The chutney improves by storing for two or three months previous to being used.

APPLE DUMPLING. The ingredients required are ½ lb. of flour, ½ tea-spoonful of baking powder, ¼ lb. of margarine, 6 apples, 6 teaspoonfuls of sugar, and 6 cloves.

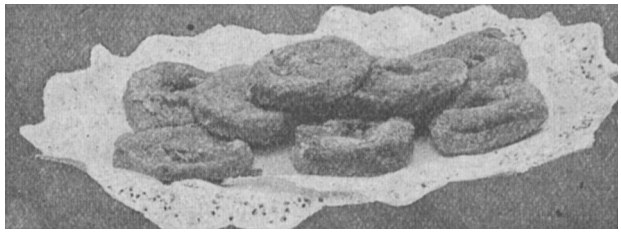
Peel the apples and take out the cores with an apple corer. To make the short crust, sift the flour and baking powder into a basin, and rub in the margarine until it is as fine as breadcrumbs. If self-raising flour is used the baking powder must be omitted. Add a pinch of salt and mix with a teacupful of water. Use a knife for this purpose, and when a ball of dough or paste is formed take this up in the hand, and use it like a sponge until all the flour is worked into a stiff paste. Mix more water as required in lightly without kneading it. Turn on to a floured board and divide into six pieces.

Roll each piece into a round shape, and place an apple on each. Put a clove and a teaspoonful of sugar into the centre hole of each apple. Damp the edges of the pastry, and draw it up round the apple to the top ; squeeze the edges together and make it look as round as possible. Press it well, and turn it down on to the sealed end. Brush it over with white of egg or milk, and bake in a hot oven about 30 minutes. Try with a skewer near the bottom to see when the apple is done. The pastry should be a light brown in colour. Sprinkle with sugar, and serve hot or cold. Sufficient for six persons.

APPLE FRITTERS. These require ½ lb. of flour, 1 lb. of apples, 2 eggs, ¾ pint of milk, and deep fat for frying. Put the flour into a basin and make a well in the centre. Break the eggs into a basin, and drop each into the flour unbeaten. Add half the milk gradually, stirring all the time, and letting the flour fall in from the sides of the basin to prevent lumps. Do not add all the milk at once, or the batter will be too thin. Work it until it is smooth, like a thick custard, and beat it well for 10 minutes. Stir in the remainder of the milk and stand on one side for an hour for the batter to thicken. A coating batter should be thick enough to cover the back of a wooden spoon as it runs off. If it is too thin, add more flour ; if too thick, gently stir in more milk.



Apple Fritters. Top. Slicing the apple after they have been cored. Bottom. The fritters as they should be served.



Peel the apples and take out the cores with an apple corer. Cut them into rings about ½ in. in thickness. Put into a deep-fat frying- pan enough dripping, lard, or salad oil to fill half the pan. Heat this until it begins to send up a faint blue smoke, dip the apple rings into the batter, and then take out and drop them into the hot fat—about four pieces at a time. Fry them a golden

brown, turning them in the fat; then drain them on kitchen paper. Bring the fat to smoking heat again and continue until sufficient apple-rings have been fried. Sprinkle with castor sugar and serve very hot. The fat can be used again and again for frying. This makes a dish for six persons.

APPLE JAM. Good flavoured cooking apples should be selected, and there should be enough to weigh 6 lb. after being peeled and cored. Peel them thinly, cut into quarters, and, after removing the cores, slice them and put into a pan with a pint and a half of water. Peel 2 lemons thinly, and tie the rind in a piece of muslin with 8 cloves, and add to the apples. Cook until the apples are a soft pulp, remove the clove-bag, and pass tho apple purée through a sieve.

Put this pulp back into the pan, add 4½ lb. of lump sugar, boil for 1 hour, skim and stir frequently. Be careful to put it into clean dry jars when it is cool. A few drops of cochineal added when the jam is boiling improve the colour. Tie the jars down closely, and keep in a very dry place. *See* Jam.

APPLE JELLY. An important requisite is to have a proper jelly bag (q.v.) ready for use.

The apples are cut up in the rough, neither peeled nor cored, though bad parts should be removed. Rinse the fruit and cover with cold water in a stew pan. Add some strips of lemon peel and boil quickly until tender.

Next pour the pulp into the jelly bag and let it drain slowly. Do not squeeze the bag, or the jelly will be cloudy, and no boiling will clear it. Measure the liquid obtained, return to the pan, and bring to the boil. Add 1 lb. of lump sugar to each pint. Remove scum and boil fast for 30 minutes. Drop a little on to a cold plate; if this forms into jelly it is ready for the jars. When set, cover the jars with air-proof papers and store in a dry place.

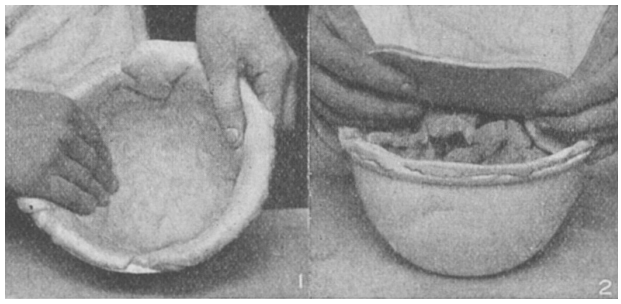
APPLE PIE. The ingredients are 1 lb. flour, 3 oz. lard, 3 oz. margarine, 1½ teaspoonfuls baking powder, 3 lb. apples, 6 oz. sugar, 1 oz. lemon rind and 3 cloves. First peel, core, and slice the apples. Put half of them into a pie-dish, in the middle of which is an inverted egg-cup, add the sugar and flavouring, and on this lay the remainder of the apple slices. Let no sugar be on top of the fruit next the pastry, as this makes it heavy. Pour in 1½ teacupfuls of water.

To make the short crust that is usually employed to cover the apples, sift the flour with the baking powder into a basin, add a good pinch of salt, and then rub in the margarine and lard; 6 oz. margarine alone can be used. It should be well rubbed in with the fingers till the whole flour is mixed with it and looks like fine breadcrumbs. Then pour in enough water to make it a dry paste. The water should not be added all at once, but gradually, though not too slowly. Mix it in with a knife, not a spoon. Turn the paste on to a well-floured board, and roll it out with short forward rolls, lifting the pin up between each roll.

The crust should be about a quarter of an inch thick. Cut a strip from the pastry. Moisten the rim of the pie-dish, and put on it the strip, cut side outward. Damp this, and cover with the pastry, pressing the edges together. Cut off the rough edges, and mark the edge with the back of a knife or fork dipped in flour. Bake in a hot oven for 30 min.

The pastry should be a light brown and the apples soft. If the pastry browns too quickly, remove the top browning shelf of the gas stove, or put on to a lower shelf in the oven, and cover with a greased paper. Sprinkle the pie with castor sugar, and serve hot or cold. If the apples are not good cookers, they should be stewed before being put in the pie-dish, and allowed to get cold before adding the crust.

APPLE PUDDING. In the first recipe given, which contains suet, the following ingredients are required: ½ lb. flour, ¼ lb. suet, 1½ lb. apples, 3 oz. Demerara sugar, 3 cloves, together with some grated lemon rind.



Apple Pudding. 1. Lining the basin with a suet crust; it should be pressed well down. 2. Fixing on the top crust to the edges of the lining pastry.

Peel, core, and slice the apples. Chop the suet finely and mix with the flour, add a pinch of salt, and mix to a stiff paste with water. Cut off one-third of the pastry for the top of the pudding. Flour the board and rolling-pin, roll out the larger piece of crust to a round shape about one and a half times the size of the top of the basin. Grease the basin and line with the pastry, working the creases evenly into the sides and pressing well up to the top of the basin. Put in half of the sliced apples, sugar, and flavouring, and fill up with the remainder of the apples, and add a teacupful of water to make a syrup.

Roll out the small piece of pastry to the size of the top of the basin, moisten the edges, and fix on to the pastry lining the basin, not round the outside rim of the basin. Cover with a greased paper, tie it on, and steam for 3½ hours. If boiling, cover with a greased paper, and then a floured pudding cloth, and boil 2½ hours. For steaming, have sufficient boiling water to come three parts of the way up the basin, and add more boiling water as it boils away. Boiled puddings must be immersed in boiling water, and be kept covered and boiling fast all the time.

To serve, loosen the edges from the sides of the basin with a knife, put a flat dish on the top of the pudding, gently and carefully turn the pudding basin over, shake it, and the pudding should leave the basin quite clear.

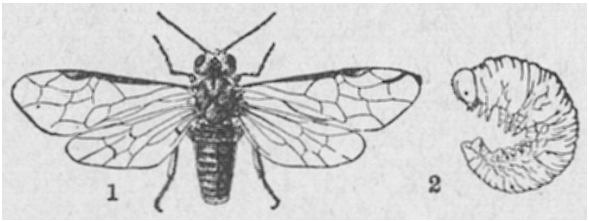
Prick with the knife to allow the syrup to run round the dish, and serve at once.

A recipe in which no suet is used can be made thus: Mix four teacupfuls of flour with an equal quantity of breadcrumbs, two teaspoonfuls of baking powder, and a good pinch of salt. Rub in 6 oz. of margarine, and then add enough cold water to make a stiff dough. Knead on floured board, and roll the pastry into a round. Line a greased bowl with it, and put in slices of apple covered with sugar. Cover it with pastry and then with greased paper. Steam for two to three hours.

APPLE ROLY POLY. Prepare the pastry as for apple pudding. Roll it out into a strip 8 or 10 in. wide and ⅓ in. thick. Spread over it apple jam, or minced raw apples and sugar, leaving 1 in. at the sides untouched by the fruit. Moisten the edges, roll it up, and put it into a greased 3-lb. stone jam jar. Cover with a greased paper, tie down, and steam for 3 hours. If it is to be boiled, tie it in a floured pudding cloth, immerse it in boiling water, and boil for 2 hours. This is enough for six persons.

APPLE SAUCE. Peel, core and slice 5 large apples. Place them in a saucepan with half a teacupful of water. Simmer and stir over a slow fire until pulped. Turn them into a basin, beat well with a fork, add 1 teaspoonful of sugar, half a teaspoonful of made mustard, a pinch of salt, and a small piece of butter. Squeeze in some lemon juice, and serve in a sauce tureen. This sauce is eaten hot with roast goose, roast duck, and roast pork.

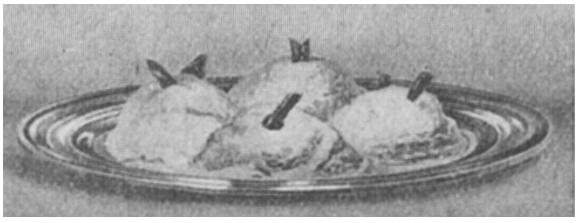
APPLE SAWFLY. The injury caused by the apple sawfly resembles that of the codlin moth, the attacked fruit seldom growing to any size and generally falling off in July. The pest is dealt with in Leaflet 13 of the Ministry of Agriculture.



Apple Sawfly. 1. Adult fly. 2. Larva of the pest. Both are shown considerably enlarged.

The measures which have been found of service are as follows, but they are suited to small gardens rather than to fruit-growing on a commercial scale. All attacked fruits should be picked off the tree and destroyed before the larvae have left them. The pupae in the soil may be destroyed by carbon bisulphide injections or by the use of some other powerful soil fumigant. By thoroughly working the soil under attacked trees some of the pupae may be exposed to the attacks of birds, while others may be prevented from emerging. A dressing of kainit is said to be beneficial.

APPLE SNOWBALLS. Peel four apples and remove the cores with an apple corer. Place them on a baking-dish, and put half a teaspoonful of sugar and a clove into the centre of each. Put a little water into the bottom of the baking-dish, and bake in a moderate oven 20 to 30 min. until tender. Beat the whites of three eggs stiffly, and whip into them 1½ dessertspoonfuls of castor sugar. Remove the apples on to a shallow dish, and cover each with the white of egg mixture. Place in a warm oven for l5 min., to set the meringue. Garnish with angelica or glacé cherries and serve cold. The snowballs can be made to look more attractive if surrounded with chopped jelly.



Apple Snowballs. Attractive way of serving baked apples, the snow being white of egg and sugar.

APPLE SUCKER. The apple sucker is a green, filmy fly about one-twelfth of an inch long. It is seen flitting about in autumn, and does double injury, as its larvae feed on the buds in spring. How to deal with this pest by spraying limewash and contact insecticide is set out in Leaflet 96 issued by the Ministry of Agriculture. The formula for limewash is 10 to 15 lb. of best quicklime in lumps to 10 gallons of water. The trees are sprayed about the time when the buds begin to swell. Shortly before the blossoms open a contact insecticide of nicotine and soap should be applied. The following formula has proved satisfactory: Nicotine (98-99 per cent.), ¾ oz.; soft soap, ½ - l lb.; water 10 gallons.



Apple Sucker. Above, larva in third stage; below, insect. Both magnified.

APPLE TART. Pastry as for apple dumplings or apple pie is made. Line a shallow tart-dish, with pastry and spread over with stewed apples. Cut strips of pastry and lay them in cross-bars over the tart. Bake in a good oven for 20 min.

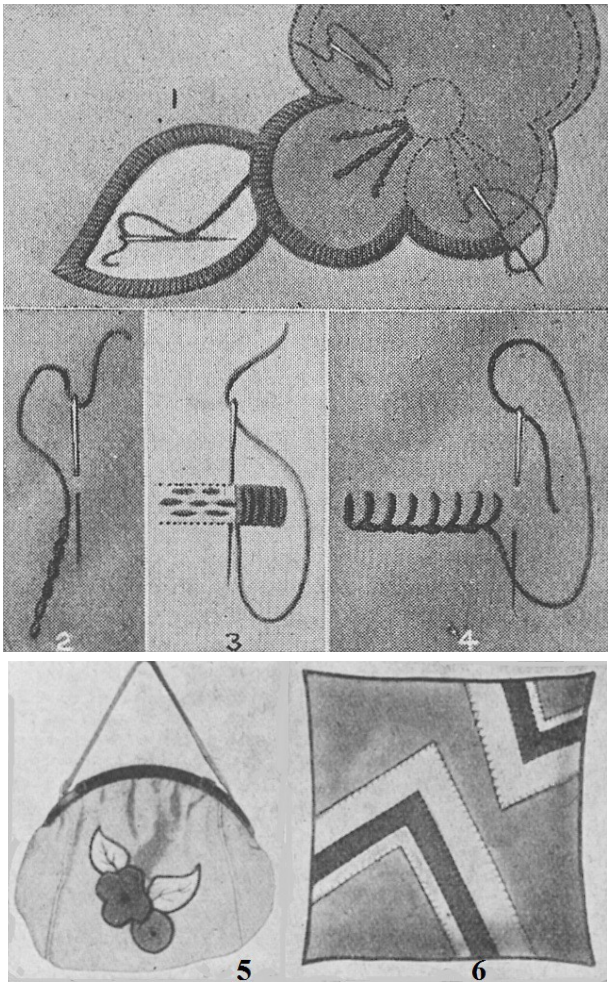
Another apple tart is made by lining a greased pastry ring with puff pastry. Bake in hot oven, scoop out the soft centre and fill with stewed and sieved apples. Whip the whites of 2 eggs to a stiff froth, and fold in lightly 1 tablespoonful of castor sugar. Put on the top of the apple to cover, and return to the oven for 5 to 10 min. to bake the meringue a light brown. Decorate with a few glacé cherries and serve cold.

APPLE TURNOVER. Make the pastry as for apple pie. Cut it into rounds, and put in each a tablespoonful of chopped apple with a sprinkling of sugar. Moisten the edges and double the pastry over.

Bake it in hot oven for 20 min.

APPLE WATER. Take 4 large cooking apples, 2 quarts of cold water, the juice of a lemon, a strip of lemon peel, and enough sugar to sweeten. Cut the apples into rough pieces and boil them until soft with the lemon peel, water and sugar. Strain off, add the lemon juice, and serve cold. This is a good drink in hot weather.

APPLIQUÉ NEEDLEWORK. This French word is used for a form of decorative trimming in which one kind of material is "applied" upon another to form a pattern. Thus lace is often appliquéd on washing satins and crêpes for blouses or underwear, and scraps of coloured silks, satins, velvets, linens or cretonnes can be utilised for making gay patterns on cushions, bags, curtains and table sets. Motifs, ready made for appliqué, can be purchased in lace and in such diverse materials as tinselled braid and brushed wool (the latter in white 'animal' shapes for applying to nursery coverlets), but more originality can be displayed by cutting out designs suitable to the work in hand.



Appliqué Needlework: Stitches used in the work. 1 and 4, buttonhole; 2. stem stitch; 3. satin stitch. 5. Bag trimmed with appliqué work. 6. Cushion decorated with geometrical patterns appliquéd with buttonhole stitch in coarse silk.

Lace, for instance, particularly lends itself to good effects when a needlerun kind is chosen with a large flower design, which can be cut out and sewn or embroidered on to the garment, smaller pieces of the lace design being used to fill out the pattern as required. Special lace motifs can be made for household linens, but a brighter note in decoration is the coloured border to white linen, wide enough to take motifs designed each from a different fruit, apple, pear, cherries, grapes, etc. These can either be drawn on the coloured linen selected, or transfers can be obtained. Flower designs can be applied in the same way if preferred. Luncheon sets and afternoon tea cloths are most successful with this appliqué, the colours of which should harmonise with the china and table decoration in use.

A simple form of appliqué is shown in the bag illustrated in Fig. 5. Such designs can be used for cushions, blotters, sachets, etc. Buttonhole stitch, Figs. 1 and 4, and satin stitch, Fig. 3, are the two simple stitches employed for appliqué, and the design should first be neatly tacked on to the article in the correct position. Where possible edges should be turned in, especially for linens which will have to be frequently laundered. Details too small for appliqué, such as stalks of flowers or tendrils of vines, can be embroidered, using stem stitch, Fig. 2.

The simpler the design the more effective the work. Conventional or geometrical patterns are particularly good for colour notes on cushions or curtains. The stitch employed for the appliqué of the angular design in coloured satins on the cushion illustrated in Fig. 6 is buttonhole stitch in coarse silk. *See* Embroidery; Lace.

APRICOT. A heavy, clay soil suits many fine plums, but the apricot requires a fertile, mellow and friable loam, with sand or chalk not far from the surface. If the soil is stiff it can be lightened and sweetened by breaking up, and adding lime rubbish and gritty matter. Do not overdo the use of yard manure, which is rich in nitrogen.



Apricot trained against a sunny wall, and protected at the top by a glass frost-shelter.

The following is a good annual dressing: if no yard manure is used, an addition of one part of sulphate of ammonia may be made: 4 parts, by weight, superphos-phates of lime; 3 parts sulphate of lime; 2 parts sulphate of potash; ½ part sulphate of iron. The mix-ture is spread round the trees at the rate of ¼ lb. per square yard. Mulching with yard manure might be practised in early spring. Every third year a

dressing of ground lime or slaked lime at the rate of 1 lb. per sq. yd. might be given.

Both for size and flavour of fruit no variety of apricot equals Moor Park, but there are other good kinds, as the following list shows:

BREDA.—Very old variety, fruit small, but of good flavour, ripe in August on a wall, but somewhat later in the open. About the best variety for growing as a standard.

HEMSKIRK.—Large fruit, ripe about mid-August, resembles Moor Park, and must have a wall.

LARGE EARLY.—Large fruit, ripe early in August.

MOOR PARK.—Large fruit, very rich in flavour. Ripe at the end of August. Liable to loss of branches by gumming.

POWELL'S LATE.—Large fruit, paler than Moor Park, ripe in September.

The apricot is trained with main fruiting branches spaced a foot or more apart over the face of the wall, diagonally, in the familiar fan shape. It is best to renew the fruiting wood every few years by taking up shoots from wood-buds at the base, and turning them into fruiters by summer pruning. Apricots are generally propagated by budding them in early summer on Mussel or St. Julien Plum stocks, the former being used for Moor Park and other choice varieties, while the latter is employed for standards.

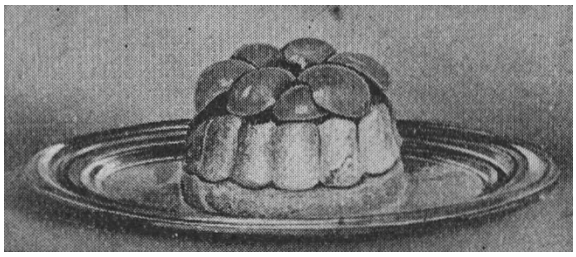
APRICOT BATTER. Take one small tin of apricots, a pinch of salt, 3 oz. of castor sugar, ½ lb. of flour, 2 yolks and 2 whites of eggs, ½ pint of milk and water, 2 oz. of dripping, and one gill of apricot syrup. Mix the flour and salt together, and put through a wire sieve. Then make a well in the centre of the flour and place in the yolks of the eggs, gradually mixing the flour into them. Gradually add the milk and water, and as it is added more flour must be mixed in. An even consistency about the thickness of custard must be maintained all the time the batter is being mixed. When well mixed, beat it until the surface is covered with bubbles.

Strain the syrup from the apricots and lightly stir one gill of this into the batter, and put aside for an hour. Cut the apricots into quarters; use only about half of them, as too many would make the batter heavy. When ready to cook the batter add the sugar and apricots and lightly fold in the whisked whites of egg. Melt the dripping in a pie-dish, and when hot pour the batter into it. Bake in a moderately hot oven for about forty-five minutes. Place carefully on to a hot dish, cut into six, and serve at once. This is sufficient for six persons.

APRICOT CREAM. Sieve enough tinned or stewed apricots to make ½ pint. Dissolve without boiling 1 oz. of gelatine in 1 gill of water, or in syrup from the apricots. Mix with 3 oz. of castor sugar and the strained juice of half a lemon, and whip ½ a pint of cream until it will nearly, but not quite, hang on the whisk. Having strained the gelatine into the fruit, mix and lightly stir in the whipped cream. Pour the mixture into a mould that has been rinsed with cold water and leave it till it is set. Dip the mould into warm water and turn the whole on to a dish. This is sufficient for 4 or 5 persons.

APRICOT EGGS. A simple sweet for children's parties is made from apricots without any cooking. Cut some plain cake into large rounds. In the centre of each place the half of an apricot to look like the yolk of an egg. Surround the yolk with a thick layer of whipped cream flattened till perfectly smooth. The result will resemble poached eggs on toast.

APRICOT GÂTEAU. Take one small tin of apricots in syrup, 2 eggs, 1 pint milk, 4 small sponge cakes, and 1 dessertspoonful of sugar, with a little vanilla flavouring and cochineal. Grease a border mould with margarine or butter. Heat the milk in a saucepan with the sugar and add it to the beaten eggs, crumble the sponge cakes and mix with the eggs and milk, and finally add vanilla for flavouring, together with a few drops of cochineal, sufficient to make the custard look deep yellow in colour.



Apricot Gâteau. Sweet made with sponge cakes, apricots and egg custard.

This mixture should be poured into the mould and covered with a greased paper, the mould being then put into a saucepan of boiling water, on an inverted saucer, the water reaching only half-way up the side of the mould. It should not boil, but simmer, otherwise the custard will curdle. Steam until it sets, which will be in from 30 to 40 minutes. When cooked, turn it carefully on to a dish, and leave until cold. The apricots should be arranged round the top of the gâteau, the cut side being placed downwards, and the apricot syrup poured all round. The custard may be baked instead of steamed. This is sufficient for 4 or 5 persons.

APRICOT JAM. The ingredients are 2 lb. dried apricots, 6 pints cold water, 6 lb. lump sugar, and 2 oz. almonds. Thoroughly wash the apricots in two or three warm waters and cut into quarters. Place in a basin, cover with the water and soak for 72 hours. Put the whole into a preserving pan with the sugar, and boil the jam for about one hour. Blanch the almonds and split them in half. Add them to the jam about ten minutes before it has finished cooking.

To make jam of apricot pulp, which can be bought ready for this purpose in large tins, take 6 lb. of fruit and 4 to 6 lb. of sugar, 6 lb. if the jam is to be kept. Boil all together until a little sets when put on a cold plate.

Mix in 2 oz. of blanched almonds when it is done.

APRICOT JELLY. Add the grated rind and strained juice of a lemon to 1½ pints of apricot pulp, or 1 large tin of apricots pulped and put through a fine sieve. Shell and shred four sweet almonds and add them. Dissolve ¾ oz. of gelatine in a gill of water, taking care that it does not boil, and strain it into the fruit, etc. Mix all thoroughly in a basin, and occasionally stir until it begins to set, then pour into a wet mould. Serve with whipped cream.

APRICOT MACAROON. Take a small tin of apricots, half a dozen macaroon biscuits, a quarter of a teaspoonful of castor sugar, a little vanilla flavouring, and one gill cream. Place the biscuits in a dish, soak them with the apricot syrup and then place an apricot on each macaroon. Add to the cream the vanilla and sugar, and then whisk it lightly until it thickens, taking care not to overwhisk it, or it will curdle; it should be poured round each macaroon and on the top of each apricot, placing a crystallised violet and angelica strip for purposes of decoration.

APRICOT PUDDING.
Sieve together 4 oz. of flour and half a teaspoonfril of bicarbonate of soda. Beat 4 oz. each of butter and Demerara sugar till the whole is as soft as whipped cream. Beat 2 eggs till frothy, then work them gradually into the creamed mixture. Stir in 2 tablespoonfuls of apricot jam and 2 tablespoonfuls of milk. Mix well and quickly, turn into a thickly greased mould or pudding basin; twist a piece of greased paper over the top and steam for 2 hours. This will be found sufficient for 6 persons.

APRICOT SAUCE. This useful sweet sauce can be made with jam or sieved pulp. Put 1 large tablespoonful of the jam or pulp into a saucepan with ½ pint of water, and then heat until it boils. Mix 1 tablespoonful of cornflour smoothly with 2 tablespoonfuls of cold water. Stir this into the boiling jam or pulp, and stir and boil gently for 5 minutes. Add 1 tablespoonful of cooking sherry or lemon juice and then strain. Sufficient for 4 persons.

APRICOT TART. An open apricot tart, served either with custard or cream, may be made by lining a greased dish with short-crust pastry, and covering this with apricots and a little of the syrup; one tin of 13 oz. will be ample for a large tart. Sprinkle the whole with castor sugar and bake in a fairly quick oven till the pastry is a light brown. This tart is sufficient for 6 to 7 persons. A closed apricot tart is made in the same way, except that enough syrup to half fill the dish is poured over the fruit, and a covering of pastry added.

APRON. Domestic servants require a stock of aprons. Plain white linen is used for nurses, for cooking and general morning wear, and fancy lawn or muslin for parlourmaids, often lace-trimmed or embroidered, for afternoon duty. These last-named aprons may be in a coffee shade if brown or green uniforms are worn. *See* Overall.

Aqua Fortis. *See* Nitric Acid.

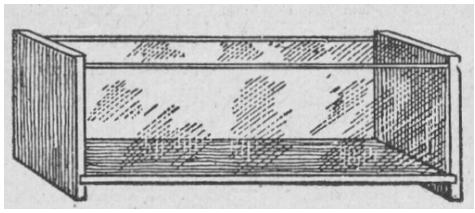
AQUARIUMS FOR THE HOME

How to Construct and Stock Them

Related articles under Fern; Gold Fish; Plumbing; Slate, etc.

The bowl of goldfish is, of course, the simplest type of aquarium, though it may not be usually thought of in that light. It is a charming, colourful thing, especially near a window, a relief piece to the rest of the furniture, and an amusing diversion for the children, but for the fish inside it, if they could make their wishes known, it is a veritable torment.

The reason is that the ordinary glass bowl in general use excludes air, it admits far too much light, and its all-round transparency is harmful to the health of the fishes.



Aquarium. Slate and plate-glass tank.

The best type of aquarium —which does not at all mean the most expensive—is that which is as near to natural conditions as possible. In a pond, for example, the light only enters from above, and there is plenty of air for its animal, or plant, life. True, one cannot in a pond study the movements and habits of its inhabitants as well as one can in the more artificially constructed, portable type of aquarium. But the principle of pond, river, or lake must be the guide, and in constructing an aquarium many advantages that nature "in the raw" frequently fails to provide, can be embodied. Unlike nature, sanctuary is not given to fish that prey on other fish. Plants can be chosen, especially those which are valuable as oxygenators, and the occupants of the aquarium can be looked after in many other ways which nature quite ruthlessly leaves to chance.

Window Tanks. Choice of site is very important. A north window will avoid too much sunlight entering to irritate the fish, or plants, or to cause harmful vegetation to flourish. If placed on the window-ledge, it will be built to suit the site. It can be made of suitable upright dimensions, if preferred, especially for inside the room, so that it will be in keeping with the rest of the furniture; Aquariums can, of course, be bought of any shape and size, and at all prices. If one is to be made to be placed outside the window, a small supply

(*Continued in page 53*)

APRIL

What to do in the Garden

Flowers

Sow in the open: Hardy annuals, e.g. alyssum; Californian poppy; calliopsis; chrysanthemum, annual; clarkia; flax or linum; godetia; lupin; nasturtium; nemophila; poppy; sweet pea; sweet sultan

Plant border chrysanthemum, viola, pentstemon, old stored dahlia roots. Layer voilet runners for fresh supply

Plant out herbaceous perennials from glass

Plant gladiolus bulbs for autumn flowering

Move seedlings from glass to cold frames

Repot azaleas, camellias, heaths, and other hard wooded plants after flowering in greenhouse

Roll and mow lawn frequently, and renovate bare patches with seed to match the turf

Fruit

Graft apples and give a spraying of Bordeaux mixture to fruit trees before blossom opens

Thin early grapes and pinch off tips of shoots, leaving one leaf above

Plant out strawberries

Look over gooseberry bushes for caterpillars

Re-pot seedling melons, and pinch off the shoots of those not required for climbing purposes

Vegetables

Plant late potatoes

Plant out lettuces and onions from frames

Put in last sowings of onions and parsnips

Sow early beetroot; carrots; salsify; scorzonera; sweet and pot-herbs; also borecole; broccoli; Brussels sprouts; cauliflowers; savoys for transplanting at midsummer; dwarf French beans towards the end of the month; and spinach, keeping on sowing at intervals of three weeks.

Food in Season

Fish

Bream; brill; dory; flounder; haddock; halibut; mullet; salmon; shad; skate; sole; turbot; trout; whitebait; whiting

Shellfish

Crab; crayfish; lobster; oyster; prawn; scallop; shrimp

Meat

Beef; lamb; mutton; pork; veal

Poultry & Game

Chicken; duckling; fowl; gosling; pigeon; guinea fowl; ortolan; ptarmigan; rabbit

Vegetables

Watercress; lettuce; tomato; radish; asparagus; broccoli; cabbage; cauliflower; early potato; seakale; spinach; rhubarb; forced French beans; Jerusalem artichoke; beetroot; carrot; mushroom

Fruit

Apple; banana; grape; grape-fruit; orange; pineapple; lemon; forced strawberries.

Notes for the Month

APL. 1.—Refreshment house licences require renewal

APL. 7.—Time limit for Fire Insurance expires

APL. 14.—Parish councils required to hold annual meeting on or within seven days

APL. 19.–Primrose Day

APL. 23.—S. George's Day

Summer Time starts at 2 a.m. on day following third Sat. in April.

of slate and plateglass will be required, obtainable from any merchant who deals in these commodities. Avoid wood, for it is too susceptible to extreme heat or cold. The most convenient shape is, of course, rectangular.

Get slate 1 in. thick and 30 in. long by 16 in. wide for the bottom, and 16 in. by 13 in. for each end. At 1 in. from the extremity of each end, that is, across the broad part, cut a groove ½ in. deep and 1¼ in. broad. First mark with an awl the exact place and dimensions of the groove, then get two straight-edged pieces of wood some inches longer than the breadth of the end; place them each side of the line which is to be cut, and nail them to the bench—they should be just wide enough apart to admit a tenon-saw—and with the saw cut the line to the required depth, ½ in.

Having sawn to the required depth, take an old chisel and a mallet, and cut out the slate which lies between the lines.

Before chiselling, be careful to put some heavy material between the slate and the bench, to prevent cracking. The grooves receive the ends of the bottom. Strike the chisel against the edge, and not on the top, to split the slate cleanly.

Now along both sides of the bottom, and across the narrow part of each end, cut, at a distance of ¾ in. from the edge, grooves ½ in. deep and ⅜ in. broad. These grooves receive the plate-glass sides, which should be ¼ in. thick. After this bore four holes, ¼ in. in diameter, right through each end. Two of these to be 1½ in. from the edge and ¼ in. below the groove which is to receive the end of the bottom, and two 1 in. from the top and just within the grooves cut for the glass.

The holes are for bolts to run across from end to end to hold the sides together. Bore them with an ordinary brace and a bit used for metal. Brass bolts are best. Before putting the ends, plate-glass, and bolts into position and screwing the nuts home, place a little cement in all the grooves, and press the glass gently downward to force it firmly into place. Carefully finish filling up the grooves with cement, and the aquarium is ready.

The cement can be red and white lead mixed into a stiff paste; or one pint each of plaster of Paris, litharge, and fine white sand, and one-third pint of finely powdered resin; or Portland cement; or, finally, four parts pitch and one part gutta-percha, applied when warm.

A strong stand under the tank will be required for support, and if the window is an upper one, the tank must be secured by iron brackets let into the wall.

The frame, back, and sides must be glazed with tinted cathedral glass. The near side only should be clear glass.

Aeration Methods. In an aerated tank a greater variety of species of fish, etc., can be supported than in a still one, and various electrical appliances are available. But simpler methods are quite practicable; either fix up a regular supply of water to drip into the tank from above, from a canister, say, regularly refilled —or run a pipe to the right spot— and provide for the overflow to drain away. In most cases, however, the movements of the fish and the oxygenating powers of the plants will provide sufficient aeration; many varieties of life thrive in perfectly still water.

To furnish the tank, get a supply of small shingle to make a flooring of about 3 inches deep and, over this, place a 2-inch layer of sand. Silver sand is best for enabling dirt or discarded food to be detected and removed, and the shingle offers a secure anchorage for plants. You may fix up a little retreat for the fishes by placing a small piece of rock over two stones a few inches apart.

In filling the tank do not use water from the main, especially in chalky districts. Take water from a stream or pond, or rain water. Let it settle for a day or two before filling.

Choosing Aquatic Plants. An enormous variety of plants is sold by the aquarium dealer, or nurseryman. Choose plants for their value as oxygenators. The so-called Eel Grass, Vallisneria spiralis, is one such, and a most graceful plant into the bargain. Vallisneria has long ribbon-like leaves, and coils like spirals. The allied eel grass, Sagittaria nattans, with its broader leaves, also gives off a large amount of oxygen. Myriophyllum, the Milfoil, a feathery plant of many varieties, is worth getting for fish that spawn on plants. The water thyme, Elodea, grows very rapidly, is a splendid oxygenator, and is not spoiled if nibbled by fish or water-snails. There are also the fanwort Cabomba, and the swamp plant, Ludwigia palustris, the water moss Fontinalis, which grows in floating platforms, and many others.

In planting, use small pots filled with heavy loam and a little clay, and conceal them under the sand or gravel before filling with water.

Stocking with Fish. Give the plants a few weeks in which to become thoroughly acclimatised before introducing the more active inmates. Under-stocking is better than overstocking. Let the guiding principle be “an inch of fish to a gallon of water,” and don’t put in any “ fighters.”

Small carp, goldfish, golden orfe, tench, rudd and bitterling are “still-water” fish that thrive well together.

Rather avoid putting in pond snails. They damage the plants and devour fish eggs.

As to food, the most nourishing for most fish is small earthworms or raw meat, finely minced, and heart or liver. If you have any duckweed plants in your aquarium, you will find that they are a favourite food with carp and goldfish, which also accept spaghetti and macaroni. For small fishes the gnat larvae, and water fleas, Daphnia, are plentiful in all ponds during the summer months. Daphnia, in bulk, are especially good in another way, for they clear the water of those minute pests called algae which darken the water, and turn it green, and often obscure the glass.

Fish Ailments. The chief of these is fish fungus

(Saprolegnia), a white film or scum on the fins and sides of the fish. In its early stages this highly contagious disease may be cured by introducing a salt solution—one tablespoonful of salt to a gallon of water.

If any fish rolls or moves about the surface of the water with difficulty, its swim bladder is probably affected. In that case, segregate it in a shallow pan of water, kept at a temperature slightly above the normal.

Parasites are the bane of many fish. Salt and pepper disease (Ichthyophthirius), caused by a minute protozoan parasite, results in an outbreak of white specks on the sides and gill covers. For this not uncommon and very contagious disease the best remedy is 5 drops of a 2 per cent. solution of mercurochrome to a gallon of water. Place the fish in this healing solution every day for a week for at least four hours at a time.

Among other enemies and intruders are beetles and water scorpions. The larvae of the beetle, Dytiscus, will attack fish several inches in length. The fish-louse, Argulus, is less easily detected. Other foes are the leech, and the fresh-water anemone, Hydra, which latter also robs the fish of their food. Suspect the presence of parasites when a fish rubs itself impatiently against rock or the floor bottom, and relieve it at once. Experience will show how to detect and deal with these pests.

Some Golden Rules. (1) If a plant becomes uprooted, it can be put back into position with the aid of a long flat piece of wood about half an inch by 12 inches in length, having a little cleft cut at one end.

(2) Remove and trim plants by tying two sticks to a pair of scissors, one to each handle.

(3) If more sand or gravel is needed, do not empty the tank—it is disturbing to the inmates and causes changes of temperature. The new sand or gravel can be poured into the tank by means of a long tube.

(4) Keep the glass clean by means of a wash- leather, rubber, or small brush mounted on a long handle.

(5) Never introduce tap water in bulk. The sudden change of temperature may give rise to that dreaded fungus disease, Saprolegnia. When introducing new fish, see that the temperatures of the aquarium and of the travelling water are the same. A cold-water aquarium should not be lower than 45° F. in winter, or above 65° F. in summer.

(6) Remove any fish that is ailing, and so avoid infection of its tank-mates.

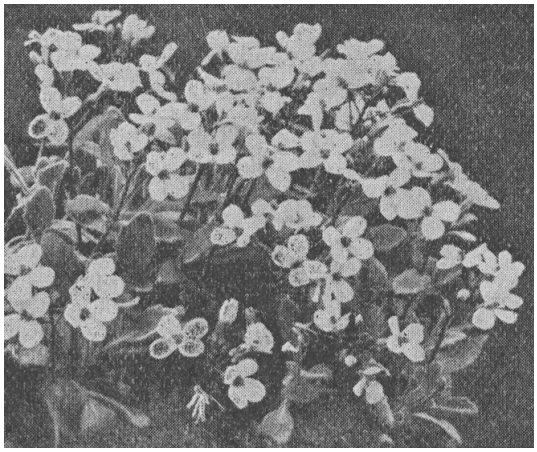
(7) Remove any stale food, or dregs, with a small pair of pincers, treated as in (2) above.

(8) Remove creeping algae with a brush, or stand the aquarium for a few days in complete darkness.

(9) Always keep a close watch for parasites. For the success of your home-aquarium, a clean tank is the first and final necessity.

If in doubt refer to an aquarium dealer, a nurseryman, or the keeper of a public aquarium. They are usually ready to help. *(See also page 55)*

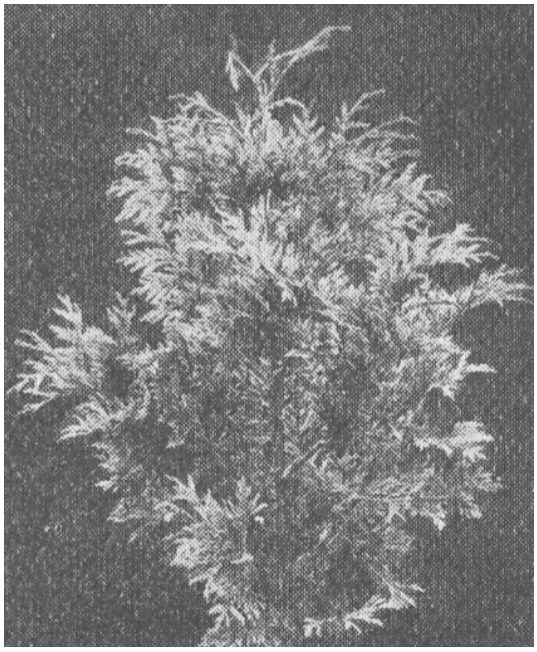
ARABIS. Hardy perennial of low-spreading habit, suiting either spring beds or the rockery, and thriving in almost any soil. The two chief species are the Caucasian albida and the Swiss alpina; both have white flowers and are at their best in early spring. They can be raised from seed sown in late spring, the seedlings being transplanted in autumn. The double Arabis albida produces large spikes of pure white double flowers. Lucida variegata has light green leaves edged with yellow. Arabis Billardierii bears pink blooms. Pron. Arrer-bis.



Arabis. Profusely flowering clump of this low-growing rock plant.

(See also page 55)

ARBOR VITAE. Two kinds of Arbor Vitae are commonly grown—the Chinese, Thuya orientalis, and the Western or American, Thuya occidentalis. They belong to the conifers, and are well adapted for small gardens, where they may be used in shrubberies, on lawns, and even as hedges.

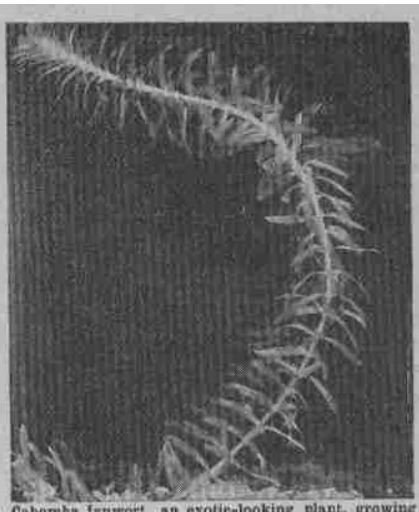


Arbor Vitae. Spray of a golden-leafed variety.

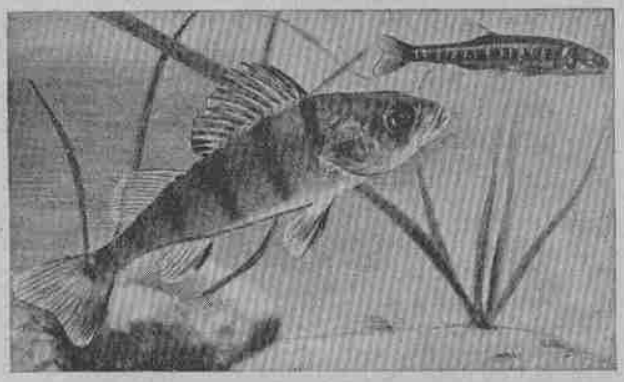
(Continued in page 56)







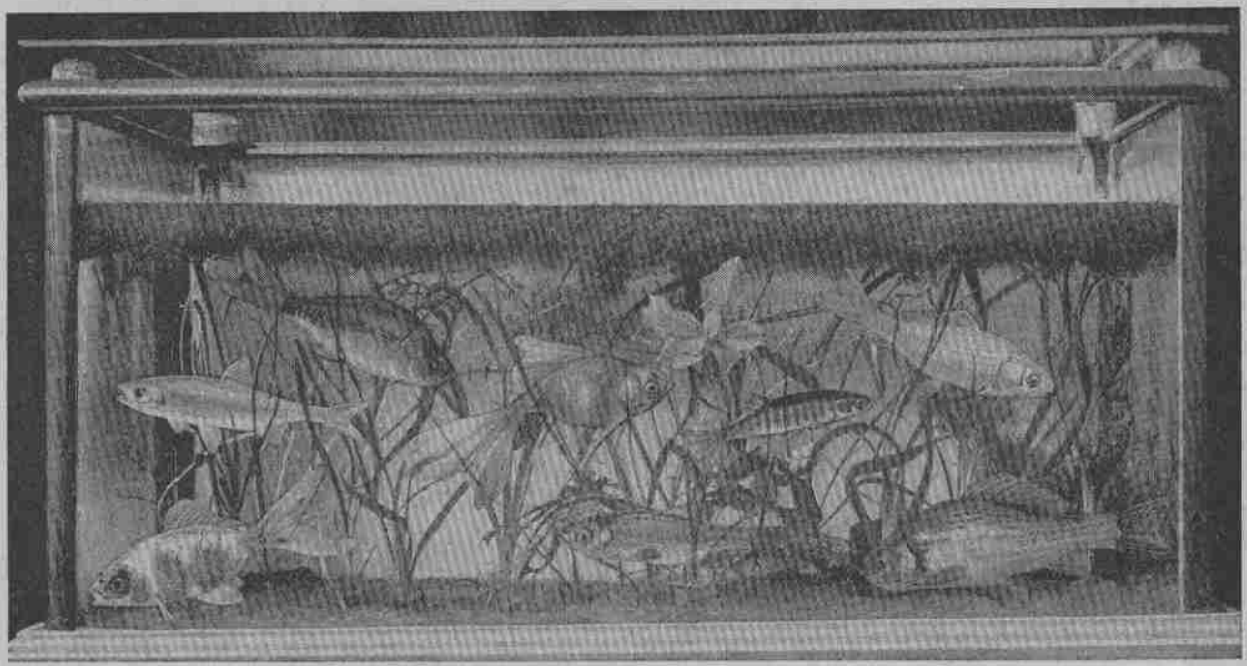
Left, Vallisneria spiralis, easily recognised for its ribbon-like, spiral coils. A splendid oxygenator. Centre, Cabomba fanwort, an exotic-looking plant, growing in successive clusters up each stem. Right, Elodea Densa, or water thyme, a graceful and vigorous plant, plentiful in most ponds





Left, a Perch chasing a Minnow. Above, the Common Sunfish. These fish are voracious cannibals fit only for their own company

Photos, A. E. Hodge



COLD-WATER FISH AND PLANTS : SUITABLE FOR A HOME AQUARIUM

This picture will give the reader a good idea of an aquarium in running order, but it has to be remembered that though the fish are represented relatively to scale, the actual size of the tank would have to be much bigger. The three fish on the left (top to bottom) are a Mirror Carp, Golden Orfe, and a scaleless Shubunkin Goldfish. Centre, a young scaleless Fringetail Goldfish above a Golden Rudd. Right (top to bottom), a Common Goldfish, a Minnow, and a Prussian Carp. The plants are Vallisneria and Sagittaria, Ludwigea, Elodea, etc.

From a painting by Felix Gardon, based on material supplied by Mr. A. E. Hodge, Editor of "The Aquarist and Pondkeeper"

The American Arbor Vitae has many varieties, including Ellwangeriana. The most popular of the other forms is dolabrata, with drooping branches, and leaves silvery beneath. There is a dwarf form, nana. Gigantea is of pyramidal habit.

All these thrive in any good soil that is fairly substantial and moist. Light, thin, dry soils do not suit them. Planting should be done in April or September and October. Pron. Ar'-bor vi'-tee.

ARBUTUS. The principal variety of arbutus is the Unedo, or common strawberry tree, which has many lance-shaped, bright green leaves, and drooping clusters of white flowers borne in September, and followed by strawberry-like fruits. There are several varieties, such as coccinea rubra and croomei. Andrachne has smooth, oblong leaves and greenish white flowers, produced in spring. Most varieties attain a height of 6-10 feet.



Arbutus. Leaves and fruit of the common strawberry tree.

They thrive best in a sandy loam or peat, and are suitable for the shrubbery. Propagation is by seeds for species, and by layers or grafts for varieties. Planting maybe done in Feb. Pron. Ar-bew'-tus.

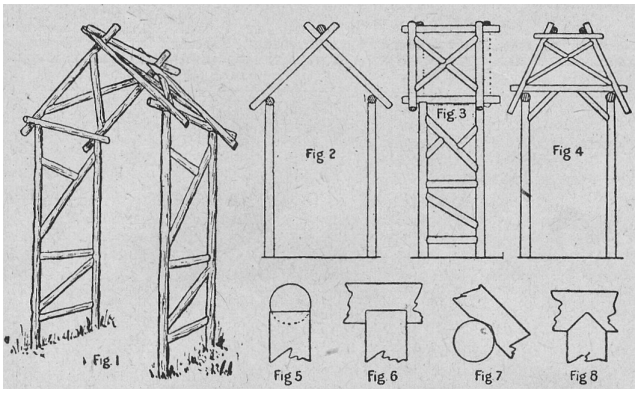
ARCHES AS A FEATURE OF THE GARDEN

Decorative Fixtures in Rustic and Plain Wood

Further information is given under Pergola; Rustic Work; Summer House, etc.

Arches for use in gardens are described as rustic when they are made of poles and branches in a natural state, with or without the bark. They are easily made if suitable material is available. Larch poles, about 3 in. in diameter, are best for uprights and framing; the smaller branches of oak, about 2 in. or so in diameter, provide good material for filling in spaces. The joints should be as simple as possible, and strongly nailed with stout wire nails. An effective design is given with the necessary joints in detail.

Timber with the bark on gives the ideal rustic appearance, but it is more difficult to make and does not last as long as timber which has had the bark removed. It is advisable in the latter case to varnish the wood in order to preserve it. That portion of the arch which is p l a c e d in the ground should be coated with or soaked in creosote, or given two or more coats of tar.



Arch. Fig. 1. Simple rustic arch made of larch wood. Figs. 2 and 3. End and side elevations of the simple arch. Fig. 4. Side view of a larger rustic arch. Figs. 5-8. Various forms of notched joints used in making arches.

Rustic Arches. An arch made from larch is shown in Fig. 1. The end elevation will be as Fig. 2, and the side elevation as Fig. 3. To build this arch, the four posts are first planted in the ground and cut off to the required level. The two horizontals are then fixed to the top of the posts, allowing them to overhang the latter some six inches. The four rafters come next. Nail them together where they cross at the top ends, and then lay in the top horizontal, and nail each of the rafters to this. The various other horizontal and diagonal pieces can next be fitted and fixed by side nailing.

Another style of arch is shown in Fig. 4, the different arrangement of the top of which gives it a more important appearance, especially when covered with climbing roses or creepers. Such an arch as this should be braced at the corners as shown.

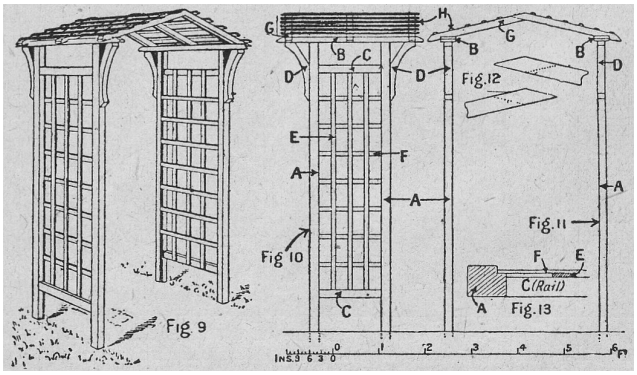
There are certain rules of construction which should be carried out. The best way to fit a horizontal piece to an upright one is shown in Figs. 5 and 6, cutting a piece out of the underside of the former so that it will fit on to the flat top of the latter; this will give firmness and strength, while no depression will be formed in which water can lie. In all cases where a horizontal piece comes to an upright, the former should be notched to fit on to the latter; but do not make the angle of the notch too acute, or there will be a risk of splitting the wood in forcing it in. This will also apply to the fitting of the diagonal pieces.

In fixing the rafters, do not cut the horizontal piece to make a flat bed for them, but cut away the underside of the rafter slightly, which will answer the purpose better; it is quite as easily done, and makes not the slightest lodging-place for water. The proper method is shown in Fig. 7.

The mitre joint shown in Fig. 8 is a very good one, provided that the timber is nearly all of one size, and that the joint is always on the underside as shown. It has, however, the drawback of weakening the horizontal piece.

Timber and Trellis Arch. A garden arch of stronger build is shown in Fig. 9. It is designed for the best timber. The wood may be oak, beech, American whitewood, or red deal. Oak will be finished by varnishing; the other woods will be well painted, a fresh coat being given each year The height must be in proportion to the width, and the width is usually determined by the path which the arch spans.

Here we assume a width of 3 ft. 6 in. over the posts. The height from the ground to top of the crossbar (B) is 6 ft. 6 in., the total height to apex of arch being 7 ft. If the arch is wider, a little more may be allowed in height, to give a pleasing proportion. The depth of arch over the posts is shown as 1 ft. 9 in. In speaking of height, it is, of course, the height above the ground that is referred to. For an arch of this size, the posts have to enter the ground from 18 in. to 24 in.



Arch. Fig. 9. Heavier type of arch constructed of quartered timber and trellis work. Fig. 10. Side elevation. Figs. 11-13. Diagrams and working scale in making the arch. See text for an explanation of the lettering.

From Fig. 9 and the section shown at Fig. 13 it will be seen that rebated posts are used. The upright laths (E) are nailed to the top and bottom rails (C), the short horizontal laths (F) lying against the upright ones and resting in the rebate. By this method the laths are not nailed over the post, and a better appearance is secured.

	Long ft.	Long in.	Wide in.	Thick in.
Four posts (A)	8	6	2¼	2
Two top bars (B)	3	2	4	1½
Four rails (C)	1	9	2	1½
Four shaped braces (D)	1	6	4½	2
Six laths (E)	5	3	1¼	⅜
Fourteen cross laths (F)	1	6	1¼	⅜
Six cross pieces (G)	2	6	2	1½
Twelve top laths (H)	3	0	1¼	⅜

The posts (A) are of 2½ in. by 2 in. material, and a length of from 8 ft. to 8 ft. 6 in. should be allowed. Framing timber 2½ in. by 2 in. may be purchased with a rebate as indicated at Fig. 13. The posts are mortised for the rails (C) to enter, and should have a tenon cut to go right through the top crossbar (B). The lower ends must be well tarred for entering the ground.

The top crossbars (B) are 4 in. wide by 1½ in. thick, lengths of 3 ft. 2 in. being required. The ends should be chamfered off as indicated, and the bars are mortised for the post tenons, which should pass right through and be wedged. They should also be mortised on the underside for short tenons on the shaped braces (D).

The section at Fig. 13 shows a rail (C) 2 in. by 1½ in. which will be tenoned (and pinned) to the post so that it is flush at the outside. The upright laths (Fig. 13) are nailed to the rails from inside. The rails (C) may be made 2 in. thick, so that they are flush with the posts on both sides. In this case they must be mortised for the upright laths to enter. The shaped braces (D) may be straight if preferred, but the shaped ones shown are an improvement. The shape may be taken from a width of about 4½ in. The thickness may be the same as the posts (2 in.) or may be reduced to 1½ in. It is well to provide a short tenon for entering the top crossbar (B), and the braces may be dowelled or simply nailed to the posts.

The laths E, F and H are 1¼ in. wide and may be ¼ in. or ⅜ in. thick. For the sake of appearance as well as for durability ⅜ in. laths are recommended. For an arch of this size, three upright laths may be fixed at each side. The horizontal ones may be spaced so as to give square openings, in which case twelve a side will be necessary, but probably the 6 in. by 3 in. openings indicated in the illustration will be preferred. For the top of the arch, allow six laths on either side. In regard to the top cross-pieces, the apex of the arch is shown as a very wide angle, this being appropriate to the type of design illustrated.

The wood for the top cross-pieces (G) may be 1 ½ in. square or 2 in. by 1½ in. (set 2 in. deep by 1½ in. wide), and to allow for the overhang and the halved centre joint, lengths of 2 ft. 6 in. should be provided. The outer ends are chamfered, and the pieces should be cut as shown to fit close down on the top bars (B). At the centre the pieces are lap-jointed (as Fig. 12) and pinned, care being taken to get all three pairs exactly alike. These top pieces are nailed to the crossbars and the laths nailed on above.

All joints should be painted before putting together, and every care taken otherwise to protect the arch from damage cause by rain. It will be found easier to fit up the two sides complete and fix these in the ground before putting on the top. The earth must be rammed down around the tarred post ends so as to avoid the risk of any sinking. A plumb-line can be used to keep the posts vertical whilst ramming, and if a couple of laths are temporarily nailed across the top the two sides can be kept in line. The upper part is easily completed after the sides are erected.

The sizes of the wood required are shown in the above list, which is given for guidance only. The lengths allow for paring, but widths and thicknesses are net.

ARCHITECTURE: THE MEDIUM-SIZE HOUSE
Professional Advice on Choice of Site and Construction of Attractive and Economic Dwellings

The information here is supplied by two well-known experts of wide experience in domestic architecture and relates to the scale plans and sketches in our colour plates, pages 63-64. For fuller details see numerous separate entries throughout the Encyclopedia, e.g. Attic, Bungalow; Cesspool; Concrete; House; Roof; Septic Tank; Water Supply; etc.

Before selecting a site, the client will do well to consult his architect as to cost and conditions of purchase, aspect, boundaries, easements, road charge liability, artificial lighting, water supply, drainage, subsoil, etc. The following points might be borne in mind:—

A good and uninterrupted view will provide an amount of restfulness and satisfaction which cannot be over-estimated.

The entrance roadway is best on the north side of the site. The best rooms can then be placed to the south and thereby enjoy the advantage of a sunny aspect and the best available distant view.

A site having a steep slope or gradient is costly to deal with, because the foundations will require to be much deeper than normal if subsequent subsidence is to be guarded against. Avoid a site containing live springs.

Chalk or stone subsoils are the best, but stone rubble, firm gravel and the like are quite good, and less costly to build upon. Rock is the best, but the most expensive to excavate. All the latter subsoils will yield good material at little cost for concrete, paths, etc. Sandy subsoils, unless free from running water and of very stiff formation, should be avoided.

Clay subsoil is generally considered to be damp, and not good for those suffering from rheumatism, asthma, and similar complaints. This is, however, frequently exaggerated. If building on clay the foundations should be not less than 3 ft. below the surface of the ground to avoid unequal settlement of the subsoil during very hot weather.

Tipped or made soil should not be built upon unless it has been standing in its present position for at least 15 years. In any case, it is advisable that the house foundations should rest upon the natural subsoil. This involves additional excavation.

How the Plans are Worked Out

The site settled, the client conveys to his architect in general terms the accommodation desired and the amount of money to be spent. The architect proceeds to scheme his plans in a manner calculated to give the best arrangement of the rooms in relation to each other. He will also give consideration to the aspect of the site, and any natural features it may possess, such as distant or near view points of interest, trees, etc. In the planning of the house he will, in addition, have clearly in mind the lay-out of the garden, so as to provide an appropriate setting for the house.

The three sets of plans in pages 63-66 illustrating this article are typical of the form in which the architect conveys to the builder what is desired, and upon which, in conjunction with the written specification, the builder bases his estimate. The first set deals with a medium sized house having four bedrooms, and the second set with a cottage dwelling of the better type, in which the general principles laid down in the first part of the article are worked out in detail.

The ground floor plan of the medium priced house has first to be considered.

The architect first roughly sketches to scale (generally ⅛ in. to 1 ft.) the entrance hall and main rooms with their fireplaces, doors, windows, etc., and then fits into their appropriate places the stairs and the various smaller apartments. In the same manner the rooms on the upper floor are dealt with.

These rough sketch plans in turn are superseded by plans worked out to scale in the more exact and careful manner shown in the illustrations. Here the front entrance porch is recessed to give shelter to visitors when waiting at the front door. The hall is so arranged that easy access is gained to the stairs, living-room, dining-room, and kitchen without an unduly long corridor. A small cupboard for hats and coats is provided under the stairs. If space and cost permit, a basin and w.c. in addition will be of great convenience.

The living-room, measuring 18 ft. by 12 ft., is planned with an outlook to the road on the north, a larger window to trap the sun on the S.W. side, and a pair of glazed doors to the S.E. giving access to the pergola and garden. The fireplace is shown in recess with a beam over the recess—denoted by dotted lines—the ceiling of which is lower by 12 in. than that of the room. The fire is of the open-hearth type with glazed tiles around the fireplace and hearth, at the side of which a small window has been placed as a peep into the garden. A picture-rail fixed to the wall, low skirting and the sparing use of enriched plaster on the ceiling, a point for electric light (or gas) in the centre of the ceiling or wall bracket, and a plug point or two for a standard lamp or vacuum cleaner should be provided. The use of pale cream paint for the woodwork, cream distemper for the walls, and broken white distemper for the ceiling will produce a satisfying architectural expression.

The Dining Room and Kitchen

The dining-room, measuring 16 ft. by 14 ft., is entered off the hall near to the kitchen in order to reduce this distance to a minimum. The fireplace has been arranged to back against the living-room fireplace, which makes for economy in cost of erection

and gives additional heat. Owing to the more occasional use of this room a gas or electric fire might be substituted for a coal fire. On each side of the fireplace cupboards are placed for china and glass. On the opposite wall an arched recess is provided for the sideboard. A large window gives an outlook over the garden to the S.E., and in addition small windows are placed in the east and west walls to trap the early and late sun. A picture-rail and low skirting, and the use of enriched plaster on the ceiling, an electric or gas fitting in the centre of the ceiling, together with paint and distemper as described for the living-room—of perhaps a darker shade appropriate to the use of the room—will make this a comfortable and pleasing room. A plug point for vacuum cleaner is desirable.

The kitchen, measuring 12 ft. by 10 ft., gains access off the end of the hall; and is lighted on the south side. This room, in conjunction with the scullery, should be very carefully planned with the object of reducing labour as far as possible. The fireplace is situated on the wall at the side of the window (opening to its full height) which will ensure its good lighting.

A cupboard for the storage of oddments and a separate store for dry goods are provided near the dresser.

The dresser is placed on the wall in close touch with the scullery, in which position it will be found to save a great many steps. It should be enclosed at the top where the china is kept. The lower portion can be arranged either with drawers or cupboards or left open with what is known as a potboard. If the potboard is not fitted to the dresser, shelves must be provided for this purpose in a convenient position. The architect, by giving careful consideration to this fitting, will save a great deal of work and labour, and produce an article of great convenience. A good modern type of cabinet might to advantage take the place of the dresser at about £7 to £12 extra cost. Rails will also be provided for the dish-covers, etc.

The floor might be made of tiles for cleanliness, or of wood blocks or ordinary boards— whichever is preferred—for comfort. The walls might be lined with tiles, or if this method is too expensive, painted or distempered. A drying line fixed to ceiling, raised and lowered with cords attached to pulleys, will be found useful in wet weather.

The larder (facing north) is entered off the scullery. Ample shelf room should be provided, including, if possible, at least one slate shelf. A ventilating brick should be fixed in the external wall near the floor and another near the ceiling. The window should have perforated wire fixed to a light frame, and be hinged on the inside to keep out the flies. The walls should be tiled or distempered, and the floor either tiled or cement finished. If space can be provided for a refrigerator so much the better.

The Scullery and its Fittings

The scullery should be in the closest touch with the kitchen, and in size about 70 to 80 square ft. It is lighted on the north side by a window about 3 ft. 3 in. off the floor. The sink should be placed near the window, and be of glazed stoneware about 8 in. deep, 16 in. wide, and 24 in. to 27 in. long, with a grooved, hardwood draining board at each side if possible. A deal plate-rack will be fixed in a convenient position on the wall over the draining board, and glazed tiles should be fixed to the wall around sink and draining boards.

The copper, if of the coal-consuming type, should be fixed near a fireplace for the easy connexion of the flue. If a gas copper is installed, a flue is not so essential. In the illustration the gas copper is shown under the draining board, which is made hinged to lift up for economy of space. The floor should be of tiles or cement, and, if cost will permit, the walls also should be tiled. As an alternative, plaster and painting, or even distempering direct to the bricks, is often resorted to. The woodwork for the whole of the kitchen quarters will be painted or stained.

Servants' w.c., coals, and trades entrance complete the ground floor. The two former apartments are conveniently planned near the scullery door, and entered off the back entrance lobby, the floors in all cases being of cement, and the walls distempered.

The ground floor is 8 ft. 6 in. high, and the staircase has 15 steps to the first floor landing.

Arranging the Upper Floor

Coming to the first floor, the stairs are of deal about 3 ft. 3 in. wide, the treads being 9½ in. or 10 in. wide, with a "rise" of about 7½ in. If an additional step can be introduced, the rise will be reduced to 7 in.

The bedrooms are entered off the landing, and are approximately alike in all particulars except size. Care must be exercised in their planning to permit of the convenient placing of the bed, dressing-table, wardrobe, etc. Cupboards convenient in size, arrangement, and position should be provided. Where practicable, a fireplace should be provided, but the type of fire to be fixed is not of such importance as in the sitting-rooms.

The floors generally will be boarded, and the walls and ceilings plastered and distempered pale tints. A picture-rail will be provided in each room about 7 ft. off the floor, and one window at least in each room should open to its full height. Where a bedroom is not provided with a fireplace, a ventilating brick should be placed in an external wall.

The bathroom should be placed as nearly as possible over the kitchen, thereby ensuring a ready supply of hot water and economy of service from the range. This room will be fitted with a porcelain enamelled bath fitted with taps of at least ¾-in. bore. The lavatory basin will be enamelled fireclay fixed on chromium brackets with chromium taps of easy cleaning pattern, and a towel-rail with hot-water circulation will be provided if cost permits. The walls should preferably be tiled or painted and the floor of deal or an impervious composition material. A ventilating brick should be fixed near the ceiling in an external wall. The w.c. should be separate from

the bathroom and fitted with a wash-down glazed stoneware pedestal w.c. with enamelled cistern as silent as practicable. A ventilating brick should be fixed in the external wall in addition to the window.

The elevations represent externally the four sides of the house as they will appear to the spectator looking directly at it when completed. It is in the elevations that the external architectural expression of the house will be imparted by the architect, who will so arrange and treat the doors, windows, chimney-stacks and roof lines that not only will they be well suited to their various practical uses, but they will be of good proportion and have a proper relation to each other.

The section is a form of elevation of the inside of the building. It is assumed to cut through the building in a vertical plane. It shows the depth of foundation, heights of the various rooms, together with certain features of construction and interior design.

The perspective sketch shows a general view of the house. The general lines of the garden are here shown, since the setting of the house will have an important bearing upon its effect.

Preparing the Specification

Before reliable competitive estimates can be obtained, the architect must prepare a specification setting out in detailed form everything needed for the erection and completion of the house.

Good stone is the best material for external walls, and sound, well-burnt bricks are next in value. If exposed to weather, bricks known as facing bricks only should be used, but frequently cheaper bricks are available locally at a much less cost and are therefore resorted to. In such cases the external surfaces are generally covered with cement roughcast in various forms to withstand the weather. Where facing bricks are used for external walls it is usual to build them in two thicknesses with a cavity between. These are generally known as “hollow” walls.

The ground floors may be of ordinary deal floor boards, pine blocks, concrete with cement mortar finish or some form of impervious composition material. Ordinary deal floor boards on joists are, as a rule, cheaper than any other form, and are less tiring to walk upon. Pine blocks laid on cement concrete might be used to advantage in the hall, and are sometimes used in the kitchen. Cement concrete floors finished with cement mortar are suitable for the floors of scullery, larder, etc. Skirtings might be of the same material.

Air bricks for ventilation should be inserted in all external walls under wood floors. A damp-proof course of asphalte or slates in cement is essential through the full thickness of the outer walls about 6 in. above the ground.

Ordinary plastering remains the best material for finishing the internal surfaces of walls and ceilings.

Deal is the timber most generally used for windows, doors, skirtings, stairs, picture rails, etc. It should be of good quality and free from sap and loose or decayed knots. Similar timber is most generally used for floor joists, rafters, plates, lintels, etc., and should be selected with equal care.

Tiles are generally preferred to slates for roofs. They need a steeper roof and are therefore rather more costly than the commonest Welsh slates; they look much warmer, however, and time improves their appearance. Thick Westmorland or Cornish slates are very beautiful in appearance, and vary considerably in shade. Their cost, however, is much in excess of ordinary tiles. Hand-made sand-faced tiles are the best. Machine-made and pressed tiles are not so durable, nor are they so beautiful. Asbestos slates are cheaper than any other form, but less beautiful. Previous to fixing tiles to the roof cover the slopes with boarding and felt; where both make the cost too high the boarding should be retained.

With regard to the decorations, where plaster is used in new work, coloured wallpapers should be avoided for a year or two, until the surfaces are thoroughly dry. Distemper is the best finish for all new plaster work, and the many shades in which it is now procurable make good decorations easy.

Exposed joinery work is usually either painted or stained. The former is generally preferred for lasting effect, but it is more costly. New work if painted should have at least four coats, and all knots in the wood should be treated with a solution known as knotting, or in due time they will deface the painted work. Enamel is more lasting than oil paint as a last coat, or two coats.

Medium Size House Plans in Colour

The house illustrated in the colour plate, page 63, should under ordinary conditions of labour and materials, and providing the site is within fairly easy reach of a railway station, say within two miles, be built for about £1,400 to £1,500, which allows for good, sound, well- designed and executed work throughout.

Another medium-sized house providing four bedrooms and a very attractive modern layout for about £1,100 is illustrated in the colour plate, page 66. The plan is for a north or east aspect, and has been contrived within a simple shape. On the ground floor, a large lounge occupies half the plan. This feature is especially called for in the modern house as a room for daily use, replacing the old-fashioned drawing-room used for “special occasions.” The hall staircase is broken up into easy flights for comfortable mounting. The kitchen is compact and designed as a room where a maid could live if necessary, although it is primarily a working kitchen for a maidless house. A particularly useful combined service or buttery-hatch and cupboard connects kitchen and dining-room. On the first floor the linen cup-board is almost directly over the kitchen boiler, ensuring quick circulation. The whole plan aims at simple design, easy domestic running, generous layout and economy.

The cost of a house can be reduced by using inferior materials, but economically this is unsound because of the increased cost of subsequent upkeep. Approximate estimates for a house are generally

prepared by means of measuring up its cubical contents. This is done as follows: Take the superficial area of the plans measuring to the outside face of the walls, then multiply the result by the height of the building measured from the top of the concrete foundations to half way up the roof. The price per foot cube for the two houses described will depend upon quality of materials specified, perhaps 1s. 2d. to 1s. 5d. per cubic ft.

What a Building Contract should Contain

To get the actual cost, the specification should be carefully compiled and invitations extended to several reliable builders to give competitive tenders. Estimates having been received and the builder decided upon, a contract is entered into between the client and builder. This contract stipulates for the completion of the house within a prescribed time, in accordance with the drawings and specification, and to the complete satisfaction of the architect. The work is thereupon commenced. During the process of building, the architect issues to the builder certificates for payments on account, in accordance with the contract, which certificates are honoured by the client. The architect, together with his client, selects the fittings required.

A well-drawn contract should contain a clause that the builder shall not be entitled to be paid for any extras unless these have been ordered in writing by the architect or by the owner. A careful architect, if he is advising a client on this matter, will always make a stipulation with the builder that the extras ordered shall be supplied at an inclusive or contract price. If he does not, the builder is entitled to charge a "reasonable" price; and the builder's idea of what is "reasonable" may differ very widely from the idea of the building owner. Out of the neglect to observe this simple precaution of stipulating for a fixed price for extras when they are ordered arise much litigation and consequent cost.

Upon completion of the house the architect certifies to the builder for the balance of the amount of the contract not previously paid to him, less about 5 per cent, of the contract price, which amount is retained on behalf of the client for a period—usually about six months—- during which time the builder is responsible for all defects arising in his work, and must rectify such defects to the architect's satisfaction before the balance is certified as due.

ARCHITECTURE: THE SMALL HOUSE

Detailed Description of the Coloured Plans in page 65.

The plans and perspective sketch given in the colour plate, page 65, illustrate a small cottage dwelling designed for a family that do not require accommodation for a maid. It may be taken as a typical dwelling for any self-contained family.

The design being governed by strict economy without undue cramping, every foot of space is thrown into the rooms, instead of being wasted on passages and staircase. The main considerations were that both living-room and parlour should look on to the high road, and that the living-room and scullery should also get the morning sun. The bathroom is placed downstairs, and the bath can be filled directly from the copper adjacent, and hot water obtained without the expense of any circulating system.

The larder, facing north, opens from the scullery, near the sink and back door, whilst outside, under cover, are the closet and coal house. The staircase rises between two walls, both for economy and to obviate dirt-collecting balusters, etc. Upstairs there are three bedrooms, each with large hanging closet, and on the miniature landing, below the window, is a long cupboard with shelves. The walls are 11 in. hollow—i.e. two half-brick walls with a cavity between, and whitewashed outside.

The problems which meet the designer here are different from those in a larger building, but certainly no less difficult. He is in most cases bound by the strict limits of economy, and in planning must always bear in mind the need for economy of housework. At the same time many good examples, both new and old, show that charm is the result of care and skill rather than money.

As regards the site, this will probably be a compromise between one's own desires and what actually can be obtained. The presence or otherwise of such services as water, gas, electric light, and drainage will greatly affect the price of the land, and, inversely, of the building. The question of sewage disposal will depend upon the nature and extent of the land, probably by a cesspool or septic system.

Considering internal accommodation and the disposition of rooms, the question of the preparation of food and the elimination of useless walking to and fro will be the main factors. The arrangement shown here —that of a small parlour, separate from the other rooms, with one large living-room with range and dresser—is probably the most generally suitable. The adjacent scullery in this case becomes the working centre of the house, and it may be used for cooking if required. A small gas-cooker may be provided if gas is available. Sink, larder, hot water, fuel, and copper are all concentrated here. If the bath is placed downstairs it must be in a separate room instead of in the scullery, otherwise all the ordinary work of the house must be interrupted every time a bath is taken.

The position of the larder is of importance, it should be near the back door, readily accessible to sink and range, and away from the heat of any flue. A north aspect is best.

The position of bath, sink, w.c.'s, etc., will mean a simple drainage scheme or the contrary. If these, in planning, can be arranged along one side or round one angle of the house, much piping will be saved. If the outside w.c. and fuel store can be approached under cover, especially the latter, it will be appreciated in bad weather.

In designing bedrooms, not only the position of beds should be considered in relation to doors and windows while in the plan stage, but also the possibility of

getting a dressing-table in a good light before a window.

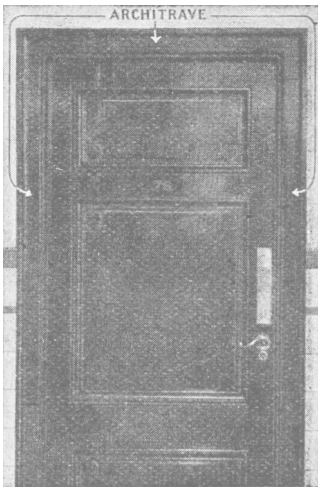
Much room is often wasted by placing a house in the middle of the frontage. If it is on a high road, and the light and other services run along this, it must not be forgotten that the farther it is placed back, to avoid dust and noise, the greater the cost of connexions. Externally, the charm of the small building will be found to consist in simplicity and good proportion; to attempt absolute balance is usually unhappy in result.

Brick still remains the most generally satisfactory material for walling. If cost precludes good surface bricks, or the building is in a district, such as many parts of the Midlands, devoid of good brick earth, a good effect may be obtained by slightly raking out the joints and covering with two coats of limewhite and Russian tallow, or one of the many substitutes now on the market. If the situation is at all exposed, it is advisable to build the walls hollow, that is, two 4½ in. brick walls with an air space between, bonded together by galvanised ties.

Roofs may be of tiles, slates, straw, or reed thatch. This last makes an excellent and warm roof with a life of 70 years or more. Straw thatch is cheaper and looks neater at first, but has a shorter life and is liable to fire.

As to windows, whether these are of steel or wood, the main consideration is their proportion and placing. In considering the interior, light and simplicity should be aimed at. Plastering, for instance, if done with a wooden float and left with a granular face, presents a delightful surface without the addition of paper or distemper of any kind. In all simple building, and especially in the cottage, the three essentials are good materials, good plan, and good proportion. The first two will give a sound and economical building, while the third will add an unconscious charm to the home.

ARCHITRAVE. The moulding employed for fixing around doorways, windows, etc., is known to the builders as the architrave. It is made in a variety of patterns, and in sizes 2 in. by ¾ in., 2½ in. by ¾ in., 3 in. by 1 in., 3½ in. by 1 in. *See* Door.



Architrave of a room doorway.

AREA. The area of a house is the sunken space before the basement found in the older class of town houses. The basement is approached from the area, to which a flight of steps leads from the street. It is im-portant to see that the area steps are in good repair, while a watch should be kept upon the fittings of the gate that guards it. *See* Basement.

ARECA NUT. This is the seed of the betel tree and resembles the nutmeg, but is harder and red in colour. The powdered nut is used as a remedy for tapeworms in dogs, the correct amount being estimated as two grains for every pound of the dog's weight. It is not advisable to give the powder to puppies under six months. Areca nut powder loses its strength on keeping. The quantity to be administered to the dog is best mixed into a paste with a little butter. The remedy is not safe for cats. Pron. A-ree'-ker or Arry-ker.

ARM: Fractures and Care. Extending from the shoulder to the hand, the arm is described as the upper arm above the elbow and the forearm below. The former has one bone, the humerus, and the latter two, the radius and the ulna.

Fracture in any of these situations will be marked by pain, perhaps a sense of snapping, deformity, and loss of power in the limb. First-aid treatment consists in pulling on the lower fragment of the bone and the application of padded splints. These are applied on the outer and inner sides of the upper arm for fracture of the humerus and when one or both bones of the forearm is broken, this is bent to a right angle at the elbow, in a position midway between pronation and supination (that is, with the thumb looking upwards), and the splints are applied on the front and back of the limb, reaching from the elbow to beyond the wrist. In fractures of the upper arm a lesser arm-sling is used, that is to say, the weight is taken on the wrist only, but for fractures below the elbow a greater arm-sling is put on, thus supporting the whole forearm.

Beauty Culture for the Arms

For improving the colour, texture and shape a simple night treatment is as follows:

Rest one hand, palm downwards, on the edge of the bath and with a loofah or rubber friction glove on the other hand, stroke firmly in one sweep from fingers to shoulder, returning down the arm with a light touch. Repeat the movement several times, apply to under side of arm and then treat the other in the same way. Sponge with warm water and while wet spread over the skin enough toilet almond meal, first mixed to a stiff paste with extract of witch hazel, to cover hands and arms. Leave on till quite dry, then brush off and gently massage the arms with this cream:

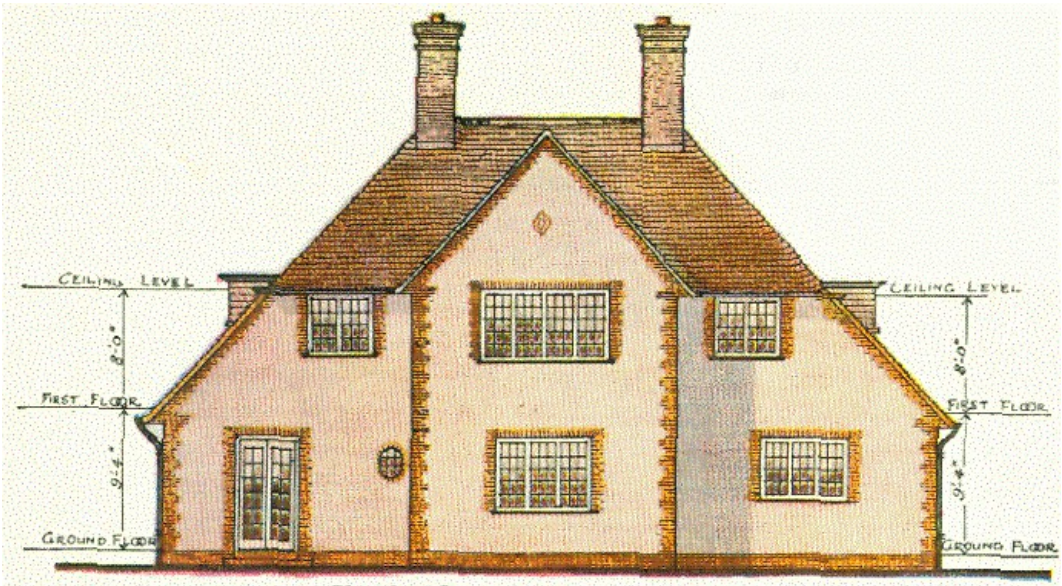
Coconut oil, castor oil, sweet almond oil, each 2 oz.; hydrous lanolin and white vaseline, each 3 oz. Melt together the coconut oil, lanolin, and white vaseline in a jar placed in hot water, stir in the castor and almond oils, perfume, and allow the mixture to cool.

Should the arms be sore from exposure the cream only can be used without friction or massage for a few nights, smearing on thickly and leaving to soak in, covered by a pair of old long white gloves, with finger-tops cut off. Ugly elbows can be improved by mas-saging with the palm of the hand each time an emollient is used for arms or face.

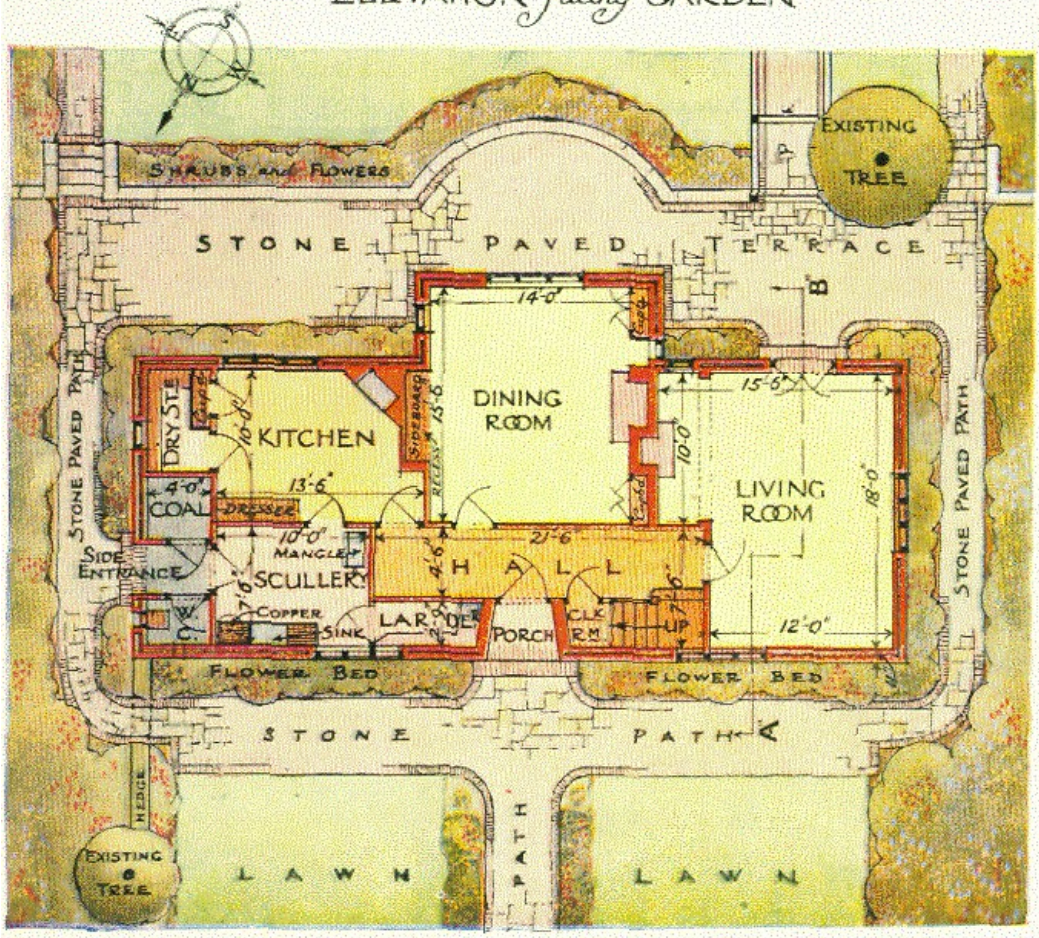
(Continued in page 68)

ARCHITECTURE OF THE HOUSE

This set of working drawings is to scale. The flans show the arrangement of the house by floors, the Elevations the external appearance of the completed house, and the Section gives room heights and foundation and roof details. Perspective Sketch in page 65.
Specially prepared for this work by Herbert A. Welch, F.R.I.B.A.

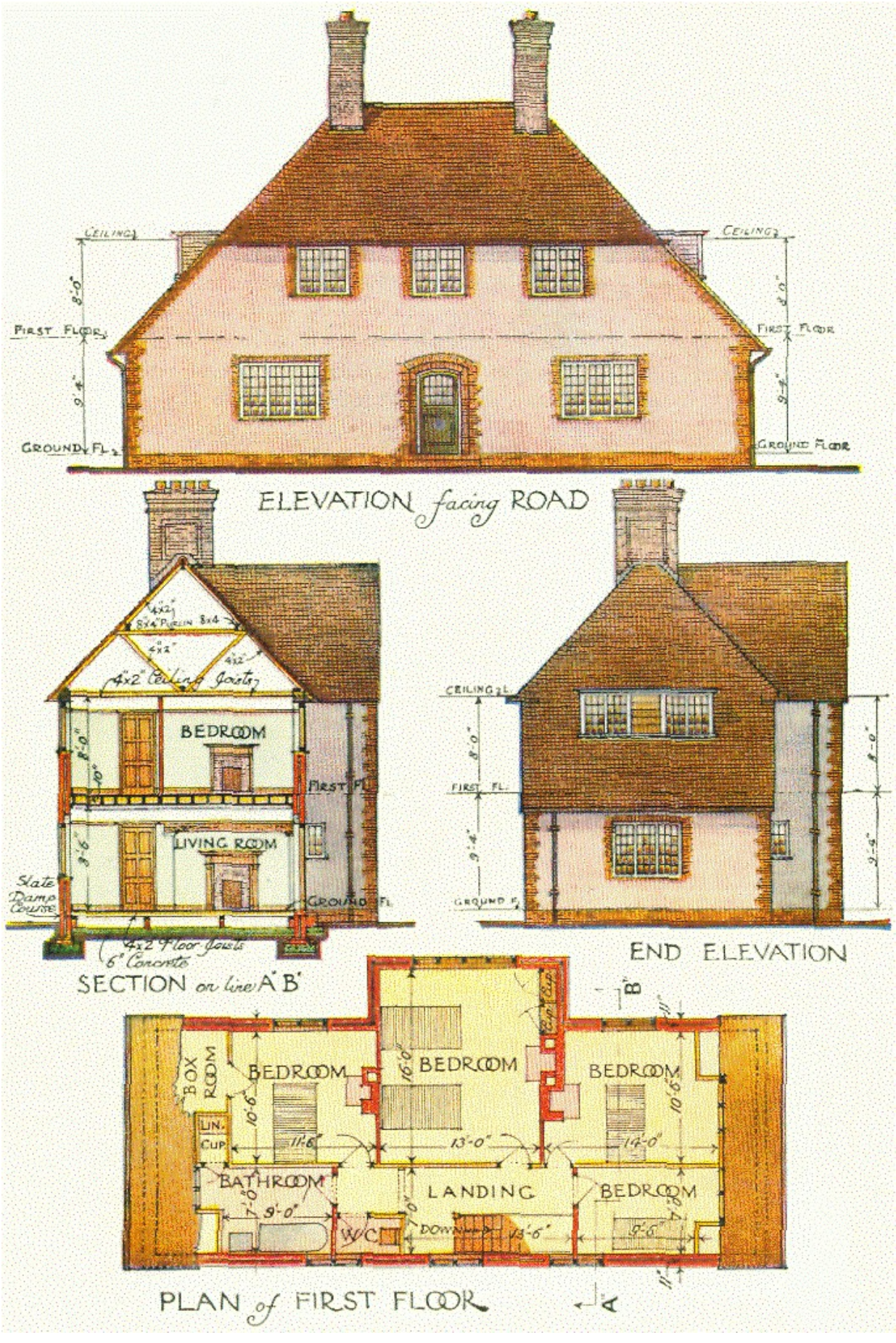


ELEVATION *facing* GARDEN



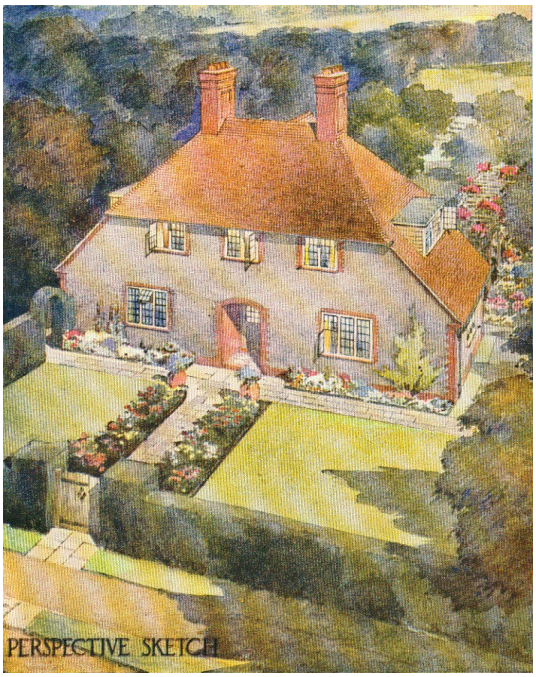
SCALE *of* FEET PLAN *of* GROUND FLOOR

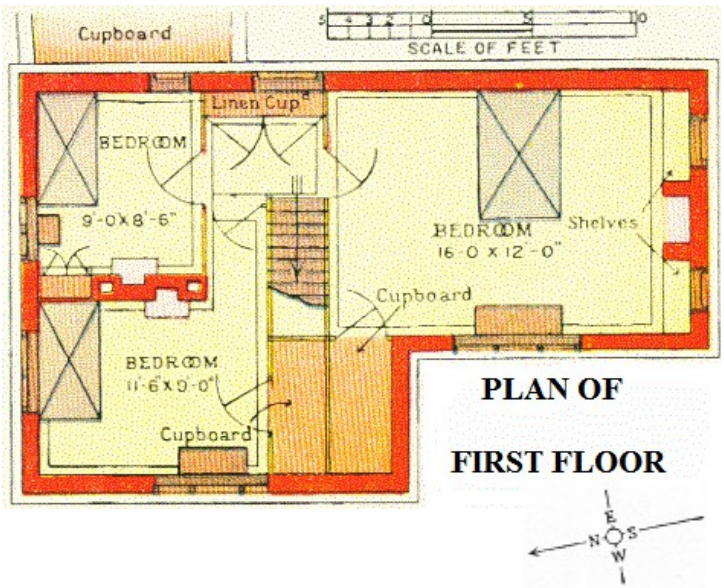
10 5 0 10 20 30 40 FEET

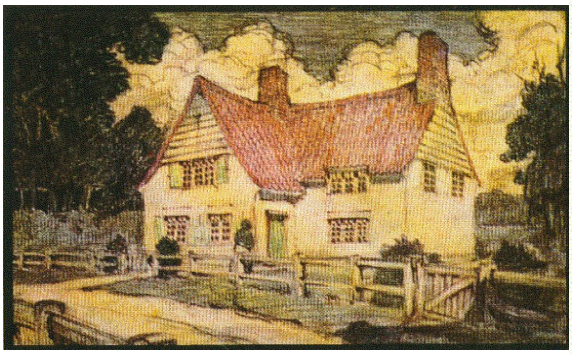

CEILING
FIRST FLOOR
GROUND FL.
ELEVATION facing ROAD
BEDROOM
LIVING ROOM
SECTION on line A B
END ELEVATION
BOX ROOM
BEDROOM
BEDROOM
BEDROOM
BATHROOM
LANDING
W/C
PLAN of FIRST FLOOR

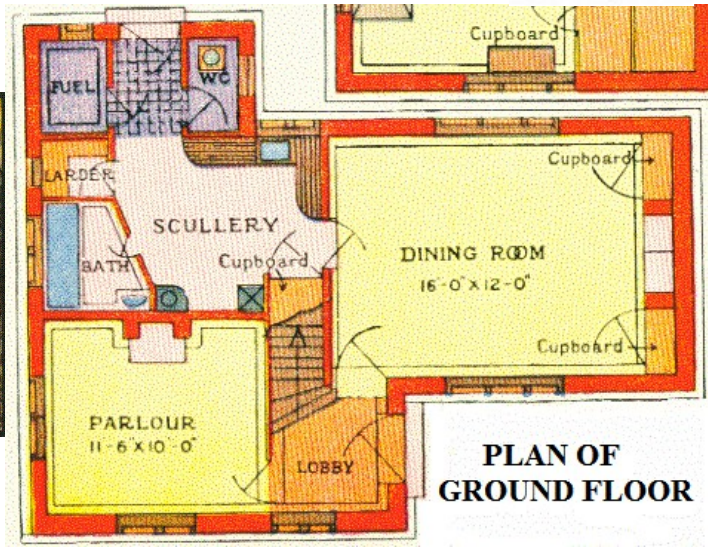
ARCHITECTURE: AN ATTRACTIVE SMALL HOUSE

Specially prepared for this work by P.D. Hepworth, F.R.I.B.A.





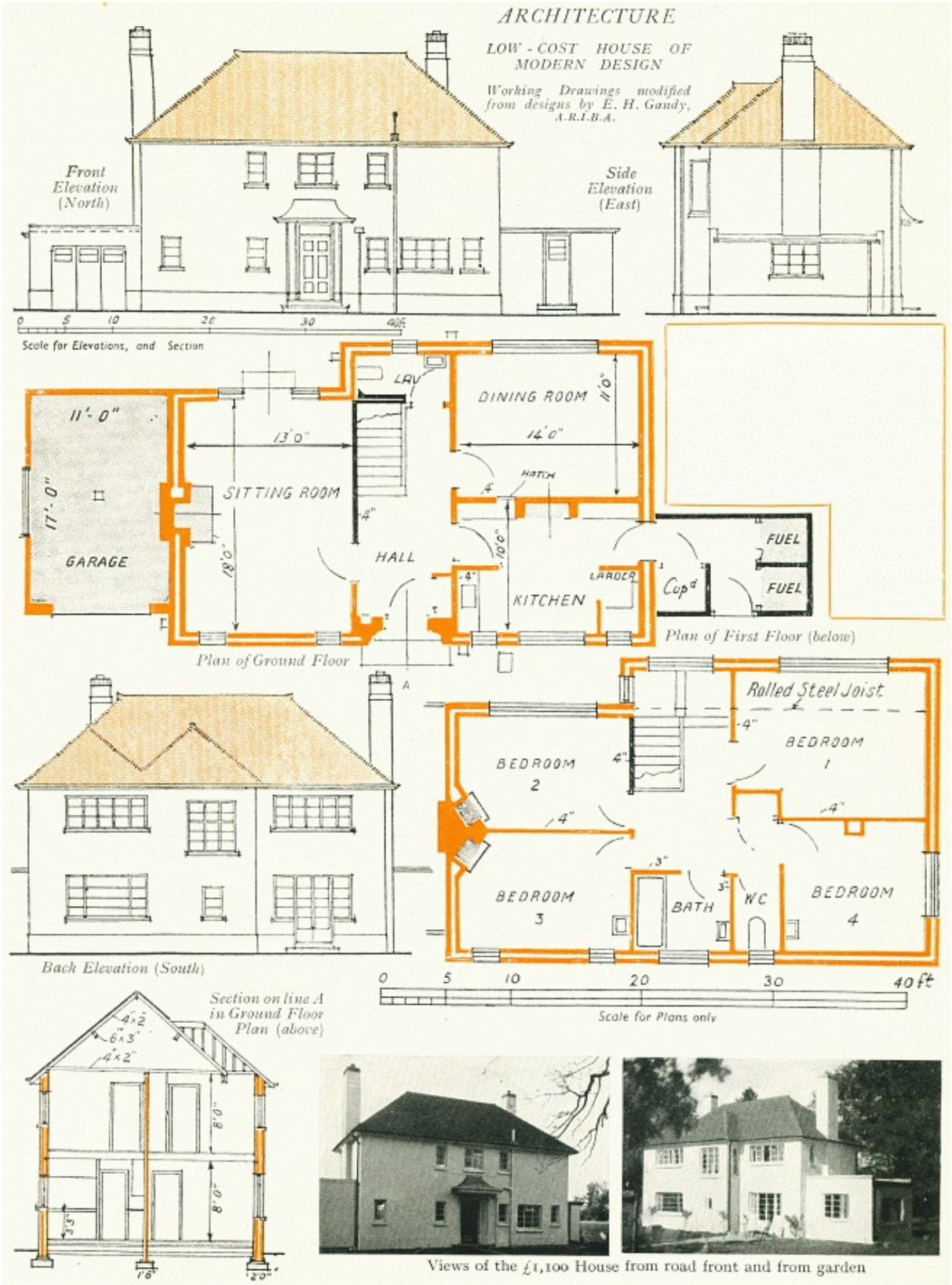




The Plans and Perspective View above show the style and arrangement of an attractive six-roomed house suitable for two or three persons or for a small family where no resident maid is kept. For descriptive details see pages 61 and 62.

ARCHITECTURE: THE MEDIUM SIZE HOUSE WHEN FINISHED

Top left, Perspective Sketch accompanies the series of working drawings for the medium size house designed by Mr. Herbert A. Welch, of which Plans, Elevations, and Section appear in pages 63 and 64. The complete set, together with the contract and specifications (see pages 58 and 61), provide the builder with the main details required for the construction of the house. Plans of another medium-size house are given in page 66.



Views of the £1,100 House from road front and from garden

MEDIUM-SIZE £1,100 HOUSE

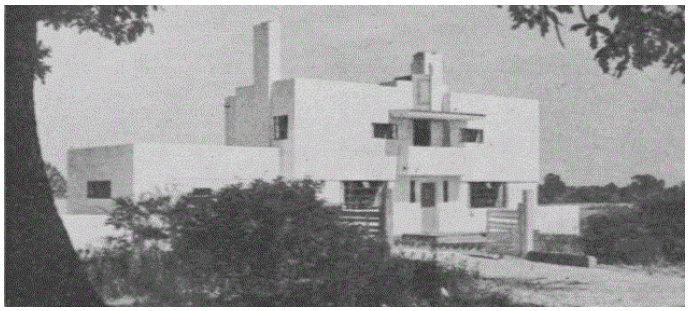
This exceptionally good example of a straightforward and thoroughly modern design is built in brick, cement-rendered and painted cream. It gives four bedrooms, a large sitting-room and excellent working kitchen at the low cost of about 1s. 2d. per cube *(see* p. 36). The elevations, plans, and photographs of the house as built differ slightly, bedrooms 2 and 3 being made one large room and an extra room being built on the garage site.

ARCHITECTURE: MODERN SMALL and MEDIUM HOUSES





In the photographs above two examples of the smallest types are seen. Left, a five-roomed cottage in lime-washed brick and weather boarding; cost about £350. Right, a cement-rendered brick bungalow at Wembley of modern design with five rooms; cost about £750. (*Dalgliesh & Pullen and Montague Elliot, Ltd*.)



Left, an excellent specimen of the modern concrete house with four bedrooms, large living and dining rooms, garage, etc. Cost about £1,900.
(Architect Sir John Burnet, Tait & Lorne)



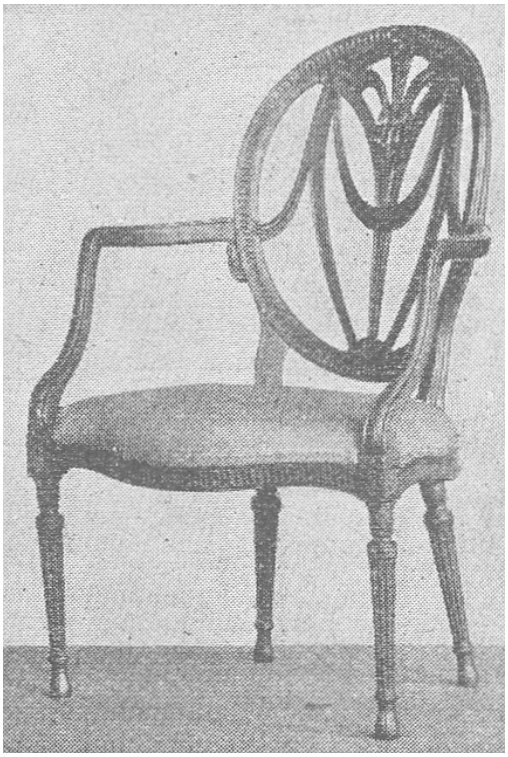


Right, medium size house in Surrey with four bedrooms, lounge hall, dining room, lounge, etc. Note Mansard tiled roof and deep eaves. Cost about £1,600-£1,650.
Left, an example in brick and cement rendering from a London building estate, the cost being about £1,095. The long metal-frame curved windows are pleasantly modern in design, and give well-lighted rooms.
(1. G.Alan Fortescue, F.R.I.B.A.; 2. Allen Fairhead & Sons, Ltd., builders)

A safety razor for the armpit is more sensible than the use of depilatories (hair removers), which sometimes cause irritation. *See* Bandage; Beauty Culture; Dislocation; First Aid; Sprain; Strain.

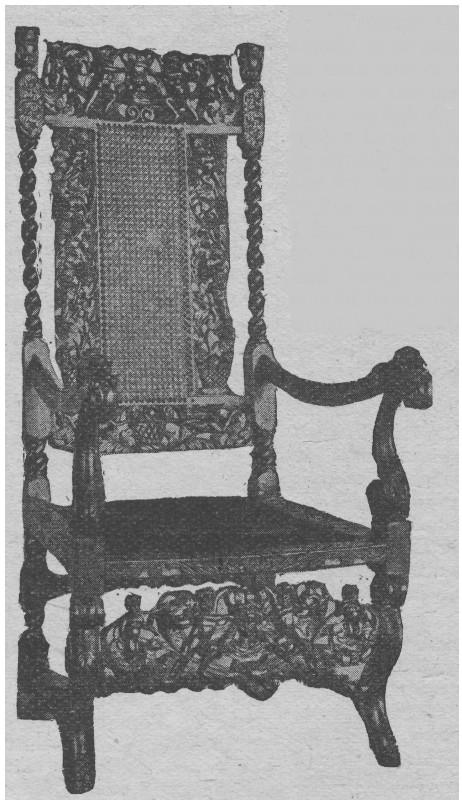
ARMCHAIRS: HOW TO CHOOSE & HOW TO MAKE
Antiques for the Connoisseur and New Chairs for Home and Garden
Other varieties are described under such headings as Cane; Chair; Garden Chair; Rustic Work, etc.

The first English armchairs were of solid wood and box-seated. Often the backs were adjustable as tables and the wood oak. Many Tudor chairs were carved, had leather seats and low backs, legs and stretchers turned. Jacobean chairs were mostly high straight-backed, with scrolled carving extending on the arms well beyond the supports. Late Stuart chairs were luxuriously upholstered and walnut was used instead of oak, as the former wood can be more finely carved. Cane panelled backs were introduced within the framework of carved wood. Upholstery was kept within the back framework, but often carried over the sides and finished with fringe or a braid. Arms were not padded.



Armchair by Hepplewhite in walnut, with shaped back and Prince of Wales's feathers splat. (Victoria & Albert Museum)

With the Queen Anne period came the fully upholstered winged armchair, needleworked or tapestry-covered, with cabriole legs and delicate stretchers, both turned and carved. In the great designer Chippendale's work a French influence is apparent, which continued throughout the Georgian periods of Hepplewhite, Sheraton and Adam, introducing more refinement, well balanced frames and beautiful decoration and upholstery.



Armchair. Carved walnut chair said to have belonged to Nell Gwynne, Charles II period. (Victoria & Albert Museum)

Modern chairmakers either base their work on these classical designs or break away completely with the lounge and divan types fully upholstered, springs being used in seats and backs and also sometimes in arms.

For garden, bungalow and bedroom armchairs, fine examples in canework are also made, while designs are also carried out with metal framework and proofed fabric upholstery.

Many modern armchairs are upholstered all over. Some have merely an upholstered seat, or seat and back, or perhaps have padded arms as well. Others are bare wood. The cheapest variety are of wicker. Another kind, costing a little more, is of cane wound over a slender wood framework. After these come the comparatively heavy and substantially built chairs of the cabinetmaker.

The wood used may be oak, mahogany, birch, walnut, or beech. In a cheap class of chair, deal may be employed for parts that are covered by upholstery. A covering of morocco leather is the most expensive, but it is durable and retains its colour, while roan leather is inferior. Most of the imitation leathers are very good; they consist of linen or duck coated with a composition. Other coverings are velvet, tapestry, cretonne, and linen. Tapestries may be wool, silk, or mercerised.

Best quality curled horsehair is used for the more expensive chairs, being more springy than any other kind of stuffing. Vegetable fibre resembles hair, and

is often employed in combination with it. Flock of various kinds and qualities is used, alone or with wood fibre or wood wool, or a dried seaweed called Alva. Canvas coverings vary in quality. Springs are used in the seat of an armchair, sometimes in the back, and occasionally for the arms, other parts being padded only.



Armchair. Modern easy chair, upholstered in printed tapestry, with unstained oak frame, shelf for workbox, ashtray, etc., newspaper rack, and adjustable back.

Adjustable Armchairs. The armchair shown in Fig. 1 has a movable seat and back, with separate cushions, and can be made by the amateur woodworker. The four legs should be prepared to 2 in. x 2 in., cut off to 2 ft. ½ in., with the lower ends trimmed off to 1¼ in. square. The fails are 1 ft. 11 in. long, with tenons cut off ¼ in. on one side only and left 1½ in. long.

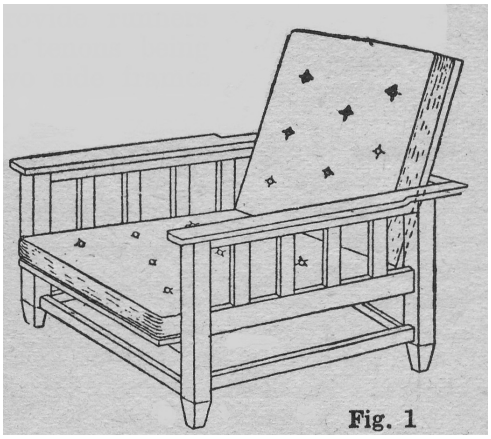


Fig. 1

Fig. 2 shows details of construction. The top rail is 2 in. wide and 1 in. thick, and mortised in ½ in. down from the leg tops so as to leave a space of ½ in. each side of the rail. The middle rail is 3 in. wide and 1 in. thick and is mortised in 10 in. below. The bottom rail, 1⅜ in. wide and 1 in. thick, is mortised in 2½ in. below the middle rail. The mortises should be so gauged that a space of ½ in. is left on each side of a rail with the flat side of the tenon on the inside, as shown in the diagram. Four uprights, each 11 in. x 2 in. x 1 in., with a tenon ½ in. long and ½ in. thick, should be equally spaced out and mortised in between the top and middle rails.

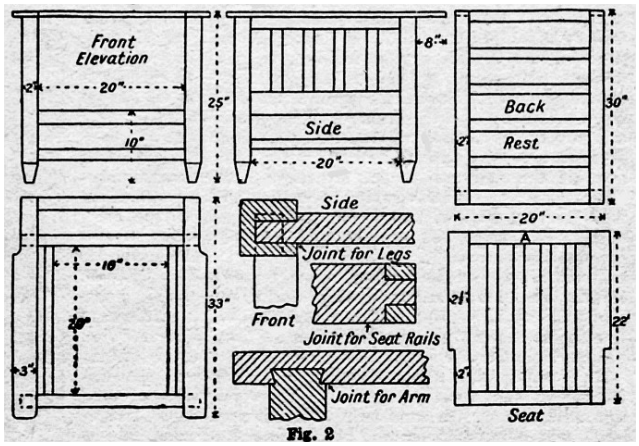
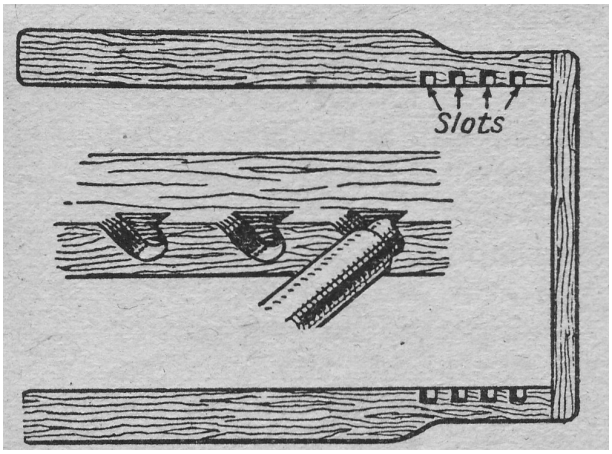


Fig. 2

Armchair. Fig. 1. Adjustable armchair with movable seat and back. Fig. 2. Working drawings giving measurements and details of joints employed.

The arm-pieces are 2 ft. 9 in. x 3 in. x 1 in., with about 12 in. at the end cut back to 2 in. wide, the top corners and the front end being carefully rounded. A dovetail should be cut on the top of the legs to hold the arms, as indicated in the diagram. The two side frames are joined at the front with two rails and at the back with three; two being seat rails, two bottom rails and one joining the arm-pieces.



Armchair. Fig. 3. How slots to hold supporting rod may be cut in arms.

The seat rails are 1 ft. 11 in. x 2 in. x 1½ in., with tenons 1½ in. x 1 in., with the cut on one side only, and they should be mortised in 10 in. from the bottom of the legs so that the notch is on the inside of the tenon and the front is set back ½ in. The bottom rails are 1 ft. 11 in. x 1⅜ in. x 1 in., with tenons l½ in. x ¾ in., and should be mortised in 3 in. below the seat rails and spaced centrally. The arm rail is 1 ft. 11 in. x 2⅛ in. x 1 in., with tenons 1⅜ in. wide and ⅜ in. thick and so sawn that one edge of the tenon is flush with the outside. The mortise in the arm-pieces should be set back ¾ in. to

bring the back rail flush with the ends.

Two rails, each 2 in. x 1 in. and 2 ft. long, should be tenoned into the seat rails and run from front to back 1 in. away from the legs. These lengths provide runners for the seat frame, the tenons being 1¼ in. x ¾ in. The two side frames should now be glued up with very hot and thin glue.

The seat frame is composed of two sides, 1 ft. 10 in. x 2½ in. x 1 in., two ends, 1 ft. 8 in. x 2 in x 1 in., and four rails, 1 ft. 8 in. x 1½ in. x 1 in. The ends should be tenoned into the sides and the rails into the ends, all tenons being ⅜ in. thick, and full width, with the exception of the front and back, which should be 1½ in. wide. For a distance of 9 in. the front of the seat frame should be cut back ½ in., to allow of it sliding between the front legs.

The back is composed of two sides, 2 ft. 6 in. x 2 in. x 1 in., and six rails each 1 ft. 6 in. x 1½ in. x 1 in. with the exception of the top and bottom rails, which are 2 in. wide. The seat and back frames should be hinged and fit easily in position.

In some adjustable chairs the hinged back frame rests against a hardwood or metal rod which lies in slots cut in the arms, as shown in Fig. 3. The backward slope can be varied by changing the rod from one pair of slots to another. The cross rail which ties the arms together forms a secondary support for the back frame, should the rod become dislodged.

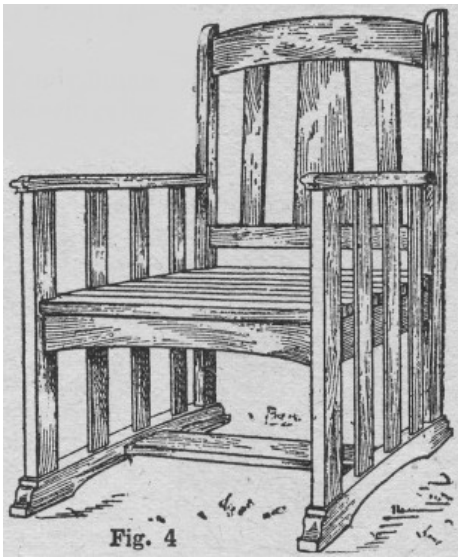
The arms for a chair of this kind are shown in plan in the illustration, which also clearly indicates the shape and arrangement of the slots. Four slots are cut in each arm, 1 in. wide at the top and ¾ in. high by ¾ in. deep, cut on the slope in the manner shown. The slots are 1 in. apart.

The cushions are both 1 ft. 8 in. wide and 3 in. thick, one being 2 ft. 3 in. and the other 1 ft. 10 in. long. Two bags should be made of hessian to these dimensions, and filled with either horsehair, fibre or flock, and sewn at intervals of 4 in. all over to keep the filling in position.

The covers should be made separately and fitted on, but they may be buttoned, especially if made of imitation leather or tapestry. A better decorative effect is given if either brown velveteen or hair seating is used for the cushions, without buttoning, and the edges piped. Closely woven tweeds in tones of beige, piped with imitation brown leather, or heavy corded fabrics in geometrical patterns are suitable to the lines of this framework. The seat and back may be upholstered direct, and in this case the inner rails of both frames should be omitted, and webbing used instead.

Garden Armchair. Fig. 4 shows a comfortable garden armchair. It should, if possible, be carried out in oak, but any of the harder whitewoods may be substituted. The chair is as suitable for indoor use as for the garden, and, fitted with loose cushions, it will make a comfortable seat for the sitting-room or library. A feature of the design is that the legs are not square posts, but are of 2 in. x 1¼ in. section.

The construction is simple and straightforward, and is shown in detail in Fig. 5. The legs may be tenoned right through the struts and wedged.



Armchair. Fig.4. Strong chair suitable for garden use.

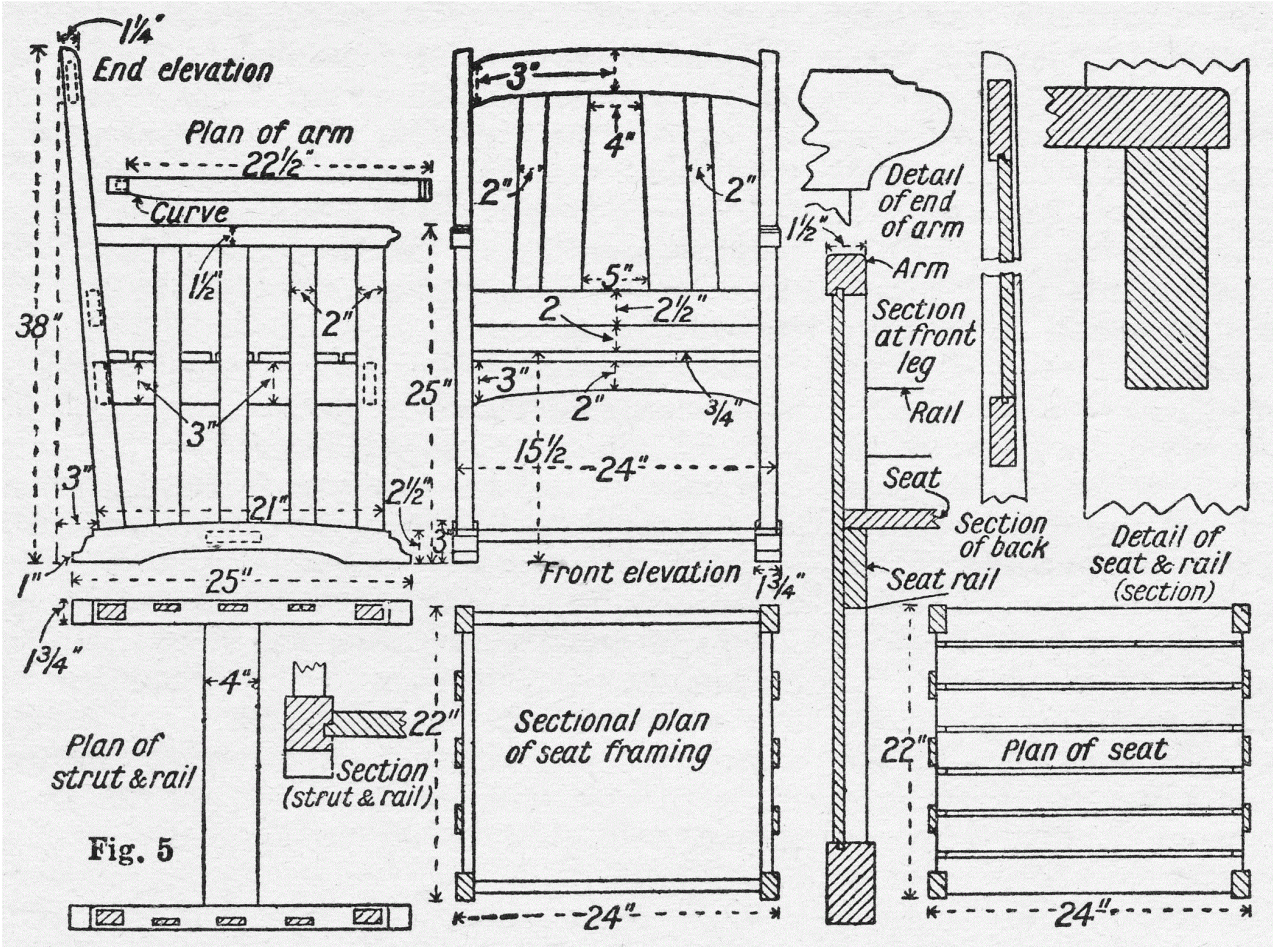
The seat rails and back rails are tenoned in the usual way, while the strut rail, the side slats, and the back slats are rebated in. The seat laths are nailed on, and the side slats may be nailed or screwed to the side seat rails. The arm is tenoned to the back leg, and is secured to the front leg by means of a stub tenon.

	Length	Width	Thick-ness
Two front legs	25	2	1¼
Two back legs	38	2	1¼
Two struts	26	3	1¾
Strut rail	23	4	⅞
Front seat rail (shaped)	24	3	⅞
Back seat rail	24	3	⅞
Two side seat rails	22	3	⅞
Seven seat laths	24	3	¾
Two arms	24	1	1½
Six slats (sides)	22	2	⅜
Lower back rail	24	2	1
Top back rail (shaped)	24	4	⅞
Middle slat (back)	16	5	½
Two slats (back)	16	2	½

The wood required is shown in inches in the above list. The lengths quoted allow for joints and paring, but all the thicknesses given are strictly net.

(See page 71 for armchair working drawings and details of construction)

ARMORIAL BEARINGS. An Englishman may legally assume any armorial bearings he pleases. Thus a chimney sweep from Whitechapel can, if he pleases, assume the arms of the Stanleys, the Grosvenors, or the Howards. If, however, he has them painted on his carriage, he pays two guineas a year tax, and if he displays them in any other position, e.g. on



ARMCHAIR WORKING DRAWINGS AND DETAILS OF CONSTRUCTION

his notepaper, he must pay one guinea a year. If a man is left an estate on condition that he assumes the name and arms of Blank, his best plan is to apply for a royal grant of the name and arms, which will probably be issued, but he will pay £50. He may get the same royal licence on a voluntary application for £10. It he covets armorial bearings, and applies to the crown or the College of Heralds for a grant of a coat of arms, it will also cost him £10. The penalty for displaying arms on a carriage or elsewhere without paying the tax is a fine of £20.

ARNEBIA. The best known species of arnebia is echioides, a hardy perennial from Armenia. It is about 12 in. high, and produces yellow flowers in May. Each blossom has five dark spots, fabled to be the marks of the fingers of Mahomet, hence its popular name of the Prophet flower. It is a curiosity for the rock garden (q.v.). Pron. Ar-nee'-bi-a.

ARNICA. The flowers and root of Arnica montana are employed in making preparations for bruises and sprains. Arnica flowers are to be preferred to the root for the purpose.

Tincture of arnica is made by soaking an ounce of arnica flowers in half a pint of weak alcohol or brandy for ten days, then pouring off the liquid. Squeeze the flowers in muslin, so as not to waste any of the tincture.

To make a lotion for sprains and bruises mix two tablespoonfuls of this tincture with enough water to make one pint of lotion.

Arnica opodeldoc is a handy form for rubbing purposes. It is made by mixing:

Soap	4 oz.
Camphor	1 oz.
Tincture of arnica	5 oz.
Strong alcohol	10 oz.

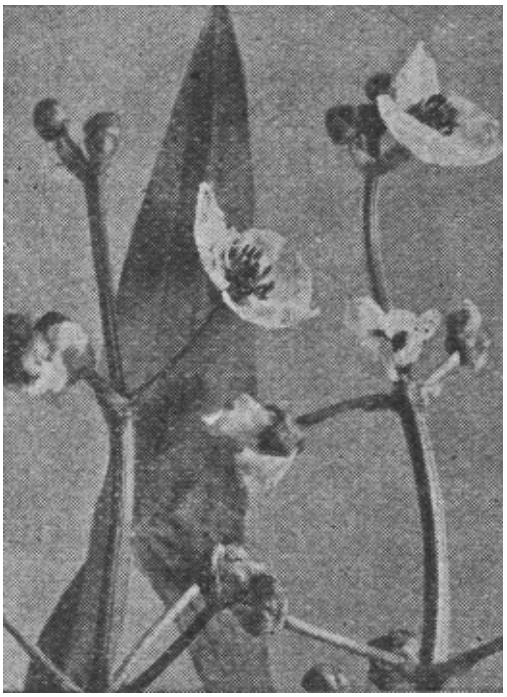
Carefully heat together until dissolved. It sets to a jelly when cold. To use it rub a small quantity in until the paste disappears.

Arnica should not be used on broken skin, as a disagreeable rash may be produced.

ARRAS. Named after the French town, the original Arras was handworked tapestry hung before the wall of the room, leaving a passage behind. An arras of cretonne will assist in making a loft or outhouse habitable at a minimum of cost, because it serves to exclude draughts. *See* Tapestry.

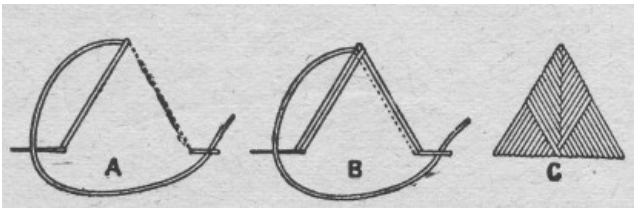
ARROWHEAD.

The best known species is the native Sagittaria sagittifolia, which has arrow-shaped leaves 3 in. to 6 in. long, and white flowers in widely spaced whorls in July. The numerous stamens have purple anthers. It is found in pools and is a good plant for the water garden, but the water should not be more than about 1 ft. in depth.



Arrowhead. Flowering shoots and arrow-shaped leaves.

ARROWHEAD: In Tailoring. Arrowheads are used on coats, skirts and tailored dresses, to give a decorative finish to dartlike seams and pleats, the sides of pockets, to cuffs, collars and the like. They are worked in coarse, buttonhole silk twist to match exactly the shade of the garment, except on navy blue when they are worked in black. Mark in chalk a triangle the size desired, with a straight line down the centre.



Arrowhead in tailoring. Diagram showing the stitch.

For the first stitch push the needle, from underneath, through the lower left-hand corner, carry up to top point of the triangle, and take up a tiny running stitch here towards the left, then carry needle down to the right-hand corner and insert here, bringing up the needle again at the left-hand side, but within the stitch first made, as in A.

Again carry the thread up to the apex, take up another running stitch, but this time just below the first, so that the thread crosses right-hand stitch and will cross both left-hand stitches when carried down alongside the right-hand stitch as in B. Continue thus, working first along one side of the triangle and then the other, the running stitches getting each time farther from the apex, and the others nearer to the centre of the base, until the arrowhead is completed as in C.

ARROWROOT. A pure starch powder, obtained from the maranta plant, grown in the West Indies and Bermuda. English arrowroot is prepared from potatoes. It is a valuable invalid food, being easily digested in cases of gastric irritation. To prepare, blend a dessertspoonful of the powder with two tablespoonfuls of milk or water, and pour over it half a pint of boiling milk or water. Stir briskly, then add a teaspoonful of sugar. If ordered, a teaspoonful of brandy or cream can also be added. *See* Cornflour.

ARROWROOT BISCUITS. Sieve ½ lb. of arrowroot together with ¼ lb. of flour and a dessertspoonful of sugar into a basin and rub into them ¼ lb. of butter until the mixture is free from lumps. The whole should then be formed into a stiff paste with the aid of a beaten egg, and, if necessary, a little milk. Knead the paste well, and when smooth roll out very thinly on a floured board. Cut into shapes and bake until golden brown in colour.

ARROWROOT PUDDING. Mix two dessertspoonfuls of arrowroot with a little cold milk, boiling what remains from a pint of milk, and pouring it over the mixture. If the latter does not thicken immediately the arrowroot is not sufficiently cooked, and the whole needs to be boiled up in the pan. After adding a dessertspoonful of sugar, leave the mixture to cool; then add the yolks of two eggs and lastly beat two whites of eggs to a stiff froth, folding them lightly into the mixture. Turn the pudding into a thickly buttered dish, and bake it in a fairly hot oven for a little more than half an hour.

ARSENIC. In medicine, arsenic is best known in the form of the oxide or white arsenic; it is used in anaemia, and also as a general tonic. A favourite preparation is Fowler's Solution or Liquor Arsenicalis. Arsenic is very useful in the debility which results from malaria. It is found in rat poisons and in weed-killer.

Arsenic Poisoning. In cases where an overdose of arsenic has resulted in acute arsenical poisoning the chief symptoms are vomiting, continuous diarrhoea, abdominal pain, and great weakness. Give the patient emetics of warm mustard and water (a tablespoonful of mustard to half a pint of water).

The antidotes for arsenic are dialysed iron, tablespoonful doses in water every ten minutes, or magnesia given freely in water. Later give the whites of two eggs beaten up in a glass of equal parts of milk and water. The patient should be kept warm in blankets, with a hot water-bottle at the feet. Nothing but milk should be allowed for the first week after recovery.

The earliest symptoms in chronic poisoning may be cold, running eyes, sneezing and cough; or there may be loss of appetite, nausea, vomiting and diarrhoea. Itching of the eyes is a usual sign when a person is taking arsenic that the dose should be reduced. More serious effects are observed—inflammation of nerves leading to weakness and unsteadiness of the gait, drop-foot and drop- wrist, and increased sensitiveness of the skin.

The only treatment of any avail is to remove the patient from all possible contact with arsenic, and to build up his general health by some tonic, such as Easton's syrup, ½ to 1 teaspoonful in a little water three times a day after meals, while nature expels the absorbed arsenic from the system. If the digestion has been greatly upset a very light diet, consisting chiefly of milk, milk puddings, custards, etc., is necessary. Where there is the slightest suspicion of chronic poisoning the advice of a physician must be sought. *See* Antidote; Poisoning.

ARSENICAL SOAP. This is a paste employed by taxidermists for preserving the skins of birds and animals that are stuffed and mounted. Its use depends upon the fact that arsenic is a very powerful antiseptic and preservative, but its poisonous qualities render it necessary to use it with great care. The paste or soap is made as follows:

White arsenic	4 oz.
Camphor	6 dr.
Charcoal	1 oz.
Slaked time	4 oz.
Carbonate of soda	12 oz.
Soft soap	4 oz.

Water sufficient to make a stiff paste.

It should be mixed in a mortar.

The charcoal gives the paste a grey colour that prevents it being mistaken for a harmless preparation. The soap is used by spreading it on the inner side of the bird or animal skin. *See* Taxidermy.

ARSON. This word is used in English law for the wilful burning of a house belonging to someone else, or of a place of worship, public building, or building owned by a public company. Arson is a felony. *See* Fire; Insurance.

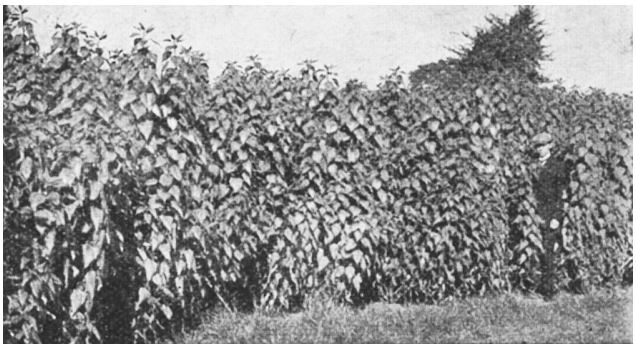
ARTHRITIS. Term used by medical men for inflammation of a joint or joints. *See* Inflammation; Joints; Rheumatoid Arthritis.

ARTICHOKE: To Grow and Cook.

Plants belonging to three different genera are grown under the name of artichoke in Great Britain, namely, the true or Globe Artichoke, Cynara scolymus; the Jerusalem or tuberous Artichoke, Helianthus tuberosus; and the Chinese Artichoke, Stachys tuberifera.

Jerusalem Artichoke. The plant is a hardy perennial, growing from 8 to 12 ft. high in a season, the stiff green stem, without side branches, bearing roundish rough leaves on short stalks. The rootstock is tuberous. In the common species, the tubers are pink,

very numerous, and variable alike in size and shape. Each plant will produce from half a peck to a bushel of tubers per annum. The white-tuber variety is superior in flavour to the other kinds.

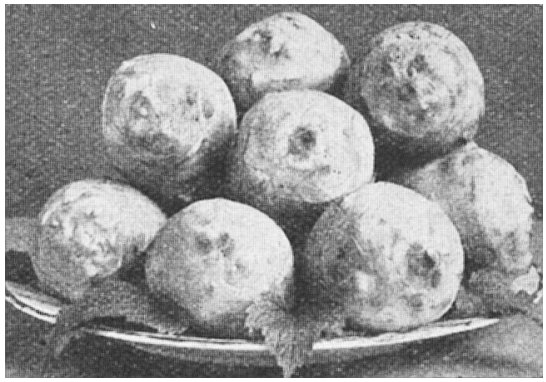


Large patch of Jerusalem artichokes, growing to well over 6 ft. high, showing their close rsemblance in foliage and growth to giant sunflowers.

Planting should be done in early spring and the sets covered 4 in. deep. They may be planted about 18 in. apart, rather more in rich soil. A light hoeing up of the soil over the tubers once or twice during the summer is beneficial. In September the plants cease extension and the leaves lose colour and droop. The stems may be cut down in October. From that time the tubers may be taken up at intervals for use as required, The plant enjoys a liberal dressing of decayed manure. In fertile soil the smallest of sets or seed-tubers will produce a strong plant and a heavy crop.

Globe Artichoke. This is a perennial and the young flower-head forms, with the fleshy receptacle, a close ball, globular in shape; it is this which is the edible part. Seedsmen usually list at least two varieties—the Green Globe and the Purple Globe; the seed may be sown out of doors in spring in a drill and covered with an inch or so of soil. The seedlings should be thinned and planted out about 4 ft. apart when strong.

Those who have established plants can get strong plants from suckers. In each case three or four shoots should be left on the old plant. Those removed should be set 3 ft. apart, with 4 ft. between the rows, and bedded firmly in with moist soil.



Artichoke. Tubers of Jerusalem or white artichokes ready for cooking. (Photo from Sutton & Sons)

The stage for gathering the globe is when the scales begin to spread and before the flowers have time to open; a portion of stem should be taken with each. When all have been gathered the stems may be cut hard back, together with the decayed leaves, and the soil round the plants mulched with fine ashes, seaweed, or stable litter. In cold districts the soil ought to be ridged up over the stools and litter thrown on. In spring a dressing of manure may be given. After the fourth year the plants, having become exhausted, should be replaced by fresh stock.

The Chinese artichoke is an edible-rooted species of Stachys, growing about a foot high. The tuber ranges from 1 in. to about 3 in. in length and may average an inch thick at the centre. The flavour resembles that of the Jerusalem artichoke.

Medium sized tubers are selected in spring and planted 3 in. deep and a foot apart in rows 18 in. asunder. Any well-drained soil will do, but it should be friable. Fresh manure is not desirable. In autumn the tubers should be lifted and stored in dry sand.

How to Cook. When Jerusalem artichokes are peeled place them immediately in a bowl of water to which a little vinegar has been added or they are apt to become discoloured. Have ready a pan of boiling salted water, add a little vinegar, put in the artichokes and boil gently for about twenty minutes. They break easily, hence the water must not boil too fast. When the artichokes are tender, drain them, place in a vegetable dish and send to table well covered with white sauce.

Jerusalem artichokes may be mashed if preferred. When boiled, rub them through a fine sieve, flavour with butter, pepper and salt, add a little cream and heat up in the oven.



Artichoke. Basket of young flower-heads of the globe artichoke.(Photo from Sutton & Sons)

To make artichokes and cheese, boil six artichokes till tender, then mash them with a fork, and add pepper, salt, lemon juice, and some cayenne pepper. Place a layer of this in a small pie-dish, then a little grated cheese, and then a little more of the artichoke mixture. Scatter breadcrumbs and cheese over it, bake for 10 min. in a quick oven and serve very hot. This is

sufficient for four persons.

Globe artichokes are served as a separate course, usually after meat, with either a sauce made of equal parts of oiled butter and lemon juice or sauce Hollandaise (q.v.). Only the lower portions of the leaves and centre of globe artichokes are edible.

Before boiling take off coarse outer leaves and cut away the stalk. Wash thoroughly to remove any grit or insects. Place the artichokes in boiling salted water, head downwards, and boil quickly without putting on the lid of the pan for about half an hour. Drain in a colander and arrange in a dish, tops uppermost. The sauce is sent to table in a sauce-boat and not poured over the vegetable as with Jerusalem artichokes.

ARTICHOKE SOUP. Also known as Palestine soup, this requires 2 lb. artichokes, 1 small turnip, 1 onion, ½ pint milk, 2 pints white stock (2½ pints milk if a meatless soup is preferred), 1 small head of celery, ½ oz. flour, 1 oz. margarine. Pare and wash the vegetables, cut up and boil gently in the stock till tender. Melt the margarine in a separate saucepan, stir in the flour and add milk, stirring till the thickening is smooth. Rub the vegetables through a sieve, return to the stock, add it to the thickening, season to taste and boil up. Serve very hot with dice of fried bread. Sufficient for five persons.

Artificial Fertilisers. This term is used for manures manufactured by the aid of chemicals. *See* Fertiliser.

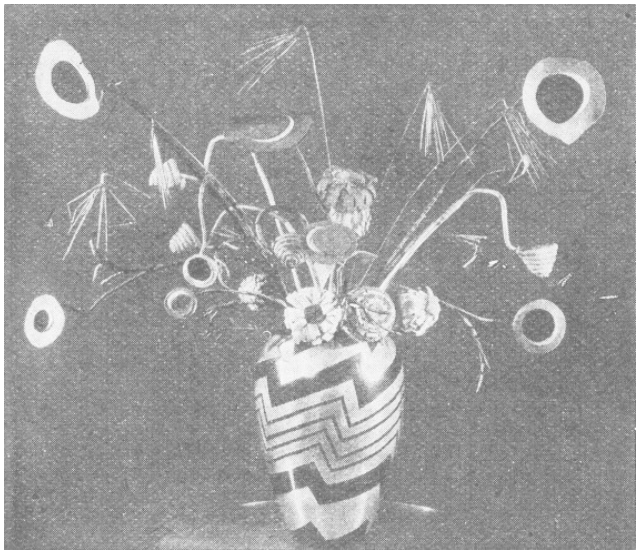
ARTIFICIAL FLOWERS: HOW AMATEURS CAN MAKE THEM

Using Materials of Many Kinds for Dress and the Decoration of the Home

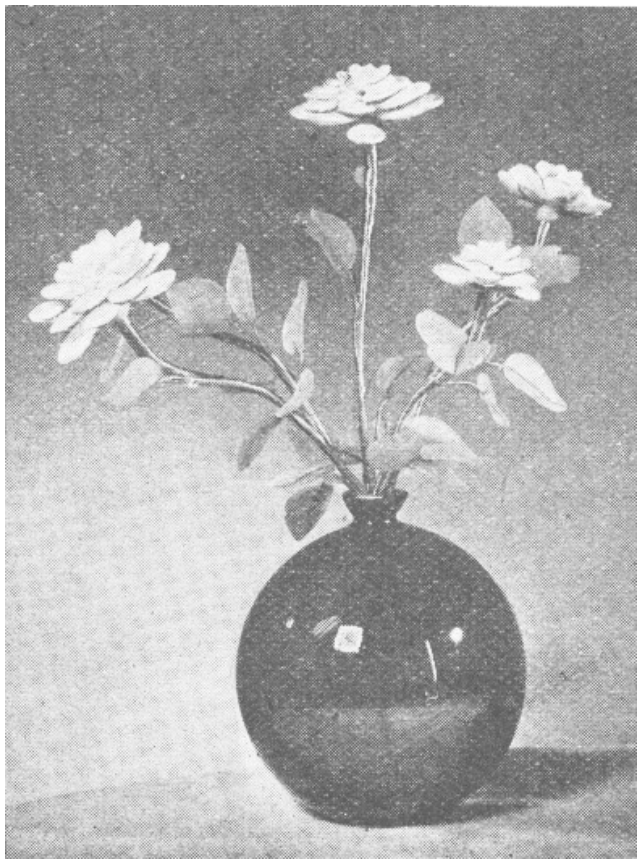
Related information will be found under the particular materials used, e.g. Paper; Raffia; Shells; Silk, etc.

Made of shells, fish scales, glass, knitting yarns, raffia, scraps of silk, cotton, velvet or felt, of crêpe paper and of leather, artificial flowers of all kinds can be selected for dress, fancy work, table and Christmas decoration.

Shells and glass lend themselves to original and striking designs for conventional vase sprays and for floral trees of the weeping willow type on solid glass blocks and fancy stands. Glass flowers are brittle for personal wear, though used in small posies, and shell flowers are rather stiff. Fish scales are light and adaptable for this purpose. For shell and glass flowers, leaves of the same material have a better effect than the ordinary artificial foliage which is often used. Mother of pearl shells, which do not require tinting, are sold from 1s. a dozen (prices vary according to required size), miscellaneous shells from 3s. a pound, and fish scales about 1s. an ounce. French enamel varnishes are suitable for colouring all shells and scales, and cost 9d. a bottle. These can be intermixed to obtain other shades and removed or lightened in colour by use of methylated spirit. Leaves and petals are supplied in crystal or in coloured glass for a few shillings a hundred. Where a pearly sheen is liked on glass flowers, a mother of pearl solution is obtainable, to coat the petals.



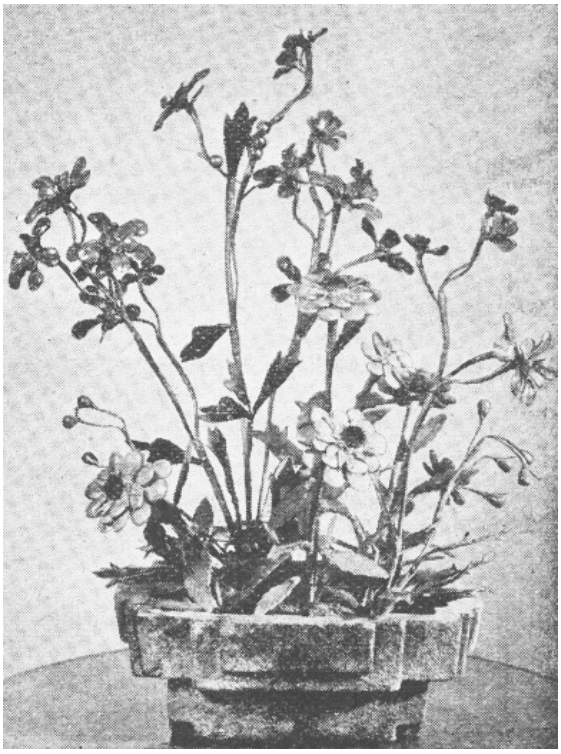
Artificial Flowers. Mixed bunch of flowers made from shell, felt, cork and raffia, and mixed with dried grasses.



Artificial Flowers. Glass camellias with glass leaves.

Besides these materials, flower centres, varieties of stamens and foliage, stems, wire, brown or green gutta

percha, various kinds of calyx and tools for piercing shells can be obtained or ordered at art shops and art departments in stores. Small camel-hair brushes are best for tinting; clean them with methylated spirit after using the enamel varnish.



Artificial Flowers.Conventional flowers, buds and leaves made in glass and stuck in sand.



Artificial Flowers. A flower greatly enlarged to show the details of construction.

Anemones Made From Shells

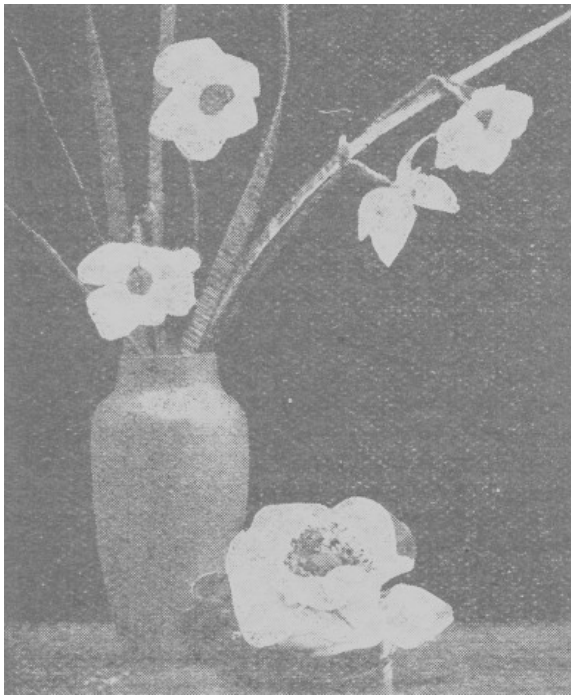
Anemones are effectively made in shells and are easier to tackle than roses, water lilies, camellias or apple blossom, though all these flowers are suitable for this work. Select five shells the required size of anemone petals, pierce, from inside, the thickest part of the shell where the hinge is, with two holes, a quarter of an inch apart, thread with wire, working from inside shell. Wire the five thus, and then colour. For a red anemone, a brushful of crimson enamel varnish would start from the top of the petal and blend with a little mauve from the base, where afterwards a small dab of black should be used, as seen in the natural flower. The painted shells will dry in about five minutes. Both sides must be coloured and various tints will be suggested by the real flowers for sufficient blooms to make an effective vaseful. Have at hand a little cotton wool and dab off colour if wrongly applied.

Take an anemone centre, surround with stamens (ready made), wired together and spaced evenly round the centre, and then wire to a piece of galvanised wire for the stem. Next wire the coloured petals to this stem by the wires already fixed to them. Green sealing wax may be used to hide the mass of wires beneath the petals. After a short piece of rubber tubing has been pushed up over the wire stem a special readymade anemone stem is used to which short leaves, as found on the real flower, are attached. This should be gummed on to complete the flower.

By piercing the shells at the thin top edge incurving petals are obtained. Thus, when making a rose or a water lily, the central petal shells are pierced at the thin edge and the outer or open petals are pierced, as in the anemone described, at the hinge side. For a bud all the petals would be pierced on the thin top edge. A special calyx is obtainable for a rose and double-ended yellow stamens.

Natural twigs are often used for almond or apple blossom, gutta percha strips in a matching colour concealing the wiring of the bloom to the twig. For large leaves, flat sun shells are obtainable from 3 to 4 in. in diameter, and can be cut with special cutters to the desired shape and coloured after piercing.

With large shell flowers, rattling of petals caused by too loose wiring must be carefully avoided. Glass flowers are made in the same manner as shell, but gold, silver or silk-covered wire is used. For heavy flowers or tree effects the stem wires must be extra stout.



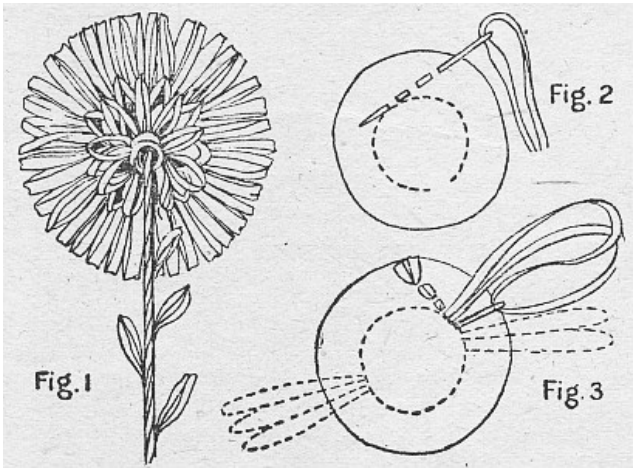
Artificial Flowers. Narcissi made from shells, the leaves being of cardboard covered with green raffia. The rose is also in shell.

Fish scales are good for making small flowers when an enamelled effect is liked for millinery purposes. One side of the scale has a satin finish and should be used for the upper sides of petals. These can be curled round

on a knitting needle if desired, cut to shape with scissors and holes pierced for wiring with a stout needle.

Fish Scales Used lor Violets

To make violets, select five fish scales, four about the size of a sixpence and one of a three-penny-piece: cut five lengths of wire, 7 in. long, wire up the scales, and then colour both sides with violet enamel varnish. Take a violet centre and arrange the coloured petals, two at the top, one at each side and the small one at the bottom, overlapping. Twist the wires of the petals together firmly to make the stem foundation. Bind a narrow strip of green gutta percha round this and finish. Ordinary artificial violet leaves may be used, or leaves cut out of green suede, to complete a bunch of a dozen violets tied up with raffia.



Artificial Flowers. Fig. 1. Daisy made in raffia. Fig. 2. How to start making the flower. Fig. 3. How the petals are formed.

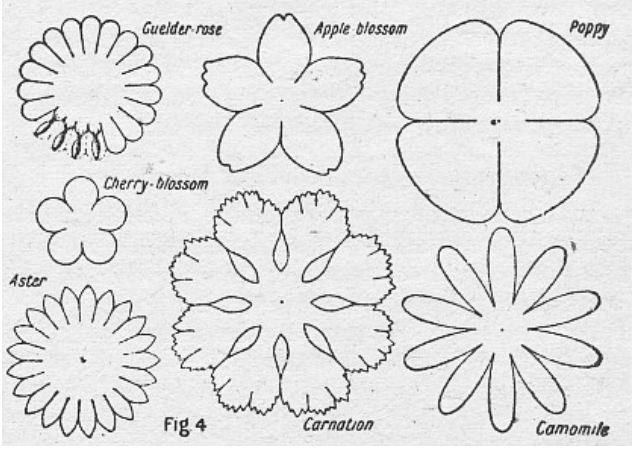


Fig. 4. Simple shapes for cutting out flowers in silk, cotton or crêpe paper.

Wool or chenille flowers for attaching to knitted work or for posies are usually very simple, effect being obtained by the use of bright colours. A wool needle may be threaded with the yarn, a loose knot made and loops worked with this, overlapping each other all round. About a dozen loops of wool should suffice. The centre i s formed either with a bought flower centre with a wired stem, or by attaching the flower to the article to be trimmed with French knots of wool in a contrasting shade. Leaves are easily crocheted to shape and wired if necessary, or cut-out felt leaves may be used for a posy.

Raffia flowers usually start with a canvas foundation, from which the loops of raffia may be worked. Daisy-like flowers (Fig. 1) can be made on a circle of canvas rather larger than a penny with an inner circle marked the size of a farthing. To start, thread a raffia needle with the selected colour and darn into the canvas to avoid a knot (Fig. 2); from the centre circle edge make a loop 1 in. in length, taking the needle back close to the starting point (Fig. 3). Pass the needle under the centre circle, bringing it out opposite loop just made. Take needle back again, leaving a similar loop, making it as close as possible to the first one, and continue all round till the circle of petals is complete.

The centre may be of looped yellow wool or small wooden beads sewn on the canvas. The back is finished off by cutting away the canvas near to where the petals start and covering with green raffia in loops until the remaining canvas is hidden. Through the back, wire is passed to form the stalk about 8 in. long. Use double wire and wind round with brown raffia. To keep the raffia in place, pass it through the flower, when it may be bound with a little brown cotton. Wire in an occasional loop of green raffia on the way down the stalk, as shown in Fig. 3.

Flowers of Ribbon, Silk and Paper

Narrow ribbon flowers can be made in the same way. Circles of felt, skiver or suède, with slit edges, in diminishing sizes, form conventional asters with bead flower centres and wired stalks covered with gutta percha or raffia. More ambitious leather flowers require a knowledge of tooling and use of leather implements *(see* Leather Work).

Simple shapes for cutting out flowers in silk, cotton or crêpe paper are shown in Fig. 4. Ready-made stems, centres, stamens and leaves can be used if an attempt at natural flowers is desired. After cutting out, if the petals are to be coloured, it is a good plan to pin material to white blotting paper, wet slightly with clean water on a small sponge, and tint with water colour to which add a little gum. Aniline dyes are quite useful for this purpose."

In using crêpe paper for decorative flowers suitable for Christmas, cut the paper with the grain, use as little adhesive as possible, and allow pasted petals, etc., to dry before using them. Fold the paper into several thicknesses so that several petals or leaves may be cut out at one time, draw or trace design on top fold and use a sharp pair of scissors.

To make a daffodil or a bell flower, turn down the end of a wire and cover with the paper to make a small head on to which to fix six stamens, each made from a square inch of paper, twisted tightly between the fingers to form a thread. Cut the bell or cup three inches square and join with paste. Turn the top edge

slightly over, stretching the paper a little. Put over the centre of the flower and bind with fine wire. For the daffodil cut six petals and also bind these with a sheath of brown crêpe, pointed at one end, at the base. The bellflower is finished underneath by a calyx cut from a circle of green paper into points. Stalks are bound with crêpe.

Many variations on these schemes will soon suggest themselves. Glass beads may be used for blossoms with shell or glass leaves, and effective flowers can be made of American cloth with wool or bead centres.

ARTIFICIAL LIMBS: Their Care.

The sockets of artificial limbs (those portions which enclose the stumps or remains of the lost limbs) are made of wood, composition such as celluloid and certalmid, etc., or of metal such as aluminium alloy. They should fit the stump accurately.

For the sake of cleanliness the socket should be sponged out with warm water and then carefully dried with a cloth, at the end of each day's wear. In the case of a wooden socket, if the varnish has been rubbed off, it should be renewed; if the surface of the wood is rough or uneven it must be smoothed down with fine glasspaper before the varnish is applied.

Metal joints, except those which have leather bushes, should be kept lubricated with oil. If from wear they become too loose so as to rattle, or allow improper movement, they will need repair or renewal by the limb maker. The joints which are usually bushed with leather are the knee and the ankle. The leather which is used for this purpose is thoroughly impregnated with grease, and needs no additional lubricant. When a bushed joint becomes too loose it must be rebushed by the maker.

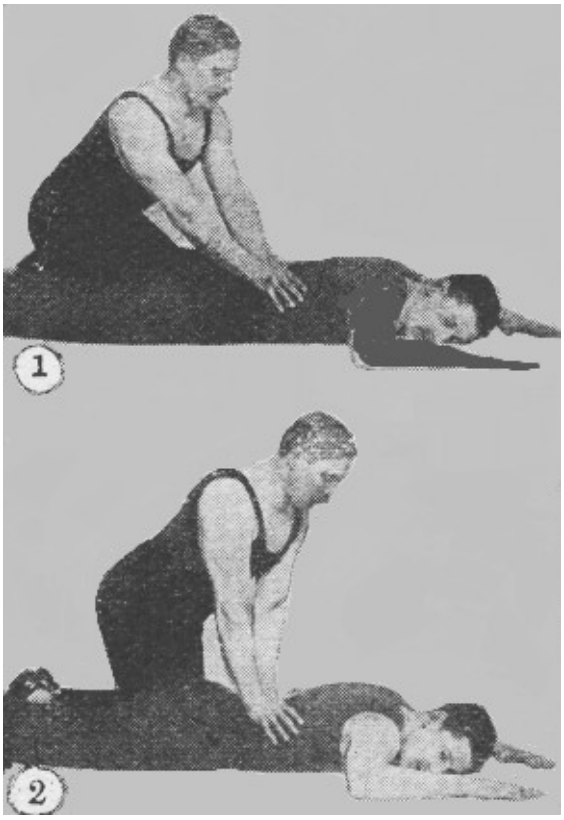
In some of the older pattern legs the ankle-joint is of wood of the mortise and tenon type, connected by means of a leather-bushed bolt. When these joints become worn so as to allow of undesirable side play, they must be rebushed and packed. These joints are usually controlled by tendons and steel spiral springs.

In the standard types of limbs generally supplied by the Ministry of Pensions, the ankle-joint is fitted with rubber buffers, which are compressed by tightening two nuts in the sole of the foot. If adjustment of these nuts fails to make the ankle movement satisfactory, it is probable that new rubber buffers are required. The foot is easily detached when the nuts and locking plate have been removed. Certain limbs are fitted with rubber feet. All others have a separate toe-piece, hinged on its lower edge and having steel or rubber compression springs which maintain extension.

As a rule, wearers of artificial limbs should not attempt to take them to pieces themselves, as special tools are needed and special experience to reassemble the parts. Oil gradually disintegrates rubber, and care must be taken to prevent its coming in contact with the buffers.

ARTIFICIAL RESPIRATION. This is a method of restoring breathing in cases of drowning, gas-poisoning, etc., by alternately expanding and contracting the patient's chest, so that air is drawn into and expelled from the lungs. The method usually employed is Prof. Schäfer's. The subject should be placed face downward on the ground, with the arms stretched out in front, and the face turned to one side. The operator kneels astride or sometimes beside the prone body, facing the head, his knees being about the level of the unconscious man's hips. He then places his hands, one on each side of the patient, over the lowest ribs, with the thumbs parallel and nearly touching. Leaning forward and downward, he presses the base of the ribs upwards and inwards.

In this movement the arms should be kept quite straight. The result is that the air is expelled, and any water in the lung tubes is pushed out through the nose and mouth. At the end of the movement the rescuer swings back into an upright position, still leaving his hands flat against the patient's side. The first part of the movement should occupy the time necessary to count slowly 1, 2, 3, and the second, 1, 2. Care must be exercised that the hands are actually on the ribs, as seen in the illustrations, and not down on the loins.



Artificial Respiration. In Schäfer's method the ribs are alternately compressed (2) from behind and released (1), this last causing chest expansion.

The whole double movement, consisting of the pressure forward and the withdrawal of pressure, should take about five seconds, and should be continued rhythmically until the patient shows signs of recovering consciousness.

When the patient begins to breathe by himself, artificial respiration may be discontinued and the operator should now turn his whole attention to

stimulating the circulation by various means.

As soon as possible, in a drowning case, the patient's wet garments should be removed and he should be wrapped in warm flannel blankets, and carefully protected hot-water bottles or bricks warmed in the fire should be placed in the armpits and against the soles of the feet. The arms and legs should be vigorously rubbed, always in the direction towards the body, to force the stagnant blood back to the heart.

After the patient is sufficiently recovered to swallow, a little hot water may be given, or small amounts of heart stimulants, such as a teaspoonful of brandy in warm water or a small cupful of hot, strong coffee or tea, or a teaspoonful of aromatic spirits of ammonia in a small wineglass of water.

ARTIFICIAL SILK. Artificial silks are made by different processes, and there are various qualities. They are made by forming artificially a gelatinous material, hardened in contact with air or in passing through a trough of hardening fluid. This jelly-like compound is obtained by dissolving raw cotton or wood pulp. For artificial silk it is made into fine threads by being forced through minute holes, and endless lengths of filament are thus secured. Usually about a dozen of these are twisted lightly together to compose a single thread for machine-knitting or weaving. In the ordinary thick 2-ply cord used for knitting there are generally about 24 of such threads and nearly 300 original filaments.

Short-fibred artificial silk can be spun like wool or cotton, and certain mixed artificial silk and wool knitting yarns are made by blending the two materials together, when the bright silk speckles the yarn.

A good point in artificial silk for furnishing fabrics is its brightness of surface, and this varies with the amount of twisting received in making the ultimate filaments into yarn. Tight twists wear better than slack ones, but they make the thread wiry and less flexible.To reduce the brilliance and obtain a crêpe de-Chine lustre, several fancy-twisted knitting cords are made.

Reckoned per 4 oz. hank, artificial silk is cheaper than real silk, but it is not actually so much cheaper to use because it is heavier than natural silk, of which fewer hanks are required to knit the article. Artificial silk should not be knitted or crocheted too tightly or with too fine a needle.

Artificial silk can be distinguished from natural by touching an end of thread with a match flame. The artificial will burn freely with a white flame, leaving little ash behind. Natural silk is nearly non-inflammable. The flame does not run and the ash forms itself into a knob and at the same time a slightly unpleasant smell is emitted.

Care must be exercised in washing. Tepid water should be used and a pure soap. On no account should the article be mangled. After rinsing, the excess of water may be gently squeezed out inside a towel.

Artificial silks made by different processes behave differently in the dye bath, and an experiment should first be made by dyeing a sample of the material.

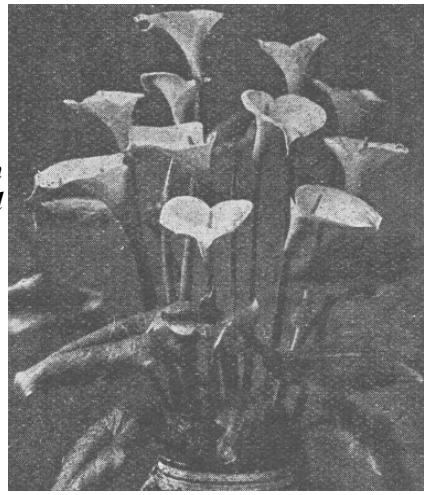
ARTIFICIAL SKIN. Collodion, or a preparation like it, is used to paint over fresh, clean cuts or hacks to protect them from irritation or infection. These preparations should not be used where the wound is dirty or discharging, as harm is done if the discharges are pent up. *See* Collodion.

ARTIFICIAL TEETH: Their Care. Knowledge with regard to the care of sets of artificial teeth or dentures is necessary on account of the different nature of the material composing the teeth, and the base or plate to which they are attached. The artificial teeth or porcelain part should not be rubbed by anything in the nature of a tooth powder, otherwise the translucency and polish of the enamel may be lost or injured. When the surfaces of the teeth become discoloured, they should be well rubbed with the forefinger covered with white muslin moistened with soap and water.

The plate to which the teeth are attached may best be cleaned with a small toothbrush and whiting, special attention being given to hollows and crevices. Time and trouble are avoided by placing the denture at night in water to which a few drops of antiseptic have been added. By morning matter which is apt to adhere tenaciously to artificial plates is easily removed.

The difficulty of keeping gold plates and clasps bright is greatly overcome by putting them into a chlorinated antiseptic. Special care is necessary in the cleansing of bands or clasps and the parts in direct contact with the natural teeth.

Artificial teeth should almost invariably be taken out of the mouth overnight. Particularly is this necessary when some natural teeth are still present. In addition to the cleaning of the denture in the morning, it should be rinsed after every meal. Artificial teeth are fragile and easily broken.



Arum Lily which has produced a considerable number of blooms although grown in a small pot.

ARUM LILY. In spite of its name this beautiful plant, with its rich, green leaves and pure white flower

spathe, does not belong to the genus Arum, but to Richardia, and as Richardia Africana it is also known as the Lily of the Nile. It is grown in a fertile compost of loam and a third of decayed manure (preferably cow manure) with sand. Splendid plants can be grown in 6-in. pots, with abundant watering and liberal feeding with liquid manure.

In summer the plants are put out into the open garden in well-manured soil, and given occasional soakings of water in dry weather. They are potted up in September, and kept in a cool greenhouse in winter. Little Gem is a favourite variety, of which Godfrey's arum lily is a special form. There are also two yellow-flowered species, Elliottiana and Pentlandii, which are best grown in pots throughout the year. Pron. Air'-um.

ASBESTOS. Being a fibrous material which is non-combustible, asbestos has many uses for fire protective purposes. It has a low thermal conductivity, and is thus an excellent heat insulating material. As an electric insulating material it has been extensively used in electric heating devices of various types. It is made up in a number of different forms, such as cord, felt, mill-board, and in sheets suitable for building purposes.

Asbestos mill-board can be purchased in sheets from about ⅛-in. thickness upwards. The thinner boards can readily be cut to shape with strong scissors or a sharp knife, and used, for example, on cooking stoves to protect the utensils. When such boards are covered with linen or some similar material they make excellent table-mats. Asbestos can also be used to make joints in hot water-pipes, or on exhaust pipes of gas engines. Asbestos cord bound around the handles of pots and pans or on the knob of an oven door prevents burnt or blistered fingers.

Moulded asbestos is used in the form of briquettes, balls, etc., for gas heating stoves, the most efficient types being those with ample air spaces, as they radiate the heat better than the more solid patterns.

For building purposes asbestos is generally combined with other materials, such as magnesia or Portland cement, and is treated in various ways to render it waterproof. For amateur use sheets of such a material are very effective. There are several proprietary brands which can be obtained from most builders' merchants in convenient size. It has to be cut to the desired shape and nailed in place. The joints between the sheets are covered with strips of wood nailed to the "studding" or framework. The material can also be obtained in the form of tiles.

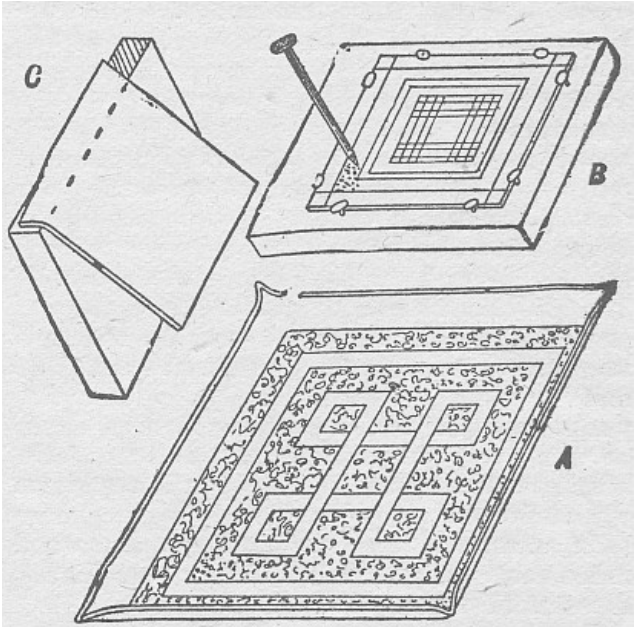
ASH. Tough, flexible, and able to resist shock without breaking, ash is a wood that is extensively used in many trades. It is light brown or nearly white in colour, with rather coarse grain, and the several varieties show certain differences in colour and appearance. For the handles of garden implements, hammers, hatchets, and other tools, ash is peculiarly well suited. It is used also for barrows, sticks and umbrellas, tennis rackets, hockey sticks, oars, and in gymnasia. It is also employed for furniture, and a thin veneer of ash does well on other wood. *See* Wood.

Ashbin. *See* Dustbin.

ASHES. The ashes from household grates may be utilised for various purposes. The first care is to see that all fuel and kitchen waste is so completely burnt that the ashes are thoroughly dry and powdery. Ashes should be well sifted and the coarser pieces burnt. The cinders are useful for the garden path or the hen-run. The fine, dry powdered ashes that pass through the sieve can be made up into a paste with water and used for cleaning the outsides of saucepans. *See* Dustbin; Refuse.

ASH TRAY. A simple form of tray is illustrated, which may be made without any of the special tools of the metal or repousse-worker. A piece of thin brass or copper sheet of No. 18 standard wire gauge, measuring 5 in. square, is required, both sides being first cleaned with fine emery cloth and oil, and the design drawn on with a lead pencil. The pencil lines may be lined in with a sharp metal point.

The plate must be secured to a piece of wood with strong tacks driven in close to the edge, and the background of the pattern covered with indentations made with the point of a large wire nail. The plate should next be removed from the wood and the edges lightly tapped over with a hammer, holding the metal on the edge of a narrow strip of wood and at an angle of 45°. The surface of the metal should be rubbed over with dry pumice powder, applied with a hard nail-brush and, after being warmed, coated with colourless lacquer.



Ash Tray made of thin metal sheet. A, finished tray. B, punching the pattern. C, bending the edges.

ASPARAGUS: Culture and Cookery. Asparagus is propagated almost exclusively from seed.

The kitchen garden species is officinalis, belonging to the order Liliaceae, a native of Great Britain. Favourite sorts are Connover's Colossal, Battersea and Reading Giant or Large Reading (Perfection is the modern type of this variety). The Giant French or Early Giant Argenteuil is grown by those who appreciate the large French type.

No crop of any importance can be obtained until the plants are three years old. The seed may be sown in spring, in fine, friable, well-prepared soil, and covered an inch or so deep. If more than one drill is sown, it is wise to allow a space of 18 in. apart. The seedlings may be thinned gradually to 6 in. apart and alternate seedlings transplanted in the following spring, leaving the others a foot apart. They may remain for a year in order to make strong rootstocks.

Asparagus is fond of salt at all stages, and sprinklings may be laid along the rows of seedlings during their first and second years. When the growth of seedlings decays at the end of the season, it should be cut away, and a dressing of manure spread over them.

Soil Preparation. The plant likes abundance of moisture while in full growth in summer, but is not suited by stagnant soil during the dormant period of winter. It does not dislike heavy soils, and will thrive on clay, provided the soil is well drained and is made friable. The soil should be laid up roughly in autumn or winter in order to let the frost get well into it. Any disintegrating material available may then be added. After lying for a few weeks exposed to frost, the soil may again be dug over, preferably with the fork. On a substantial loamy or clayey soil asparagus will thrive for many years with nothing more than an annual top dressing of salt and wood ashes, but in light land a heavy preliminary dressing of manure is desirable.

The laying-out of the beds should be completed sufficiently early in the spring to permit of planting before growth is much advanced. It is not advisable to plant more than four rows at the most, and three, or even two, suffice. The rows may be 2 ft. apart, with a foot and a half of space at each side.

Planting and Cutting. The correct time to plant asparagus is late in March or in April. In the first summer keep down weeds. In autumn the decaying tops can be cut away and the beds furnished with a suitable winter dressing.

In the absence of seaweed, a dressing of salt may be given to the bed in spring, a quarter of a pound per square yard being a suitable quantity; or the following dressing of chemical manure may be given:

Superphosphate of lime	*2 oz.*
Sulphate of ammonia	*½ oz.*
Sulphate of potash	*½ oz.*

Cutting may begin on established beds at or after the middle of April, according to the soil and district. With a strong bed any shoots of about the thickness of the little finger may be severed or broken off just below the surface. The first weakly shoots of young beds should be left intact. The crop is improved if soakings of water containing ½ oz. of nitrate of soda per gallon can be given during May and June.

Cutting should cease at the end of June, in order to allow the plants to make their annual growth, which will extend with great rapidity in July and August. Afterwards with the routine advised above a bed ought to yield heavy crops annually for a quarter of a century.

(For detailed methods of planting and forcing of asparagus see page 82)

Forcing Methods. Only strong roots, three years old or more, are suitable for forcing. These may be taken up in November and onwards throughout the winter until the season of outdoor cutting approaches. In large places there are frequently houses or pits with bottom heat which can be utilised, the roots being packed in boxes. Cucumber or melon frames may be used, the bottom heat being provided by a bed of manure and leaves. In this case, when the heat of the manure has begun to decline, a layer of three or four inches of soil may be placed on as a base for the roots, which may then be set close together and covered with the same depth of soil. A steady temperature of about 55° to 60° Fahr. is desirable. Produce may be expected to be ready for cutting in five to six weeks from the commencement of forcing. Tepid water may be given through a rose can if necessary to prevent the soil from becoming dry, and air should be admitted in favourable weather. The frame light should be covered in hard weather. The roots are of no further use after forcing.

How to Cook. Asparagus as a rule is served as a separate dish. If fresh when bought, the tips stand up firmly. The utensil used in cooking is a deep pan in which the bundle can be placed straight, only the tips being above the water. Should this not be at hand, put the bundle of asparagus flat in a large pan; and when done, lift out very carefully, so as not to break the points. Sauces to use are equal parts of oiled butter and lemon juice Hollandaise, or, when cold, vinaigrette.

To boil asparagus, cut the stems to an even length to fit the pan. Scrape the stalks clean from the tips downwards, taking care not to break off the heads. Tie in bundles of about eighteen, and place in cold salted water until needed. To cook them, put into boiling salted water and simmer until the heads are tender. Twenty minutes is long enough if the shoots are young. Take out carefully and drain, then place in a dish upon a slice of dry toast, which will absorb remaining moisture. The water in which asparagus has been boiled makes a good stock for soup. Drop a little butter over the tips of the asparagus before sending it to table. Serve the sauce in a sauce-boat.

(*Continued in page 83)*

ASPARAGUS

Fig. 1

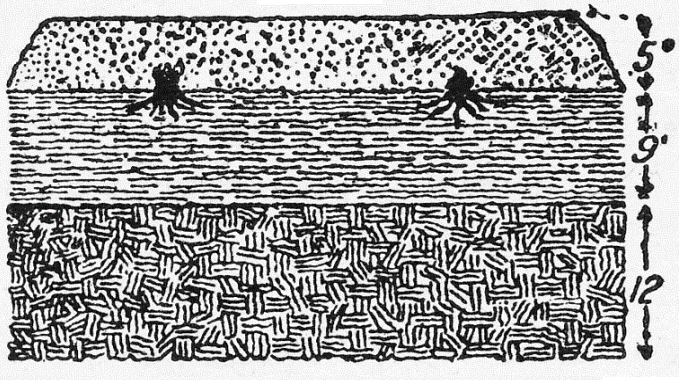


Fig. 2

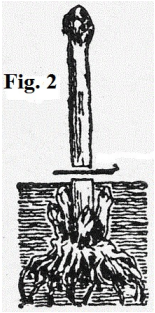


Fig. 4



Fig. 5

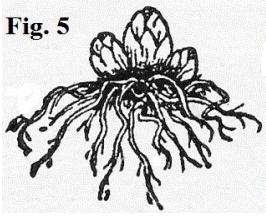


Fig. 7

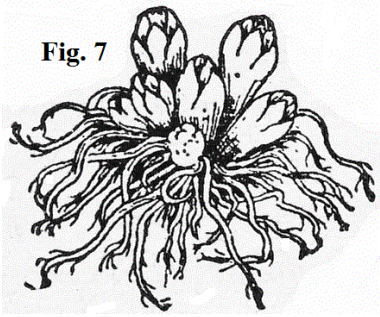


Fig. 3



Fig. 8

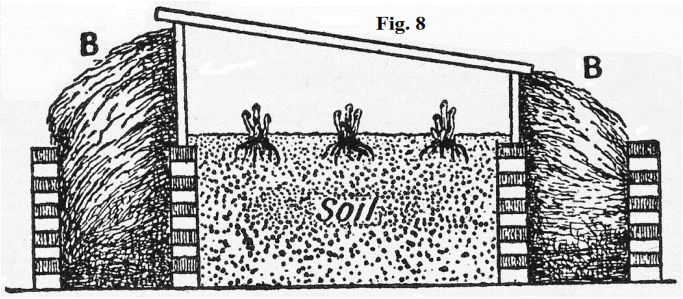


Fig. 6

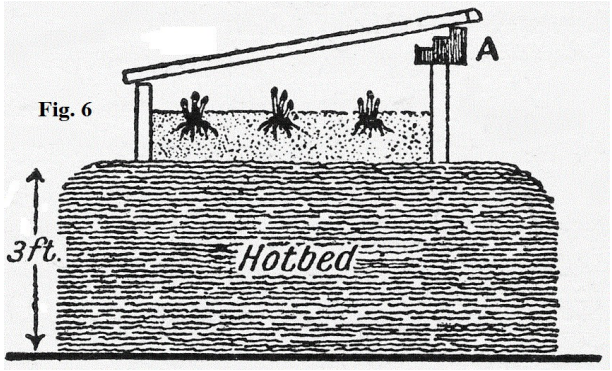
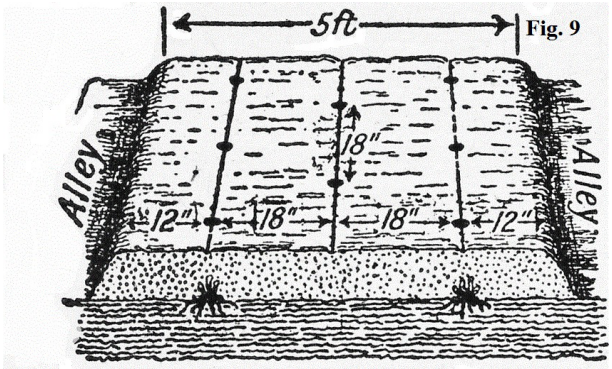


Fig. 9



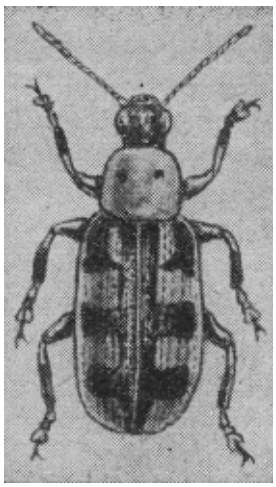
Asparagus: methods of planting and forcing.

1. Soil preparation and planting.
2. Where to cut stems.
3. Method of planting with crowns on ridges of soil.
4,5 and 7. One, two and three year old crowns.
6. Forcing in a frame over a hotbed of manure, with frame ventilated at A.
8. Forcing in a frame between sunk pathways filled with manure. B.
9. Measurements of bed for planting in the open.

ASPARAGUS AND CHEESE. Place a layer of boiled tops of asparagus in a pie-dish, and over it grate Parmesan cheese. Add a few pieces of butter and pepper and salt to taste; then add a second layer of asparagus with more cheese, etc., till the dish is full. Heat in the oven for 10 minutes.

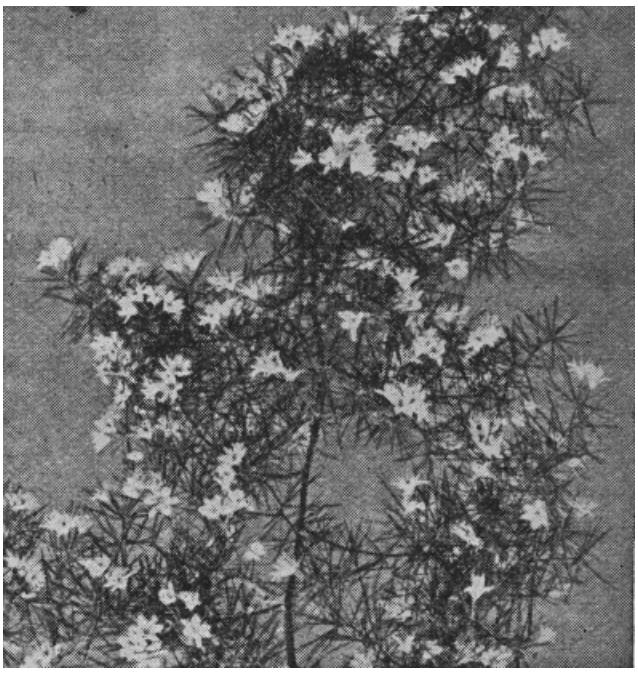
ASPARAGUS BEETLE. A small beetle with black head, dull red fore-body, and the wing-covers over the hind-body glossy black with an outer edge of brown connected with four yellow spots. The grey-green grubs are a pest on asparagus. The surest way to be rid of them is by hand-picking and destroying the beetles as soon as they emerge. In the grub stage they may be treated in like manner. Where this is not practicable, when the foliage is wet with dew dust it with finely-powdered charcoal, soot or lime, which will adhere to the larvae and destroy them.

They may be syringed with a solution prepared as follows: Boil 2 oz. of soft soap in a quart of water, stir in whilst hot 2 quarts of paraffin oil, and dilute for use with 4 or 5 gallons of water.



Right. Asparagus Beetle greatly magnified.

Below. Asparagus Fern. Foliage and flowers of a plant much used for table decoration.
(Courtesy of Country Life, Ltd)



ASPARAGUS FERN. The orange or black berries of the asparagus fern are pretty, but it is the decorative lightness of the foliage which is most admired. Among several ornamental forms Sprengheri is a good indoor plant, enduring the dry air as few others will. Retrofractus is a similar variety. Smilax (Asparagus medeoloides) is useful for table decoration. Plumosus and nanus are used with flowers for buttonholes. A compost of loam and leaf-mould in equal parts, with a sprinkling of sand, suits the plant best.

ASPARAGUS FLY. This is a small fly whose two wings are banded with brown. The body is dark brown and its hinder division crossed by four lighter lines. The flies may be seen from April to July, depositing eggs about the scales and leaves of asparagus. From the eggs, a fortnight later, emerge legless yellow maggots with dark heads. These bore downwards into the shoots and stems, causing them to turn yellow and rot.

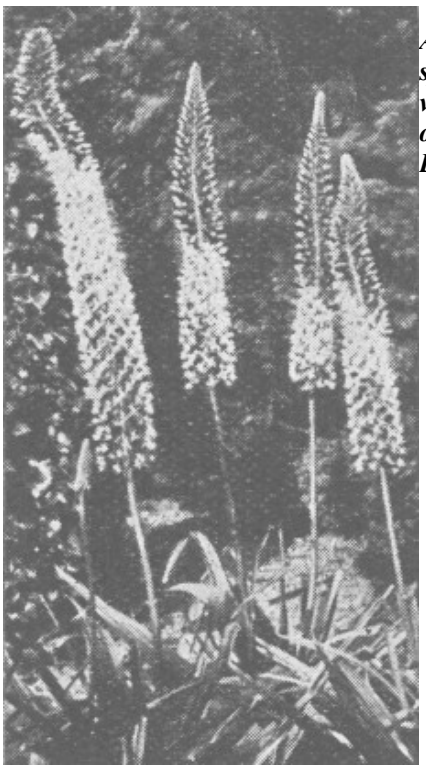
The flies may be caught early in the morning, settled on the plants; or traps may be set for them overnight by thrusting in the ground sticks whose exposed parts are smeared with bird-lime or other sticky substance, by which the insects will be held. Egg-laying is discouraged by dusting the young shoots with charcoal in fine powder. The grubs can only be destroyed by cutting out all yellow or brown shoots and burning them.

ASPARAGUS SOUP. Seasonable from March to July, for this soup buy the cheap bunches of slender green asparagus. Cut off the tips and boil gently for 10 minutes, then take out and set aside to garnish the soup when done. Now take the stalks of the asparagus, cut into pieces, and place in the boiling salted water, together with 1 pound of well-washed spinach. When tender, rub this through a sieve, and also set aside for a few minutes. In the saucepan melt 1½ oz. of butter, and gradually rub into it 1 tablespoonful of flour. When smooth, add to this mixture 1 pint of milk, heat, and put in the purée made of asparagus stalks and spinach, with enough boiling water to make the soup rich and creamy. Add pepper and salt to taste. Take off and garnish with the asparagus tips already boiled. Cream may be added. This is sufficient for four persons.

ASPHALTE. Strictly speaking, asphalte is pure bitumen, or natural pitch. Rock asphalte is a limestone naturally impregnated with asphalte. It is applied in its natural form, after suitable treatment, for the construction of road surfaces and other purposes. The term is frequently applied to natural and artificial compositions of a bituminous character The most practical way to use asphalte for domestic purposes is to buy it in one of its many specially prepared forms. Bitumen or asphaltic damp-proof courses can be laid by obtaining the material in the form of a sheet or roll, and setting it in position between the brick courses, or

wherever needed. To render a flat roof watertight there are numerous asphaltic compositions on the market that give good results. *See* Paths; Paving.

ASPHODEL. The sacred lily of Greek mythology is in gardening phraseology the Asphodelus, a hardy herbaceous perennial of Southern Europe, with white or yellow flowers. The species ramosus attains a height of 4 ft. in good soil; it has long, sword-shaped leaves and bears white flowers in late spring and summer. It does well in a shady place. Albus, closely related, is a smaller plant; acaulis, 18 in., bears pink blossoms, and comosus, 2 ft., white.

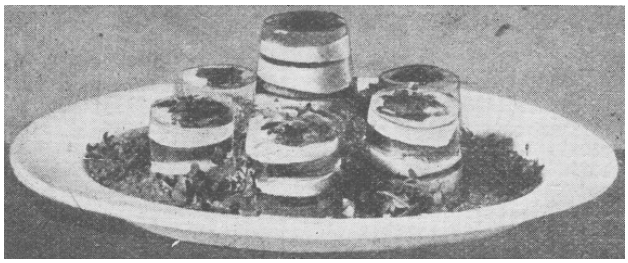


Asphodel. Flower spikes of the giant variety. (Courtesy of Country Life, Ltd)

Closely related to the Asphodel is Asphodeline, the principal distinction lying in the upright stems. The species lutea produces a tall stem, sometimes 3 ft. high, clothed with dark green furrowed leaves, and studded with large yellow fragrant flowers in early summer. It is a hardy perennial, well worthy of a place in the herbaceous border. There is a double form. Pron. Ass'-fo-del.

ASPHYXIA. The condition in which aeration of the blood has ceased or almost ceased owing to interference with respiration is termed asphyxia. It may occur in the course of disease or it may be accidental. Thus it occurs in (1) Drowning, when water takes the place of air in the lungs. (2) Blocking of the air passages, as in strangling, hanging, or choking, where a piece of meat or other foreign body gets into the windpipe, or where a large mass sticks at the back of the mouth or in the gullet. Or the blocking may be due to swelling produced by stings or by swallowing boiling water or corrosive poisons. Choking may also occur in diphtheria. (3) Compression of the chest, as when a person is buried by falling earth, etc, (4) Inhalation of coal gas, chlorine, sulphurous acid, and other poisonous gases. (5) Disease of the respiratory centre in the brain or paralysis of the nerves or muscles of respiration, as by certain poisons. (6) The treatment is to remove the cause, loosen tight clothing about the chest, draw forward the tongue and see that the mouth and throat are clear, and if breathing has stopped begin artificial respiration. Remember that more than one cause may be present. The cause will be dealt with as follows:

Strangling: loosen, or, if necessary, cut whatever is constricting the neck. Hanging: cut down. Choking: prize open the jaws, if necessary, with the handle of a spoon covered with a handkerchief, and endeavour to hook forward the obstruction, or, especially in children, invert the body and slap the back. Compression of the chest: uncover properly if from falling earth, or secure space when the cause is compression in a crowd. *See* Artificial Respiration; Suffocation.



Aspic. Savoury dish of hard-boiled eggs served in aspic jelly. (Courtesy of Ward, Lock & Co., Ltd.)

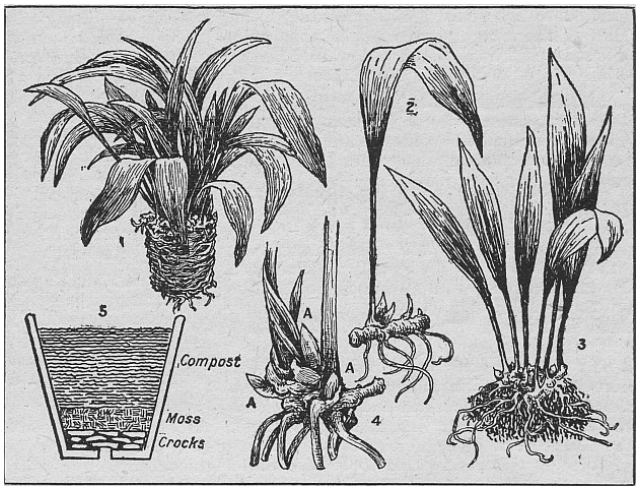
ASPIC. This savoury jelly is made from meat stock and gelatine or from calves' feet, and flavoured with herbs and sherry. Cutlets, eggs, prawns and other foods are embedded in the aspic jelly, to form dainty entrees or supper dishes, A recipe for aspic jelly is as follows:

Put ½ pint of water and 2½ oz. French gelatine into a clean saucepan, together with ¼ pint of sherry, the same quantity of chili, tarragon, and malt vinegar mixed, a bunch of mixed herbs, the juice of two lemons and the rind of one, a good sprinkling of salt, ten white peppercorns, the whisked whites of two eggs and their shells crushed, an onion, a carrot, and a turnip, and a stick of celery. Whisk all these together till they boil, and, after boiling up well, strain them through a cloth until clear. Serve in small moulds containing the prawns or other food required.

ASPIDISTRA. Green and variegated are the two forms of the aspidistra. They benefit by having the leaves sponged frequently with soapy water.

The variegated is the more delicate, and apt to revert to the type. The green leaves should be cut away as they come, and the plant kept away from draughts and fire heat. Compost, three parts loam, two parts leaf-mould, and one part sand. Propagation is by root

division and suckers in spring. Pron. Aspy-dis'-trer.



Aspidistra: dividing and re-potting. 1. Plant that needs re-potting. 2. Single leaf division. 3. Six-leaf division, the best way. 4. Root, showing the leaf buds at A. 5. Section of pot, showing correct preparation of soil.

ASPIRIN. Acetyl-salicylic acid, a drug used to relieve pain, reduce fever, and combat rheumatism, is equally known under its trade name of aspirin. It gives relief in most cases, but in some people it produces gastric acidity. In feverish conditions it induces perspiration, and exposure must then be avoided. Combined with quinine it is useful at the beginning of malaria and influenza, and 5 grains of each might be given for the latter. The same dose would help neuralgia.

Asplenium. *See* Spleenwort.

ASSAULT. In English law an assault is "an attempt or offer with force or violence to do corporal hurt to another." It is thus more than a threat, although it is still an assault if a person attacking another with a stick or other weapon misses his aim. Battery is an aggravated form of assault in which actual injury has been done. The maximum punishment for a common assault is 12 months' imprisonment with or without hard labour. If bodily harm has been done, three years' imprisonment may be given. *See* Separation Order; Summons.

ASSESSMENT. The term assessment is applied to the annual value of land or income in order to ascertain the sum which a man should pay in rates or taxes. Houses and other property are assessed at a figure, known as the rateable value, and on this the rates are calculated. The valuation is made by the assessment committee in each area.

Assessments are revised from time to time. A man who considers his property is assessed at too high a figure should apply to the clerk of the local assessment committee. *See* Income Tax; Rates.

ASSETS. In the case of a deceased person the assets are estimated by a valuation.

Stocks and shares are reckoned at the price they stood at on the market on the day of the death of the deceased. Shares in a company not quoted on any Stock Exchange should be valued by the directors or the secretary. If the deceased had a business, an estimate is made of the machinery, stock-in-trade, etc., and something added for goodwill—from three months' to two years' profits according to the kind of business. But the test is, what price would be paid by a person who wanted to buy a business of that kind. *See* Executor; Will.

ASTER. This name is usually, but incorrectly, given to the popular summer-flowering annual, the China Aster. The real aster is the perennial Michaelmas Daisy (q.v.).

ASTHMA: Self Help for the Patient.

The chief symptoms of asthma, which is a disease of the chest, are attacks of great difficulty in breathing. They often come on suddenly, and may be followed by equally sudden relief. The disease is due to a spasmodic contraction of the smaller branches of the windpipe. Some shock to the nervous system is probably the primary cause.

The circumstances which bring about this nervous activity are numerous. The inhalation of such substances as pollen, horse dandruff, cat or dog hair, the ingestion of some foods, e.g. white of egg, or infection with pus-producing microbes, appear to be responsible in many cases. At other times there is irritation from some condition inside the nose. The disease is often an inheritance from parents who have themselves suffered from it. It affects mainly males, and frequently begins in childhood.

During the attack the patient should be allowed to place himself by an open window and to get into any position which appears to him to minimise his difficulties in breathing. When it can be taken, a mustard emetic (a tablespoonful of mustard in a glass of warm water), by making the patient vomit, sometimes relieves the spasm and terminates the seizure. A cup of strong coffee is useful.

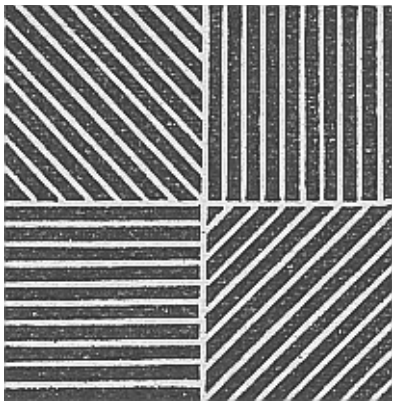
Medicated papers and powders are sold by chemists to be burnt during asthmatic attacks, the resulting fumes having a sedative effect on the excited nerve-endings in the lung. A simple but useful fumigant of this kind can be prepared at home by soaking thick blotting paper in a strong solution of nitrate of potash, and then drying. Bend the dried paper into a cone and set light to one comer, letting the patient inhale the fumes.

It is not desirable, however, that the patient should rest content with a fumigant, a spray or anything else which relieves his paroxysms. The causes underlying these must be investigated, and he can help his physician by carefully observing and making notes of the circumstances which precede the attacks, e.g. the food he eats, or contacts with animals or plants. The

pollen variety is likely to be seasonal. His adviser can help him to fix responsibility on anything suspect by testing solutions of it on scarifications on the skin. If there is a reaction there, he will know what to avoid, or his resistance to such a substance can be raised. Or it may be found that a vaccine does good, or the correction of some intra-nasal condition.

The medicinal remedies most in use are arsenic and the iodides. The patient should live a well-ordered life, with sufficient exercise and plenty of fresh air. His meals, of moderate size, should consist of good, plain food, and the evening meal should be small. He should avail himself of the bracing qualities of baths as cold as he can bear them, followed by a brisk rub down. It is worth repeating that if a man, early in his disease, explores every avenue for escape, there is hope for him; but there is little if he accepts a destiny of invalidism in a drug-impregnated atmosphere.

In children treatment should be under medical supervision.



Astigmatism. Simple test for normal vision. If the sight is correct, all the lines in the diagram should appear equally distinct.

ASTIGMATISM. Abnormality of vision, due to the bulging, transparent portion of the eye (the cornea) not being equally curved in all directions, produces astig- matism. Rays of light striking on the deformed cornea are not accurately reflected on the inner, sensitive part of the eye (the retina), with the result that the vision is inaccurate, It should be corrected by spectacles. *See* Eye; Spectacles.

ASTRAKHAN. The cured and dyed skin of certain lambs used for trimmings on coats and dresses, or coats are made entirely of it. The real skin is imitated by knitted and woven goods, an astrakhan cloth being made with mohair curls on a foundation of threads.

ASTRINGENT. Alum and sulphate of zinc, are examples of drugs which are used as astringents to control bleeding, to reduce the outpouring of fluids from mucous surfaces, and to stop discharges. Other drugs similarly used are tannic acid, perchloride of iron, and lead acetate. Astringent lotions containing benzoin, witch hazel, etc., are used for the face. *See* Beauty Culture; Complexion.

ATHOL BROSE. To make athol brose, mix in a tumbler a wineglassful of whisky with a large teaspoonful of honey, and fill up with milk that has been nearly brought to the boil. A well-beaten egg may be added.

AT HOME. This term is employed for an afternoon party to which formal invitations have been sent out, but occasionally means the periodically fixed At Home day of the hostess. These have decreased in popularity, but where still continued a lady notifies on her visiting cards the day (weekly or fortnightly) on which she will be at home to callers. The usual hours are from four till six, and tea is served in the drawing-room, poured out by the hostess or by a daughter, not by maids. Gentlemen leave their hats and coats in the hall. Ices are not usually served at such At Homes, but there may be a great variety of dainty small cakes, cut cake, paste or cress or cucumber sandwiches; also thin bread and butter and, in winter, small hot buttered scones.

Guests, on arrival at any At Home, do not inquire if the hostess is in. At very large formal parties they may be offered tea at once and taken to the tea-room before going to the drawing-room; but in any case the servant precedes them to the drawing-room and announces them. The hostess stands near the door to receive guests when a number are expected. When dancing, bridge, or a special programme of music are the objects of the party the hours are usually from three o'clock to six, or later, and the guests remain for the whole afternoon; otherwise people come and go as they please, and move about the room to talk to their friends, or go to have tea, when this is served during the party in another room. Only at a small party can the hostess talk to all her guests or introduce them generally. It is unnecessary to take leave of the hostess, unless she is standing near the door, or it is the guest's first visit, when it would be more formal to do so. Guests make their way to the hall, and servants call up cars or taxis, if required. Gratuities are never offered to servants.

For the formal At Home party invitations are sent out a week or two weeks in advance, and acceptances are expected in writing. The card of invitation bears the printed name of the hostess, with At Home underneath then the date of the party beneath that. The address should be in the right-hand bottom corner, and in the left "Bridge," "Music," or whatever form of entertainment is to be provided, and the time. The guest's name is written in ink on the top left-hand corner. An increasingly popular form of At Home is the sherry party. More formal than the cocktail party, which it has to some extent superseded, it is held usually from 6 to 8 p.m. Sometimes dancing is included to enliven the party; and this is stated clearly on the invitation: "Sherry and Dancing, 6 to 8," with the name of the person invited written in the top left-hand corner. Bridge-party clothes, i.e. fairly elaborate afternoon wear, are usual. Women generally keep their hats on. The sherry party is also a good way of celebra-

ting an engagement or "house-warming." "Soft drinks" or gin, for those who prefer them, are often served as well; but the sherry is the important thing. Good sherry (q.v.) is the same price as bad: let your wine-merchant advise you. You are not obliged to buy it by the crate. 4s. 6d. per bottle is a reasonable price. Food at sherry parties nowadays includes Danish delicacies such as Smorrebrod (a kind of large savoury sandwich of which there are many varieties), chipolata sausages, stuffed olives, and cheese-straws, with perhaps some salted almonds and raisins. *See* Cocktail; Dinner Party Etiquette; Reception; Sherry; Wedding.

Atomiser. *See* Spray.

ATROPINE. Atropine or atropia is the active principle of the belladonna plant or deadly nightshade. It is much used in eye diseases, as it dilates the pupil widely.

Both atropine and various preparations of belladonna are dangerous drugs, and should never be used except on a physician's directions. The practice of using drops of a solution of atropine in the eyes to make them lustrous is most dangerous. *See* Belladonna.

ATTACHÉ CASE: Its Renovation. The best attaché cases are made of cowhide, but cases of similar appearance are made with a cardboard foundation covered with thin leather and lined either with leather or cloth. The solid leather case will stand much wear and tear, but the leather-covered varieties are liable to break away at the corners and get out of shape. Cheaper kinds are made of compressed fibre.

The leather covering is kept in good condition by rubbing over occasionally with brown boot polish; fibre covers should be treated with furniture polish. When the sewing at the comer of leather cases gives way or shows signs of wear, a thin leather corner piece may be sewn on; further strength may be given inside by fitting a tin or thin brass corner plate, which is attached by means of bifurcated rivets. To clean an old leather attaché case, use a weak solution of oxalic acid, applied with a rag; polish when dry with a good brown boot polish.

ATTACHMENT. A person can be attached—that is, arrested—by any judge of a court of record if he is guilty of contempt of court. Attachment of debts is the process by which one person can obtain money which is owing to another who in turn owes money to him. For instance, A owes B £100, which B cannot obtain. B, however, knows that C owes A £200, so he can obtain an order of the court by which he attaches £100 of this debt; i.e. C, instead of paying £100 to A, pays it to B. The order by which this is done is called a garnishee.

ATTESTATION. This word is used by lawyers for the act of testifying or witnessing to anything, either by signature or on oath. All wills must be attested by two witnesses, who must be present at the same time, and must sign their names on the document in the presence of the testator and of each other. *See* Will.

ATTIC. If left in an unfinished state by the builder, the attic is not of much use until the walls and ceiling have been plastered and papered; but this is easily done. At the same time it should be ascertained that the roof and window are watertight. The fireplace usually possesses a chimney that smokes in a high wind, so lighting and heating should be carried out, if possible, by gas or electricity.

An attic window sometimes lends itself to picturesque treatment with a window-seat. For an attic bedroom quaint chintz or cretonne may be used for the curtains, window-seat, chair cushions, and bed drapery. If children are to play in the room a large table should be provided, covered with brightly coloured American cloth, the same fabric being used for the curtains, as it can be easily and frequently washed with a damp cloth and soap.

Any odd pieces of furniture may furnish an attic, and if they are shabby they may be scraped and enamelled in some suitable shade. The floor should be stained or painted if good,- or, if not, covered with parquet linoleum and a rug or two. As draughts enter below attic doors, felt weather stripping is often necessary, or a piece of boarding arranged to keep away the draught. A screen adds cosiness.

It is not difficult to convert an attic into a sitting-room. As its window will doubtless be small, the walls should be made light in colour; cream or light grey distemper gives a satisfactory effect, or primrose yellow, or pale green plastic paint for a bad wall surface. A thick coat of the paint is laid on and finely stippled.

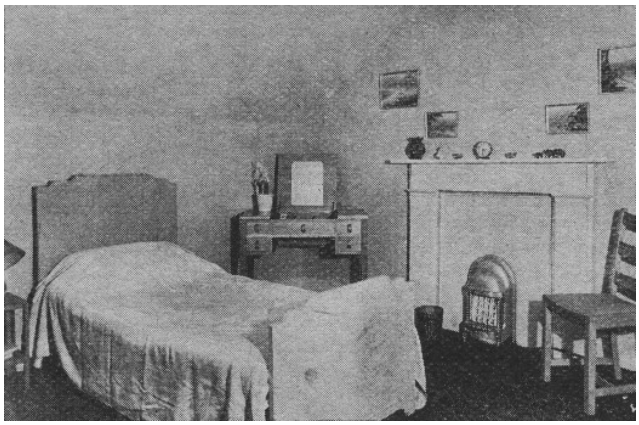
A cheap seat can be made from a wood frame on short legs, adorned with cretonne hangings and provided with a cretonne-covered cushion. Easy chairs which are no longer required for rooms downstairs can be given a new lease of life by means of loose covers of cretonne to match.

Wood shelving, enamelled or stained, will conveniently fill the odd corners. A bureau or tallboy affords a good deal of storage space. The bureau should be placed by the window to enable the writer to see well.

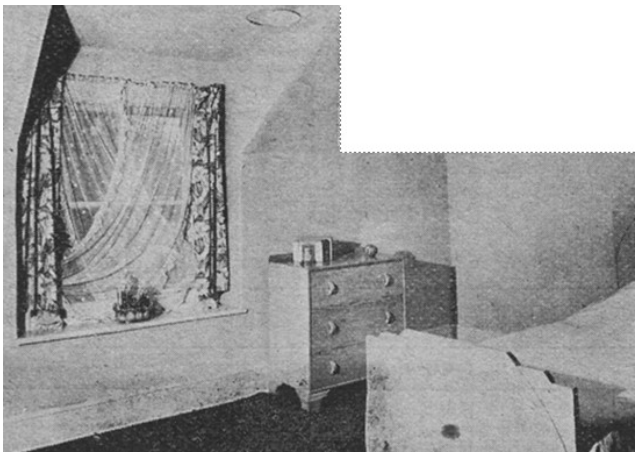
Should the room be disfigured by means of a chimney passing through it, the latter can be encased by bookshelves stained to match the rest of the woodwork. Treated in this way it will be hidden from view.

Many people who convert their attics into sitting-rooms have the walls panelled in such a way that one of the big panels can be lifted out at a moment's notice. When this is done a large cupboard running the entire length of the room is disclosed, and this contains trunks and a collection of other miscellaneous articles usually stored away in a loft. A wardrobe is not recommended

on account of the space it occupies, and because a curtained recess can be fitted up with hooks and stretchers to do equally well.



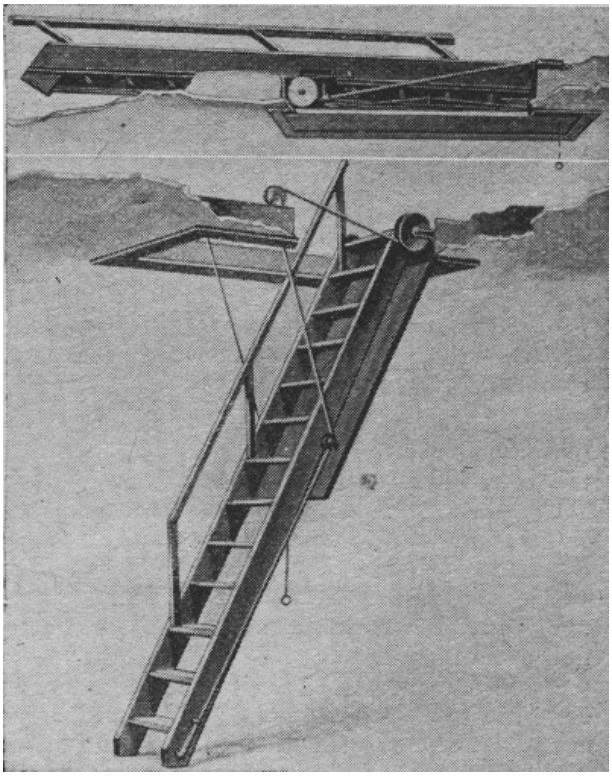
Attic. Two views of an old-fashioned wallpapered attic converted into a comfortable bedroom. The grate is filled in and a gas stove fitted. Furniture is rugged and "dumpy"; electric light is let into the ceiling.(Photos: Lincoln Collins Studio)



In the case of a girl's bed-room, a long mirror can be fastened against the wall. A pedestal desk with a glass top and swing mirror makes an effective dressing-table, while for a washstand a small table with a coloured rush mat behind it will serve. A bedstead without a foot rail gives an attic the appearance of roominess.

A small bedside table, a bookshelf made from a long narrow box and stained to match the rest of the furniture, together with an easy chair, brightly coloured rugs and a harmonizing cretonne will furnish a pretty room.

The storage space provided by an attic or loft is often wasted because there is no ready access to it. Many attics are entered only by a rectangular trap door, and steps or ladders have to be carried up every time there is any reason to go into the attic. The illustration shows a type of disappearing stairway which can readily be brought into use when required. This is made in a wide range of standard sizes, and is sent out ready to be installed by the user. Should it be necessary to do so, the stairway can easily be removed. *See* Bedroom; Chair; Curtains, etc.



Attic. Sliding stairway which is lowered and raised with ease. When out of use (above) it is concealed behind a panel in the ceiling. (Courtesy of H.C. Slingsby)



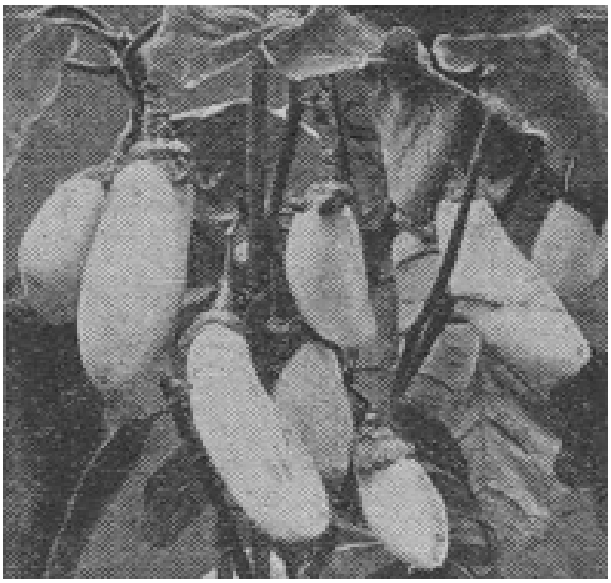
Attic. How it may be transformed into an attractive sitting-room.

ATTORNEY. Power of attorney is the authority which one man gives to another to carry on his business for him. Sometimes power of attorney is only given for a single purpose. Sometimes it is a general power of attorney which enables the holder to do all things which normally require the signature of his principal. The stamp duty is 10s.

ATTORNMENT. The attornment of a tenant to a landlord takes place when the property passes from one owner to another, and the tenant acknowledges the new owner as his landlord. After attornment the tenant is not allowed to deny that his new landlord has

a good title to the property. *See* Mortgage.

AUBERGINE. The seed is sown in a box or pan in late winter or early spring, set singly in small pots, and transferred to larger ones, using good loam with a quarter each of leaf-mould and decayed manure with sand, and giving plenty of water. There are white varieties, but the best cookers are the Early Purple, Long Purple and New York Purple.



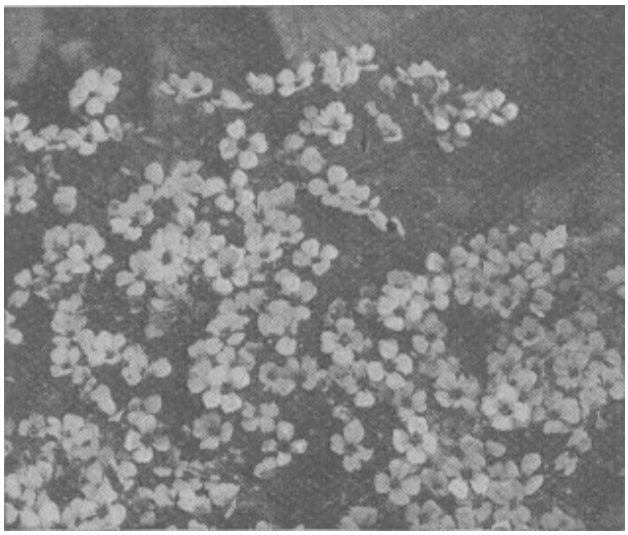
Aubergine in fruit. It has a delicate flavour. (Photo from Country Life, Ltd.)

Baked Aubergines. To prepare these wipe and put in a casserole with a very little water at the bottom. Cover them and bake i n a moderate oven until tender. They can be served in the casserole. In eating cut them open and mash them with a little butter, pepper, and salt.

Fried Aubergines. Take two aubergines, one egg, and a little flour, salt, pepper and breadcrumbs. Remove the peel and cut the aubergines into slices. Soak these in strong brine for about 2 hours, as the plant seems more bitter when fried. Drain them in a cloth, dip in flour previously mixed with salt and pepper, brush over with beaten egg, and coat with breadcrumbs. Fry in hot fat, drain on soft paper, and serve hot. A frying batter may be used instead of egg and crumbs. Pron. O-ber-zheen'

AUBRIETIA. Coming into bloom before spring is far advanced, the purple rock cress or Aubrietia is generally at its best in April or May, but loses brilliance in summer, and after being cut back soon begins to grow again. On the rockery these plants form cascades of colour, while in beds they are a ground work for tulips. They are propagated by seed sown in spring, preferably under glass. The seedlings should be pricked out in a spare bed for the summer, and planted where they are to flower in autumn.

Only one species is in general cultivation. This is



Aubrietia. Clump of this quick-spreading, brightly coloured plant which thrives in rock gardens. (Photo from Sutton & Sons, Ltd.)

deltoidea, with purple flowers. Modern varieties of it include Bougainvillea, Fire King, Royal Purple, Dr. Mules, Lavender, H. Marshall, Leitchtlinii, J. S. Baker, Pritchard's A1, Violacea, Moerheimi, Lloyd Edwards, Excelsa, and Violet Queen. Pron. O-bree'-sha.

Auction Bridge. *See* Bridge.

AUCTIONS AND AUCTIONEERS.

In most cases people prefer to do their own bidding at auction sales, but a broker may be employed at a small commission to bid up to a certain figure for any articles desired, and his services are useful in a crowded sale-room. He is also useful in arranging for the removal of purchases the day after the sale—a matter of expense which must not be overlooked in determining limits of prices to be bid.

There are special sales in various places, and on the premises of certain celebrated firms where the word antique in the catalogue is a genuine guarantee; but in the mixed sale of furniture and effects antique is used indiscriminately to describe anything not in the style of the last thirty years.

For the casual buyer, cash payments are the rule—a deposit being paid to the clerk for each article as it is knocked down, and the remainder before the goods are removed. After one or two visits resulting in business a client's cheque will be accepted at the conclusion of the sale for the amount owing.

For the vendor also there is opportunity in the auction sale. Instead of bargaining with a private buyer, the haggling is done by the bidders, and there is the possibility of a price being obtained in excess of expectation. In selling a houseful of furniture and effects, it is well to consider the question of a sale on the premises, placing the business in the hands of a good firm of local auctioneers. The usual commission charged on each article is 10 p.c. of the sum realized.

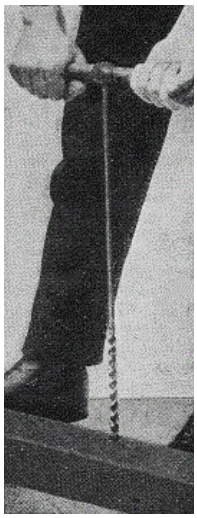
A reserve price should be put on valuable pieces.

The vendor is then responsible to the auctioneer for a commission on the highest figure bid, should it fall short of the reserve and result in no sale—but such commission is usually only *2½* p.c., with a minimum of 2s. 6d.

Good furniture and effects which have intrinsic or fashionable value are best sent to sale-rooms which attract a large number of well-to-do buyers, where sales are held once or twice a week regularly, and goods received to be catalogued four or five days before the sale. Sotheby's is a recognized mart for rare books, and Christie's for valuable china. Advice and valuation can be obtained from an expert for a small charge.

Legal Aspects. From a legal point of view the auction is an offer of property to the highest bidder. It follows (1) that the owner of the property cannot bid himself, so as to run up the price. If he does so, the buyer can cancel the sale, return the property and demand his money back; (2) that unless it is duly advertised, or stated by the auctioneer, there can be no reserve price. The only exception to (1) is that in the case of a sale of landed property the owner may employ one person to bid for him. The sale is complete on the fall of the hammer.

Although a sale of goods, etc., may be advertised without reserve for a certain day, the owner is not obliged to put them up on that day or at all. He may sell by private treaty beforehand, or withdraw the property from the auction. This will not deprive the auctioneer of his right to be paid. The auctioneer need not accept a bid; but once he has accepted it he is bound to knock the property down to that bidder unless there is a higher bid. If two persons simultaneously bid the same amount, the auctioneer can accept which of the bids he pleases. An auctioneer is not entitled to sell except for cash. Those who bid at an auction should read the conditions of sale carefully. Anyone entering into a "knock-out," i.e. an agreement among dealers not to bid against one another, is liable to a fine of £100 or 6 months imprisonment or both.

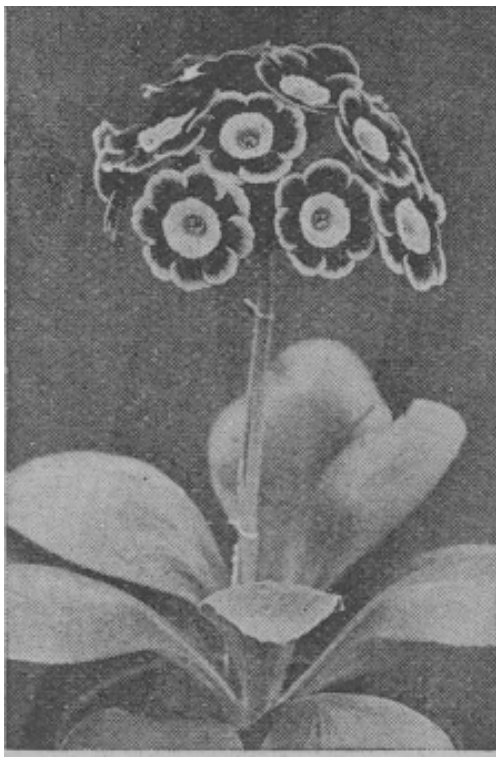


Auger. Correct manner of holding the tool.

AUGER. This tool is used for boring holes to a greater depth than is practicable with brace and bit, especially in hard wood. It consists of a steel shank terminating in a twisted cutting-bit, the wooden handle passing through the eye of the shank. Augers may be obtained in sizes from ⅜ in. up to 1½ in. In using this tool it is essential to keep the shank in a true vertical position while cutting, watching it from two different angles. *See* Boring.

AU GRATIN. A dish served au gratin is one covered with sauce and grated cheese or breadcrumbs, and brought to the table in the dish in which it is cooked. Fish and vegetables are frequently prepared in this way. *See* Cauliflower; Egg; Macaroni; Sole, etc.

AURICULA. Hardy and half hardy perennial, easily raised from seed. The indoor or show varieties are always grown under glass. The soil should be good loam with some root fibre in it, about a third part of leaf-mould, some decayed hotbed manure, and a little sand for drainage.



Auricula. Fine specimen of the plant allied to the primrose.(Reginald T. Malby)

Potting is generally done in spring, soon after the flowering is over, and the plants kept in a frame facing north throughout the summer, but they are given a south exposure after the end of October. Towards the end of winter gentle heat may be given, but no attempt must be made to force. Water carefully as growth proceeds, and the reward will be a crop of exquisite blooms in March. A small brown grub often causes trouble, and this must be watched for and destroyed.

Propagation is by division after the flowering period, each of the crowns making a new plant.

For outdoor cultivation seedlings are generally sold under the name of border auriculas, but a beautiful yellow strain is to be obtained separately. Border auriculas require to be sown in cold frames in February and planted out in a semi-shaded nursery bed in June if they are to make good plants for bedding out in autumn.

Border auriculas are charming in clumps along the front of herbaceous borders, and also in beds, where they may be associated with hardy primulas in spring.

AUGUST

What to do in the Garden

Flowers

Sow mignonette

Take layers of carnations.

Take cuttings of geraniums, antirrhinums, pansies, pentstemons, and violas, and put in cold frames

Pot up Roman hyacinths for Christmas flowering

Pinch off all seed pods from sweet peas

Fumigate greenhouse, and syringe plants during hot weather

Bud roses

Fruit

Gather early apples, and summer-prune old-established apples and pears

Finish budding as early in month as possible

Keep roots of cherry-trees well moistened

Gather peaches before full heat of sun

Cut out old wood from black currants

Re-pot young strawberries rooted from runners in July

Vegetables

Break leaves over tops of cauliflowers when hearts are developed

Earth up celery

Sow cauliflower seed in frames, also sow pickling cabbage

Sow winter onions, and tread soil down firmly beforehand. Sow turnips for winter use. Put in last sowing of radish seed

Cut herbs for drying, and hang them upside down, in a cool place

Food in Season

Fish

Bass; bream; brill; dory; eels; flounder; haddock; hake; halibut; mullet; plaice; perch; pike; salmon; shad; sole; tench; trout; turbot; whitebait; whiting

Shellfish

Crabs; crayfish; lobsters; prawns; shrimps

Meat

Beef; lamb; mutton; veal

Poultry and Game

Chickens; ducklings; ducks; fowls; geese; goslings; pigeons; turkey poults; black-game; capercailzie; grouse; hares; plover; rabbits; venison; woodcock

Vegetables

Cresses; cucumbers; lettuce; radishes; endive; celery; mushrooms; onions; tomatoes; watercress; artichokes: aubergine; beans; beetroots; Brussels sprouts; cabbage; carrots; cauliflower; leeks; marrows; peas; potatoes; spinach; turnips

Fruit

Apples; apricots; bananas; cherries; damsons; grapes; greengages; melons; medlars; nectarines; nuts; oranges; peaches; pears; pineapples; plums; quinces

Notes for the Month

AUGUST 1.—Lammas, quarter day in Scotland
AUGUST 4.—Great Britain declared war on Germany, 1914
AUGUST 5.—Oyster season opens
AUGUST 11.—Half quarter day
AUGUST 12.—Grouse shooting begins
The first Monday in August is a bank holiday in England and Wales

The plants may be lifted from the beds or borders towards the end of May, and planted in a reserve bed, preferably in a rather shady place. Pron. Or-rik'-u-la.

AUTUMN: In the Garden. Strictly speaking, the autumn season extends from September 21 to December 21, but popularly it is regarded as covering the three months of September, October and November.

Apart from the routine work of each month, autumn is the proper time to take in hand the lay-out of a new garden, or to make any alterations required. Rough turf should be dug up, piled and systematically fired from time to time to destroy weed seeds. Afterwards the residue may be spread upon the ground to await further cleansing and disintegration by winter frosts.

Hardy spring flowering bulbs, crocuses, snowdrops, and daffodils, may be planted at any time during the autumn, though daffodils yield the best results when planted in September. April tulips should be planted during the month of October, whatever the existing climatic conditions, to obtain the best results. May flowering tulips are planted early in November.

In the gardens of the protected southern and western districts of the country the autumn is the time for planting roses and fruit trees. In the northern and eastern parts of Britain planting is better deferred until the spring, unless it can be completed by the end of November.

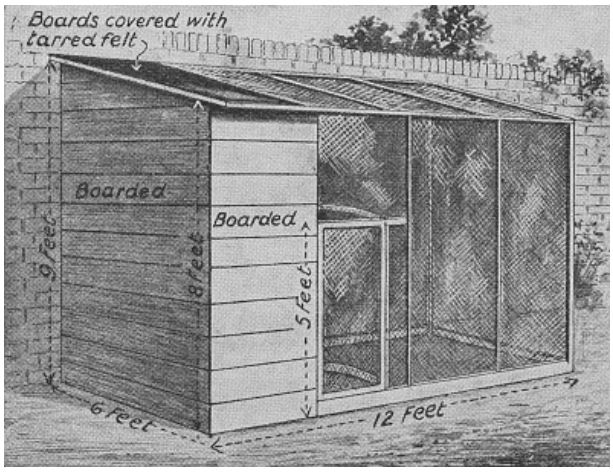
The greenhouse needs careful management in the autumn. An important detail is to close the ventilators early in the afternoon; this has the effect of maintaining the required temperature without the aid of much fire heat. Watering should be done in the morning so that the atmosphere may be dry by even-ing. *See* Gardening; September; October; November.

AVIARY. As generally understood this is an outdoor cage for captive birds, sufficiently large to permit the birds inside to fly. One portion should have close walls and roof, and be fitted with nesting boxes and natural branches for perching, the remaining portion (say three-fourths) being left open save for wire-netting of small mesh. This portion should be furnished with growing shrubs in tubs, drinking water, bath, etc.

For the construction of an aviary, the chief materials required are 2 in. deal quartering, feather boards and wire-netting. If possible, it should be built against a wall, and should face S. or S.W. Supposing the length decided upon to be 12 ft., the height 8 ft. and the depth from back to front 6 ft., the quartering for the framework would be three lengths of 12 ft., three of 9 ft., five of 8 ft. 4 in., and nine of 6 ft. ; the 8 ft. 4 in. to have their lower ends tarred for 6 in., of which 4 in. will be inserted in the ground.

The 9 ft. uprights having been fastened to the wall at equal distances apart, a 12 ft. horizontal is attached to their tops, a simple joint being made by cutting half through the wood, so that they interlock. The remaining two 12 ft. lengths and the five 8 ft. 4 in. lengths are joined up in similar fashion to make the frame of the front, which is then connected with the back by means of the 6 ft. lengths, as shown in the diagram. The side, front and roof of the eastern fourth are boarded in and tarred on the outside, roofing felt being added here.

The remainder of the structure is then covered with wire-netting. A small door should be contrived, hinged on an upright and opening inwards to a sort of wire "lock" to prevent birds escaping as anyone enters the aviary. In selecting tenants, the seed-eating woodland and hedgerow birds will be found the most suitable. The tits, which are mainly insect eaters, may be included, and meaty bones, suet, and coconut substituted for insect food. *See* Bird Cage; Canary.



Aviary for hardy birds, built against a garden wall. It is constructed with a boarded shelter to protect the inmates from the weather.

AVOIRDUPOIS WEIGHT. By far the most used of English weights is avoirdupois, food and materials being usually sold by it. It is as follows:

16 Drams = 1 Ounce (oz.)
16 Ounces = 1 Pound (lb.)
14 Pounds = 1 Stone
28 Pounds = 1 Quarter
112 Pounds = 1 Hundredweight (cwt.)
20 Hundredweights = 1 Ton

In the case of certain articles the stone is less than 14 lb.

AWL. A fine-pointed tool, the awl is used by bootmakers, saddlers, cobblers, and all leather workers for making holes to receive the thread when handstitching is being done. Its blade is not edged but pointed. *See* Boot Repairing; Bradawl.

AWNING. The fittings of window awnings must be strong and well made, so that they may be drawn in and out with ease. Where a large French window opens on to a garden a wide awning, the full width of the window, fitted in the same way as the ordinary awning

used for shop windows, adds to the amenities of a small house in summer.

Awnings for the garden range from the giant sun umbrella and the simplest awning spread over four uprights to what becomes virtually a summer-house. The favourite material for making these is striped cloth in red and white or green and white.

Awnings should not be exposed to dew and rain without being properly dried. Before they are put away for the winter they should always be well laundered so as to keep the material in sound condition. *See* Tent; Waterproofing.

AXE. This tool for cutting wood a n d felling timber consists of a weighty head with sharp cutting edge, the helve or handle being of varying length according to the work required. It is employed with a wide swinging stroke, at the beginning of which the right hand is just under the head, the left at the other end of the helve. During the swing the right hand slips down the handle, until, as the axe is brought down, both hands are together. For lopping light branches a blow is given on the under-side of the branch.



Axe. How to hold to obtain the correct swing in felling a tree.

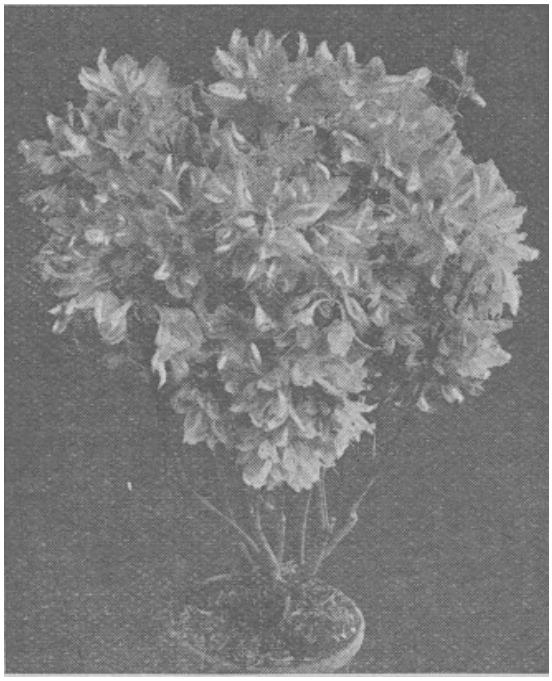
For felling trunks the axe is wielded first in a downward sloping direction, then in an upward direction, to take out a V-shaped chip; the V is then gradually increased to the centre of the trunk. A notch is then commenced on the other side, and continued to meet the first V in the centre, when the tree falls away from the cutter.

If the edge of an axe is rubbed occasionally with a carborundum, the tool will require less frequent grinding. The wedge that secures the head is made of some hard wood. If a new wedge is needed, cut one longer than the depth of the cut in the handle, and sufficiently wide. Hammer it in as far as it will go, and then saw it off level with the axe head. *See* Chopper; Hatchet.

Axle. *See* Front Axle; Live Axle; Motor Car.

AXMINSTER CARPET. A tufted, machine-made fabric, the pattern being formed by tufts of woollen yarn, cut off and inserted in the body of the carpet. It is made in different qualities and in two kinds, seamless squares and in breadths. *See* Carpet.

AZALEA. These flowering shrubs, now classified as rhododendron by the botanist, consist of several species and numerous varieties of three types:—the Indian azalea (rhododendron indicum), the Ghent, and the mollis azaleas. The Indian azalea, largely imported from Holland, is grown chiefly under glass for spring blooming. The Ghent and mollis azaleas are used similarly and also as hardy summer-flowering shrubs; the flowers are brilliantly coloured—orange, apricot, salmon, rose, etc. They thrive best in soil mixed with peat or leaf mould. The correct potting compost for Indian azaleas is peat and loam with sand added freely.



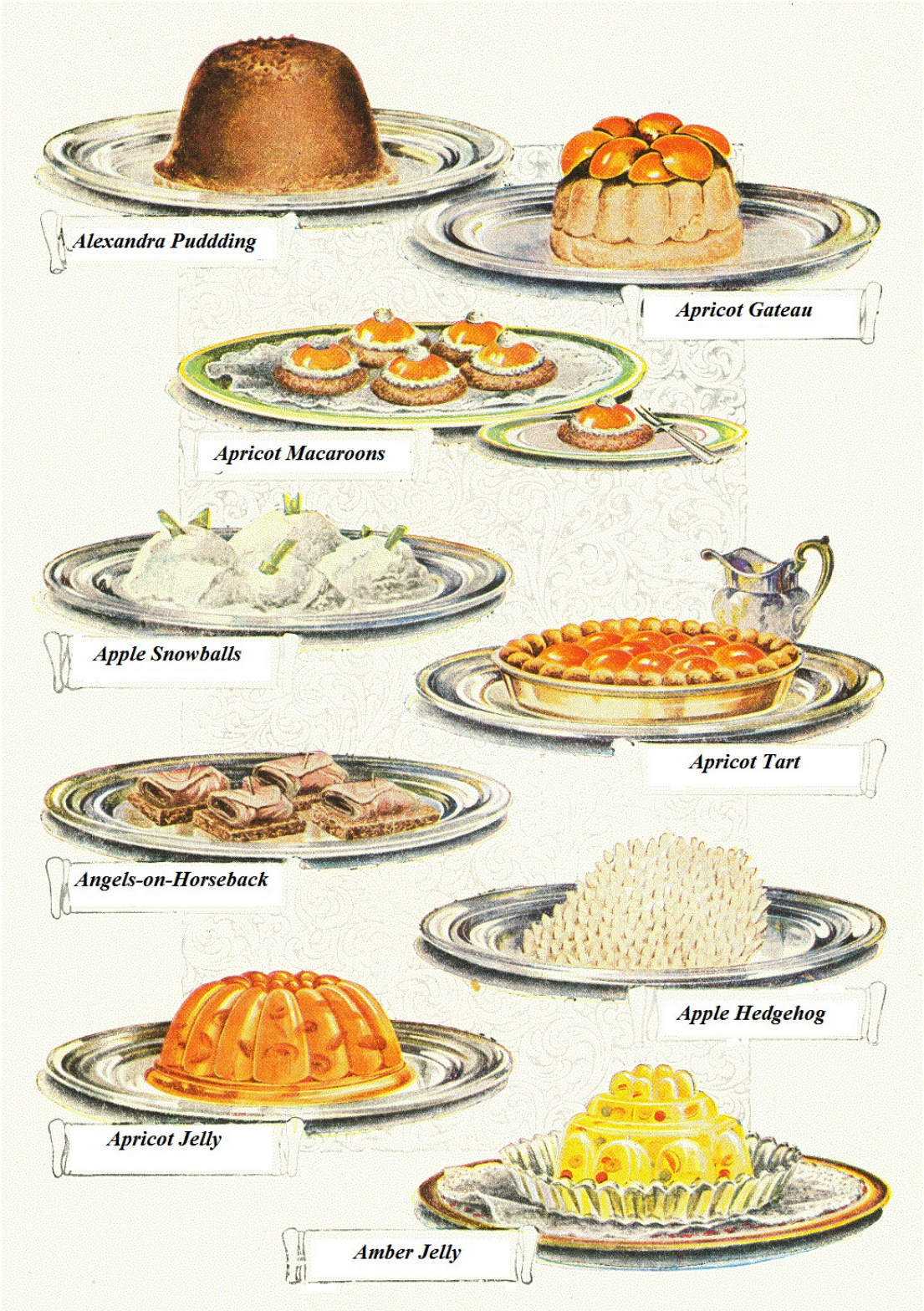
Azalea. Luxuriant bloom of a potted plant. (Courtesy of Sutton & Sons).

When the plants are potted, room should be left for adequate watering, as many failures occur because of dryness at the root. Periodical syringing of the foliage before the plant comes into bloom is also beneficial, and as the buds swell an occasional top-dressing of manure should be given. After flowering the plants should be stood out of doors for the summer on a bed of ashes. Repot immediately after the flowers have faded.

To propagate azaleas, cuttings are taken when the plants are making new growth. Young but sturdy shoots should be chosen, and they will root better if they are pulled off the stem, so that they retain a heel of the old wood.

Good varieties of Azalea Indica: Deutsche Perle (white), Fielder's White (white, large flowers), Alice (deep rose, double), Bernard André (violet purple, double), Souvenir de Prince Albert (rosy salmon with white edge), Criterion (salmon pink), John Gould Veitch (lilac rose), Madame van Houtte (carmine and rose, flaked), and Vervaeneana alba (white).

(Continued in page 95)



'A' RECIPES: A SELECTION SHOWN IN ACTUAL COLOURS

Alexandra Pudding, made of 6 oz. bread cut into cubes and soaked in 2 eggs beaten up with ¾ pt. milk. Add 3 oz. currants, 2 oz. sultanas and 2 oz. chopped candied peel; grated rind of 1 lemon, 3oz. sugar. Colour with browning. Put in greased basin and steam for 1½ hr. Apple Hedgehog, i.e. baked apples with almonds, covered with icing sugar and browned in oven. Amber Jelly: Follow general directions for Jelly and add a little sherry, lemon-juice, two eggs and pieces of any fruit desired.

BABY: THE FIRST YEAR OF LIFE

Practical Advice for the Young Mother

For infant care from the second year onwards, *see* Child; other information is given under Baby Chair; Cot; Perambulator; etc.

Mother ignorance is responsible for a fair proportion of the children we lose before their first birthday. Unhealthy motherhood accounts for many of these deaths, so that the first duty of every expectant mother is to care for her own health. The ante-natal period of life is also very important to the health of the baby. That is why ante-natal clinics have been organized so that mothers may attend during pregnancy to receive medical advice.

The expectant mother should always see a doctor three or four times before the baby is born, and before the first baby's birth this is especially necessary, as certain simple measurements have to be made in order to know that the young mother is capable of bearing a fulltime child of average size.

The term "hygiene of pregnancy" includes proper diet and exercise for mothers during the months before the baby is born, and the provision of fresh air, rest and healthy sleep. The expectant mother ought not to overfeed. Indiscretions in diet cause the dyspepsia with heart-burn which makes so many mothers miserable at this time. Light, nourishing food, with flesh meat served certainly not more than once a day, must be the rule.

Eggs, cheese dishes, and fish can take the place of meat at two of the three substantial meals, and, in addition to these, a cup of tea with biscuits or bread-and-butter at 4.30 p.m. If an evening meal is not served later than 7 p.m., a glass of milk at bed-time is permissible. During the last month some doctors advise that no flesh meat should be taken at all. Plenty of fruit and vegetables should be eaten, and as much of them be taken uncooked as possible.

The breasts require a little special attention, in order to prevent cracked nipples, which interfere with natural feeding. The nipples should be washed daily with warm water, carefully dried, and hardened by gentle friction. If the nipples are small, they should be rolled between an oiled finger and thumb to develop them. Clothing should be light and loose, without any constriction of the body, and supported from the shoulders. Special maternity corsets or belt may be worn if desired. Garters must be discarded and suspenders used instead. High-heeled shoes should be avoided; they are apt to cause loss of balance when walking during pregnancy.

Expectant Mother Must Take Exercise

Regular exercise and a certain amount of work are far better for the health than the sort of sofa existence some women think justifiable at this time. The expectant mother can do light housework, even light gardening. She can carry on her business or profession for several months at least, providing her work is not physically or mentally exhausting. A brief rest of 20 minutes after luncheon and also before the evening meal is excellent. Every effort should be made to obtain restful sleep by regular bedtime, a well-aired room, a comfortable bed and a tranquil mind. It is usually necessary to cultivate a restful outlook, and not to be emotional or to exaggerate trifling grievances.

Indigestion and constipation are perhaps the commonest ailments at this time. The only medicine which should be taken without a doctor's prescription is a tumbler of hot water, with a pinch of bicarbonate of soda added, ½ to ¾ of an hour before meals.

For constipation take plenty of water and raw fruit between meals, regular exercise, and a tablespoonful of liquid paraffin once or twice daily. If these simple measures are not successful consult a doctor without delay. Morning sickness is not so much a digestive disorder as a symptom caused by chemical changes in the body at this time; it usually passes off at the end of the third month.

Varicose veins are often quite painful in pregnancy. When they appear it is necessary to wear a crêpe velpean bandage, and this must be applied round the instep first (not the ankle, or the feet may swell) and then upwards to the knee. Rest is *most,* important. When resting, keep the feet up on a couch or stool, and do not stand more than is strictly necessary. The teeth should be watched stoppings attended to and decayed teeth removed before baby is born. Bad teeth, by infecting the milk, will jeopardise the child's health and development.

Feeding the New-Born Baby

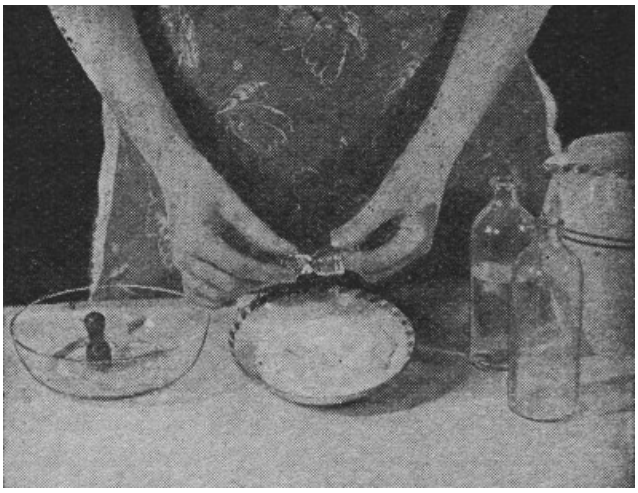
The average normal child weighs from 7 to 7½ lb. at birth. Mother's own milk is baby's right and natural food. In almost every case it is possible for a mother to feed her child herself. Nevertheless quite a common mistake is lack of patience because the breast milk does not seem to satisfy the baby, and artificial feeding is resorted to to help the breasts. Test-weighing will show whether or not there is need to complement the breast milk. Sometimes all that is needed is a little sweetened water after the breast-feed. Keep baby a little hungry, otherwise he has not an incentive to suck strenuously, and the milk is apt to go.

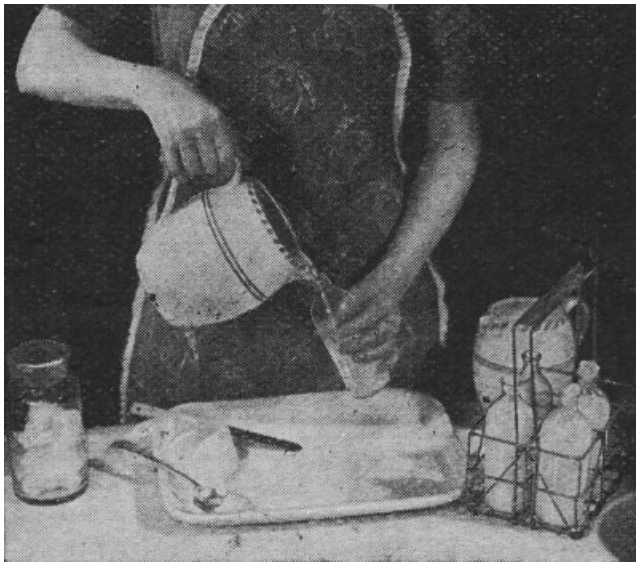
During the first two days he should be fed every six hours; on the third day at four-hourly intervals, and after that every four hours, or every three hours in the case of a weakly or premature baby. No night feeds are given to the modern baby from birth, unless to a premature or very weakly child.

When the milk is insufficient, the baby should not be weaned, but the natural food is supplemented by giving a feed immediately after the breast of diluted and modified fresh cow's or dried milk. Give both breasts at each feed, so that each is regularly stimulated.

When baby cannot be breast fed through abscesses of the breast or other serious cause, then the child must be brought up on the bottle. His chances of health and even of survival are diminished by bottle-feeding. It is

the duty of every woman to nurse her own child unless advised not to do so by the physician for serious health reasons. Breast milk is free from germs; it is most easily digested, and it is of the right temperature.





Baby. Above: cleanse the teats by rubbing them inside and outside with kitchen salt. This will remove milk slime. Below: whole day's supply of modified fresh cow's milk mixture can be made in the morning, bottled and stoppered with sterilized cotton-wool. Stand the bottles in cold water and keep them in a cool place.

To improve the quantity of the mother's milk, she should take extra water to drink between meals. To improve the quality she should see to her health. See that she has more rest-—two hours' rest in bed every afternoon may make all the difference—and teach her to douche and massage the breasts. This is done as follows:

Get a basin of hot water and a basin of cold water and put a piece of Turkish towelling in each. Bathe the breasts alternately with hot and cold water for 10 minutes once or, better still, twice daily. Dry and massage for 10 minutes. With proper care, 90 per cent, of women can nurse their babies.

When bottle feeding has to be resorted to, use the best quality cow's milk which can be modified so that the sugar fat and protein content approximates to that of human milk. Dried milk can be modified in the same way. The vitamin destroyed by boiling the former or in the preparation of the latter can be replaced by orange juice. Give half a teaspoonful of orange juice after the first two months in the same amount of cool boiled water and work up to three teaspoonfuls at six months and six teaspoonfuls at one year.

The following table shows the percentage in human milk and cow's milk:

	Sugar	*Fat*	*Protein*
Human milk	**7%**	**3-5%**	**1-3%**
Cow's milk	**5%**	**3-5%**	**3-3%**

To reduce the protein content, dilute with boiled water. As this reduces also the sugar and fat contents these must be made up.

The proportion for an average baby of 3 to 10 months are as follows: To make 5 oz. of food take 2½ oz. of cow's milk, 1 teaspoonful of sugar, 2½ oz. of water and ¼ oz. of lime water. 1 teaspoonful of emulsion of cod liver oil is given to make up the fat content. A younger baby would need more dilution, an older less.

To Prepare: Stir milk before measuring off desired quantity. Bring milk with sugar quickly to the boil in clean open saucepan. Add lime water and cold boiled water and strain.

Make the food once in 24 hours, and always stir the mixture before measuring off into the feeding bottle. Before giving to baby stand bottle containing milk in hot water to warm to 100° Fahrenheit. Cover bottle with flannel bag to maintain temperature during feed.

This table may be taken as a guide to the quantities required, although it must be modified as required:

	Total in 24 hours.
1st week	**5 - 15 oz.**
2nd „ .	**15 - 20 „**
2nd month	**25 „**
3rd	**27½ „**
4th	**30 „**
5th	**32½ „**
6th	**35 „**
7th	**37½ „**
8th	**40 „**
9th	**40 „**

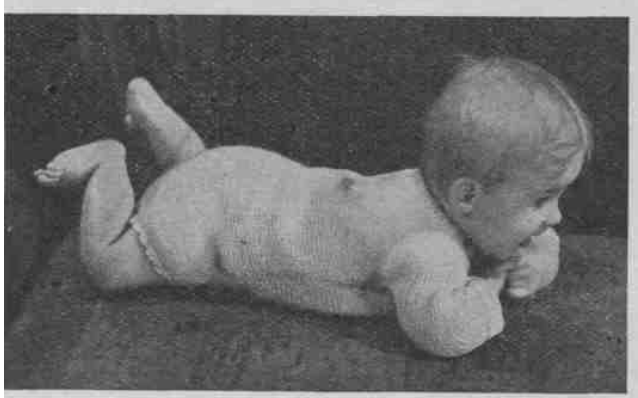
The most careful attention should be given to the bottles. The upright type of bottle *without* valve is recommended *(see* above). Wash in cold water and then in hot water after use, and keep dry, standing on a saucer underneath a cup or mug.

The bottles should be boiled before using again, a special saucepan being kept for this purpose. Place the bottles in cold water, boil for five minutes and cool before the bottles are removed.

Turn teats inside out, rub well with dry salt inside and then out. Scald teats once a day, *never boil*.











Much fretting is saved by correct attention to warmth and skin-comfort. Three photographs, left, show some simple garments. Top: stretchable long-sleeved vest, rib-knitted in soft silk-and-wool mixture. Next: warm, long-legged bootees to protect knees from chilling. Bottom: a romper for the time when baby begins to crawl, particularly useful if he has sunbaths. For ordinary bathing, the right-hand photos show what to do. Above: soap baby all over with your hands before putting him into the bath. Below: hold his head over the bath and wash gently with soft cloth or cotton-wool

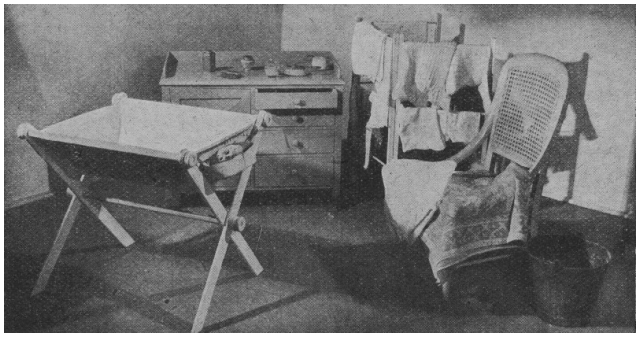






Final stages in baby's toilet. Left: lower him gently into bath, supporting spine and holding feet. Centre: let him splash freely, but always support his back. Right: after drying and powdering, give his hair a leisurely brushing

BABY: CLOTHES AND CLEANLINESS IN HIS FIRST YEAR



Baby. A cosy corner for baby's bath-time. Note the folding rubber bath, low nursing chair, clothes horse, and all other necessaries close at hand. Pour in cool water first, then add warm.

Clothing and Bathing. Whilst the diet is obviously the most important factor during the first year, attention must also be given to daily regimen and to clothing. No binder is needed after the cord has healed at about five or six days, the vest being pinned down on to the napkin to protect the abdomen. The clothing should consist of silk-and-wool vest, a soft napkin of muslin and another of Turkish towelling, petticoat of loosely woven flannel or Viyella, dress of soft all-wool material and a knitted matinee jacket in cold weather. Also a shawl when he is being nursed. The dress and petticoat should reach only a few inches below the feet. Nothing longer than 23-24 inches, which should be the length of the nightgowns.

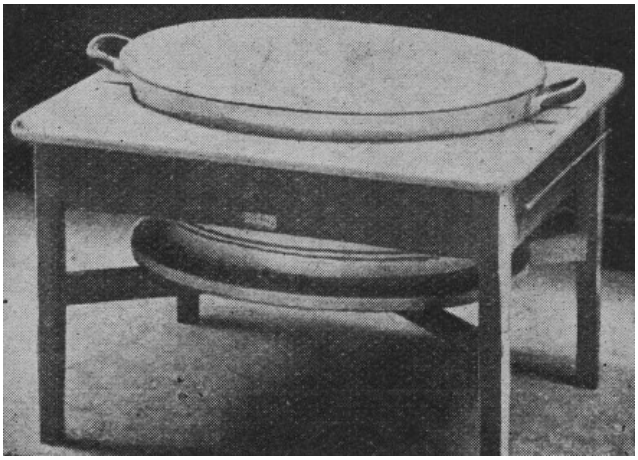
It is often forgotten that babies need their own pocket handkerchiefs, particularly soft and small ones.

The baby should be bathed in the morning and sponged at bedtime. The bath may be enamel, papier maché, rubber or tin. If it has not a stand it must be stood on two chairs at bathing time so as to escape draughts from the floor.

A face cloth and a buttock cloth, a piece of pure soap, and a soft Turkish towel and one of old diaper for the face complete the requisites for the bath, together with a good baby powder. At first the temperature of the bath should be blood heat, 98° to 100° F., and the water is gradually made less warm until it is about 80° F., at six months or so. The bath water should be tested by a thermometer. Thorough removal of soap and careful drying, especially where two surfaces of the skin are in contact.

After the bath the baby has a feed and is put to sleep. He should sleep in his own cot from the beginning, as it is both unsafe and unhygienic to sleep with mother or nurse. He should lie on a firm mattress of hair and wool mixture with overlay of chaff, and bed and bed-clothing should be thoroughly aired daily in a current of fresh air, except, of course, on damp or wet days. It need not be emphasised that a child must live and sleep in fresh air every day of his life. The night air is just as healthy as the day-time air, and the only time that windows should be dosed, for a healthy baby, is in foggy weather.

Weights. A baby should be weighed once a week, a regular gain being the best indication of progress. A few days' sickness or unsuitable food will immediately affect the weight. After baby regains his birth weight, which is usual at the end of the second week, there should be a gain of from 4-8 oz. a week until the 4th month, the birth weight being doubled between the 5th and 6th months. At six months the average weight is 15½ lb., the weekly gain being 4 oz. At one year the average weight is 20-21 lb.



Baby. Enamel bath which fits into a stand at a convenient height for bathing the infant.

Teething. Teething and weaning are the two milestones of the first year. He begins to cut teeth in the sixth month, although they have, of course, been in the gums since birth, their formation beginning about the 16th week of pregnancy. The cutting of the teeth is a physiological process and ought not to be attended by any adverse signs or symptoms. There is an increased flow of saliva (dribbling) and some heat and tenderness in the gums, but he should not otherwise be sick or sorry. Give him something cool and hard to bite on with frequent sips of water, and see that the bowels are acting well, and he should have no trouble with teething. The comforter or dummy teat does not find its way into any properly conducted nursery.

The first teeth are the lower central incisors, or the biting teeth, which should appear about six months, the upper central incisors in the ninth month, and the lateral incisors a month later, i.e. at nine months, which is the time to begin weaning baby. At the end of the first year the first molars are cut; the remaining teeth belong to the second stage of child life.

Weaning from breast or bottle should be completed at ten to eleven months.

From four to eight months, start baby with fruit and vegetable juices and purees. His taste for these will thus be trained before starch, which is not given as early nowadays as formerly.

At eight months give rusks or baked crusts before three of the feeds.

At nine months continue with rusks and introduce a little barley or oat jelly.

At ten months give, at one meal, soup or vegetable puree or egg (not more than three times a week) or gravies.

At eleven months introduce also milk pudding (sieved) and grated or pulped fruits.

After the first birthday the child's meals can be adjusted to those of the household.

Napkins are essential for a baby's comfort. Fewer than two dozen will mean that they will never be properly washed, boiled and aired, and three dozen is the number recommended. The most useful size is 22 in. square after the hems have been turned. Suitable material is butter muslin (made of four thicknesses stitched together) or old soft sheeting (torn into squares and neatly hemmed) for the napkin going next to the skin, and Turkish towelling for the outer napkin.

Never allow a baby's legs to be cramped and deformed by the bulk of the napkins he wears. The better way is to draw one only between the legs folded in a triangle, and over that a second square of Turkish towelling folded round like a pad. Some woolly jackets and a warm shawl complete the necessities of the infant's wardrobe.

Baby is better without a pillow. If one is used, it should be of chaff. As well as the mattress and overlay of chaff, an underblanket, rubber draw sheet, flannel draw sheet, enveloping blanket (70" x 44"), pair of small blankets (36" x 27"), and porous coverlet of cellular material will be needed.

It is handy to have a special basket to hold his immediate requirements, and there are varieties to suit most purses. In the basket the expectant mother should place in readiness the following articles:

Linen thread; one box or string of safety pins; one tin of starch, zinc, and boracic powder; one cake of super-fatted soap; one small tube of vaseline; a case containing needles and white cotton, for stitching the first binders; thimble and sharp square-pointed scissors; a packet of white absorbent cottonwool; a small bottle of pure olive oil; a soft hairbrush; screw top jar for cotton-wool swabs, and small enamel chamber.

Elaborate robes of any kind are not to be encouraged, but prettier day gowns are easily managed by the addition of a little fine lace or embroidery. Babies are rarely dressed in long robes nowadays. Deep embroidery flouncing makes a dainty gown for any baby. There is a Shetland wool which is ideal for making a baby's shawl. It is light in weight, easy to wash and wears well.



Baby. Hamper basket in wicker with a tray in which to keep the toilet requisites. (Treasure Cot Co., Ltd.)

The following list summarises a baby's accessories:

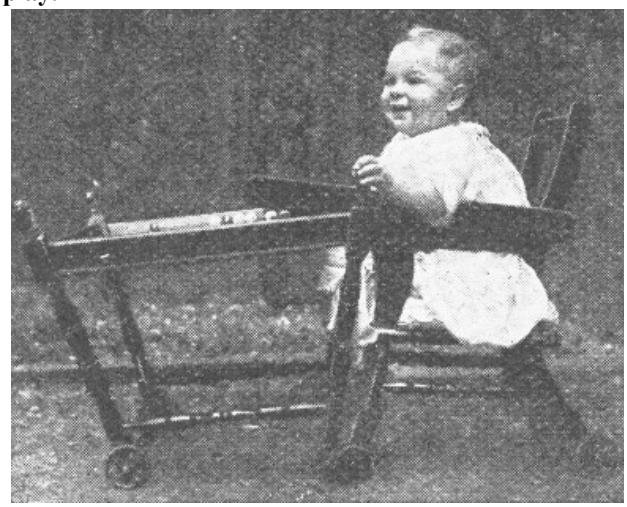
Four long-sleeve vests (silk and wool); four petticoats (loosely woven flannel or Viyella); four frocks (soft all-wool material; four nightgowns (flannel); three knitted coatees; four pairs bootees; large shawl; two small shawls; six bibs; 2 doz. soft napkins; 2 doz. Turkish towelling napkins; ½ doz. small handkerchiefs; crêpe bandage, 2½ - to 3 ins. wide.

There are various types of fitted baskets. A hamper basket is made of strong wicker or cane with side handles, the lid fastening with a rod which runs through cane loops and can be padlocked if necessary. It frequently has fitted castors, which run easily over the floor. On removing the tray, there is a deep recess for the baby's clothes. It can be lined and trimmed to suit the colour scheme chosen for the cot curtains and any other decorations in the night nursery.

The tray has a pincushion attached, and two pockets for brush and comb and powder-box. Clean clothes can be kept in the lower part of the basket; those actually in use remain on the tray when discarded night or morning. This form of basket is dustproof when closed and handy for travelling.

A table basket, trimmed and fitted, is easily carried from place to place and will rest on any table. It is less expensive and also makes a useful work-basket. One of this type has been successfully made out of a white chip basket, without a handle, used for picking fruit in the strawberry fields. The basket is wide and shallow and can be covered daintily with a length of white muslin.

BABY CHAIR. For sitting at table, a baby chair needs to be high, but it should preferably be low for play.



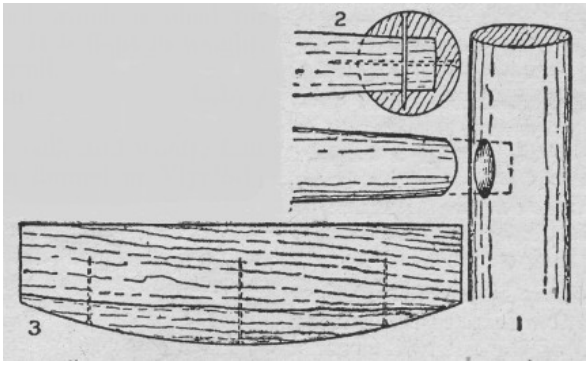
Baby Chair. Adjustable chair with play table attached. It can be raised to a high position.

Baby chairs are often fitted with a bar or board in front of the arms, and this must be easily removable. A footboard is generally provided, and in some chairs this is adjustable for height. In the folding chair illustrated the legs are hinged so that the lower part can be turned up the reverse way, the tray at the base serving as a table as shown. It is provided with wheels,

which allow it to be pushed about when in its low position.

Parts of chairs likely to need repairing are, first, the rails or horizontal rods which unite the legs. Often these are plain parallel rods of small diameter, and if broken a new one must be put in, for a strong repair of the old one is difficult. If it is turned to an ornamental pattern not easily matched, a repair may be attempted by gluing the broken place and perhaps screwing a strip of metal beneath to assist in holding the parts together.

Often a rail becomes loose without breaking, and when this happens other rails soon go the same way and legs become rickety. The ends of rails are glued into bored holes, as in Fig. 1. If they come out it is generally sufficient to glue them in again, but the parts must fit properly, and must be forced right home into their original positions. If the gluing does not seem satisfactory, a fine wire nail with small head can be inserted, as in Fig. 2, either crosswise or endwise. The latter is shown dotted. In some cases screws may be better than nails.



Baby Chair. Figs. 1-3. Diagrams illustrating correct methods of replacing rails and mending breakages. See text.

Next in importance to leg and rail joints are breakages like that in Fig. 3, where a portion is split off a flat piece of board. Here also it is stronger to repair with nails, rather than trust to glue, as is shown in the dotted lines on the diagram.

BACHELOR FLAT. Bachelor flats in Westminster or other expensive residential districts in London undertake to provide full service, including that of a valet, while meals are charged at fixed prices and, if a restaurant is attached to the block, served there or brought to the flats. Accommodation includes a bathroom and either one room with sometimes an alcove for the bed curtained off, or a bedroom and sitting-room.

Many bachelor men and women are unable to afford suites of this kind, but must simplify domestic arrangements so that they occupy the minimum of attention. In some cases where houses have been converted into single flats, with use of bathroom on each floor, cleaning service is provided but no cooking. In others no such arrangement can be made on the premises, and a charwoman may be employed to clean and, where there is a kitchenette, sometimes returns in the evening to prepare dinner.

Where only one room without service can be afforded, simple labour-saving devices should be installed where possible, and the idea of a bedroom should be remote during the day time. Comfort is essential to the worker, but all unnecessary ornaments and draperies should be discarded. Colour-schemes create beauty with simplicity of detail and thus reduce the cleaning problem.

Every day new devices appear for adding to the attractiveness and space-saving needs of the modern bachelor "flatlet": combined writing-desks and dressing tables, with detachable mirrors; sets of chairs which, placed together, form an extra divan to accommodate a guest at the last minute; dining tables which fold away into cupboards; and many others.

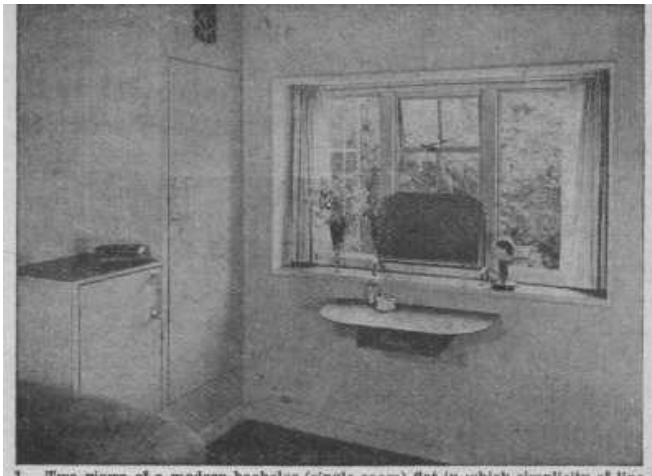
Parquet floors with rugs or small carpet squares are ideal, but, failing these, unless the boards are good, linoleum, which can be easily polished, is more satisfactory than mere staining. A vacuum cleaner is a practical help, but a carpet sweeper will serve. A corner cupboard fitted as wardrobe utilises space, the bureau or chest of drawers on legs and the long mirror can all fit into a sitting-room scheme. A divan lounge with separate mattress, and under the padded spiral springs a box for linen, is a suitable bed. The eiderdown rolls up into a case and forms a bolster cushion by day, and a fitted loose cover conceals all bedclothes. Small dressing tables can be obtained, which open out to disclose the toilet articles, but when shut look like an ordinary table. Unless accommodation provides a kitchenette or cupboard large enough to contain sink and small gas cooker and fitted with shelves for crockery and cooking utensils, the most convenient combination cooking and heating arrangement is a gas fire with a concealed boiling ring on top and a flap that lets down for grilling and reveals a small oven, together with a separate gas ring alongside for a kettle.

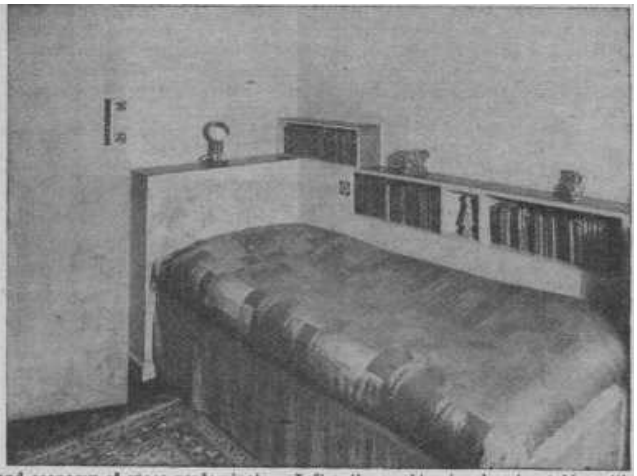
A gate-legged folding table for meals, and shelves fitted below window seats, for which cushions can be made to measure, are space savers. While it may be possible to make arrangements with the caretaker to receive parcels, it is desirable to provide a store cupboard so that catering emergencies can be met. The tenant may have little time available when shops are open to do marketing. *See* Attic; Bed-Sitting-room.



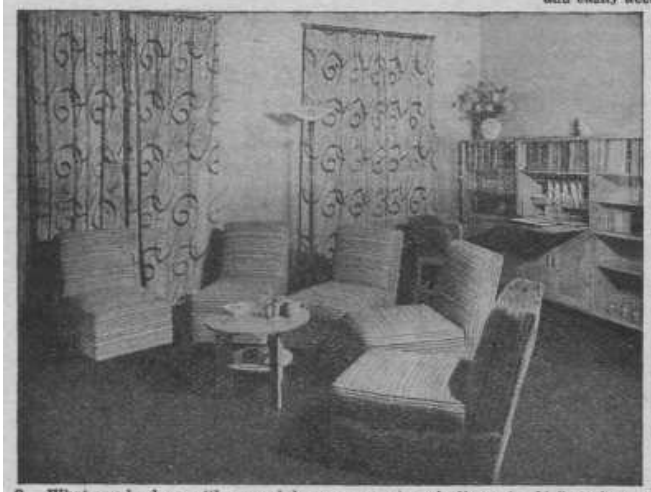
Bachelor's Button, the garden Ranunculus. (Sutton & Sons)

BACHELOR'S BUTTON. The name is locally applied to two distinct varieties of flowers. One is a form of the species of buttercup known as Ranunculus acris, which produces double yellow flowers. It thrives in ordinary border soil. The other is a variety of Ranunculus aconitifolius which bears double white flowers; this plant, which is known also as Fair Maids of





1. Two views of a modern bachelor (single-room) flat in which simplicity of line and economy of space predominate. Left: the unobtrusive dressing-table, with a mirror which can be removed, and an adjustable lamp for shaving. Right: the other end of the room, showing the divan with built-in bookshelves, reading lamp, and easily accessible switch

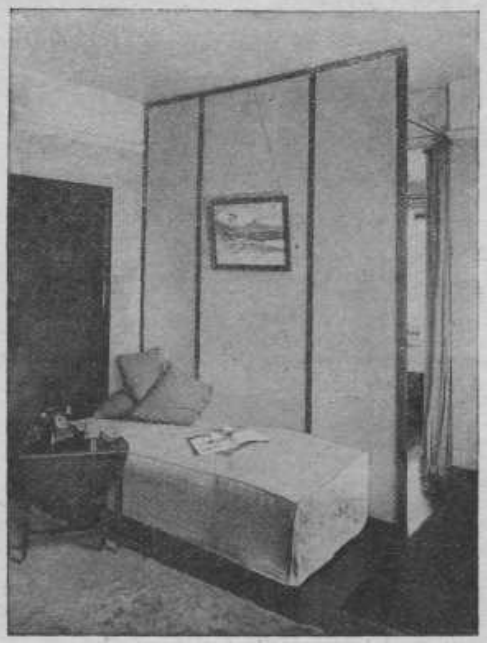




2. What can be done with a much larger room at one's disposal. At first glance, they appear to be separate dining- and sitting-rooms. Right: the collapsible dining-table, wooden chairs to match; the bedroom section is just visible on the extreme left. Left: sitting-room section, with fabric chairs for contrast, which, placed together, form an extra divan



3. The two flats illustrated in the first four photographs are "medium-sized" and "large," as bachelor flats go. Finally, we see some devices for making the most of a very small room. Left: a corner used as part of the seating for the dining-table. Right: a flatlet specially suitable for the "bachelor girl" who demands a kitchenette. Notice the partition which corners it off; also the home-made day cover for the divan. The tiny folding table and "baby-sized" telephone are in proportion, and help the illusion of making the room seem larger than it is.



BACHELOR FLATS

MODERN STYLE
& COMPACTNESS
ILLUSTRATED

Photos: Lincoln-Collins Studio; courtesy of Bowman's, Ltd.

France, likes moist soil and flourishes by the waterside.

BACKACHE. This may be part of a general condition, may be due to a local cause, or may have its origin in one of the internal organs. Influenza and smallpox frequently commence with a severe backache, and it is found in anaemia, hysteria, and neurasthenia. Examples of the local cause are backache from lumbago, stiffness from over-exercise, chill or weakness. Bright's Disease, gall-stones, and various feminine ailments are instances of pain referred from an internal organ. Pain between the shoulder-blades occurs in flatulence, and pain at the bottom of the spine is common in piles.

Where the pain is due to muscular stiffness or lumbago, the surest relief is given by rest in bed with warmth applied to the back either by hot-water bags or a mustard plaster, and later the rubbing in of a soap liniment or other embrocation.

Some people find comfort in a menthol or a belladonna plaster. Internally 10 grains of aspirin will be useful. In backache due to other causes the application of a hot bag may give ease. *See* Bright's Disease; Lumbago.

BACKGAMMON. Backgammon, or trictrac, is a game for two persons. It requires a special board and 30 draughtsmen, 15 white and 15 black or red. The board usually consists of two equal compartments with raised sides hinged together. The backgammon-board is marked with a series of 12 points at each end. The points are alternately coloured black and red, and each player has six points on each side of his board.

To begin play the board is placed between the players, so that the points lie in the same direction as the players' faces. One compartment of the backgammon board is known as the outer table, and the other as the inner or home table. These tables are not fixed by name, but depend upon the position of the men when the game starts.

With each backgammon-board two dice-boxes and a pair of dice for each player should be provided. After the men have been arranged ready for play, the right of first move is settled by the throw of the dice. The first player then throws two dice, and the two numbers he throws decide his move. The object of his game is to get all his men into his own inner table, and to play them out again before his opponent is able to succeed in attaining a similar object.

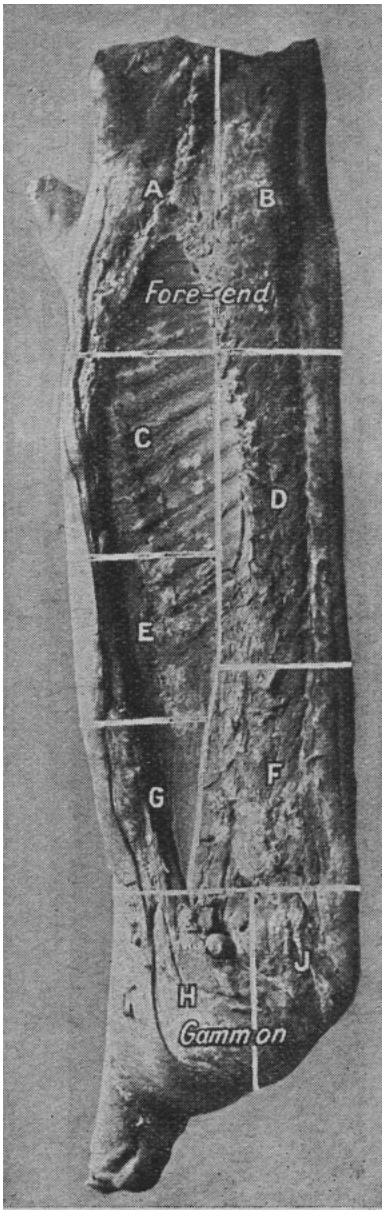
The actual ability to move certain pieces depends upon the position of the opponent's pieces. A single piece on a point is known as a blot. If such a piece is legitimately in the way of a player's move after a throw, it is removed and placed on the bar, and has to begin its move over again from his opponent's inner table. A player, having succeeded in getting all his pieces into his home table, begins to remove them from the board, or bear them off. At this stage of the game each throw of the dice enables a player either to advance his pieces according to his throw, or remove one from the board. He can remove only one, however, if his throw specifically allows it. The game is won by the player who first succeeds in removing all his pieces from the board.

When the winner has borne off all his pieces before his opponent has started to do so the game is called gammon, and if he succeeds in bearing off all his pieces while his opponent has still one or more pieces on the bar or in the winner's home table the game is called backgammon. For a gammon and backgammon, double, treble, or other increased stakes are paid.

BACON: THE CUTS AND THEIR COOKING

How to Choose and Prepare it for the Table

Separate Recipes follow, and related information will be found under Ham; Pig, etc.



Bacon. Side marked off to show the cuts.
A. Fore hock.
B. Collar.
C. Thick streaky.
D. Back and ribs.
E. Thin streaky.
F. Long loin.
G. Flank.
H. Gammon hock.
J. Corner gammon.

The flesh of the pig when cured, salted, or otherwise treated comes from all parts of the world. Wiltshire bacon, sold under that name, is from Wiltshire, but Wiltshire Cut on a label may refer merely to curing after the method of that district. There are four principal cuts— back, gammon, collar, and Bath chaps, or cheeks. The back is divided into best cut or loin, best streaky and flank. The best cut is favoured for breakfast rashers, though streaky parts are excellent. The flank is good for baking and boiling.

The gammon is divided into three cuts: upper, middle, and bone end or hock. The upper part makes a substantial joint for boiling, the middle is excellent for thick rashers to fry or grill. These are suitable for

lunch. The hock is useful for boiling, and with yellow split peas the stock makes good pea soup.

Boiled Bacon. Bath chaps are generally bought ready boiled and served cold. Prime or small back, gammon, corner and collar are all good boiling cuts for serving hot with chicken, turkey, etc., or as a cold breakfast dish.

Put the bacon after washing it into a saucepan of cold water to cover it. Bring gradually to boiling point, skim well and simmer until it is very thoroughly cooked. For one pound allow an hour, and an extra half hour for each pound after that weight. When cooked, peel off the skin, which should come away quite easily, and dust thickly with browned crumbs. The liquor in which the bacon was cooked must be thoroughly skimmed when cold and the fat put into a basin. Then pour boiling water over it, and let it stand. The cake of fat that rises to the top can be used for making pastry.

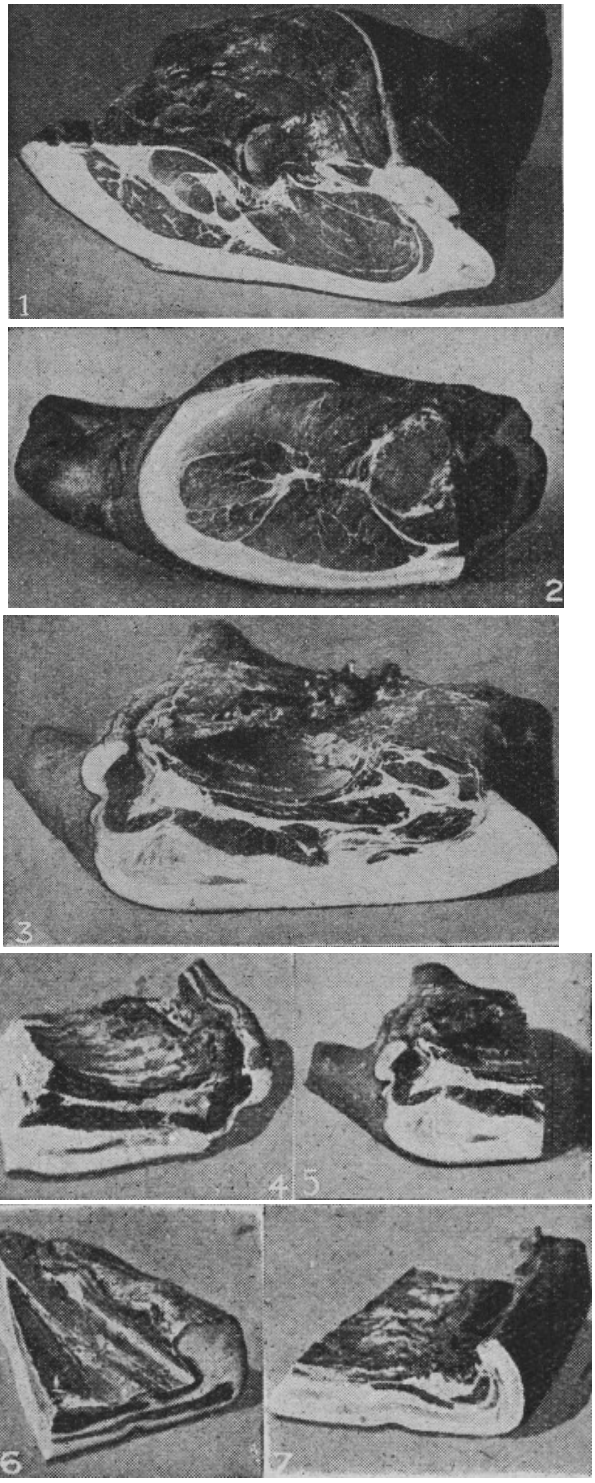
Fried Bacon. In a clean, heated frying-pan lay slices of bacon. Turn frequently and cook gently so that the lean is tender, but never let the fat become so hot that a smoke rises from it, or its value as bacon dripping is lost. When cooked, the fat should be tinged with brown and slightly crisp, but not chippy.

Toasted rashers are cooked either on a fork over a baking-tin in a Dutch oven before the fire, or can be grilled on a tin under a gas toaster. In each case the slices must be turned. Thin, trimmed rashers can be rolled to garnish chicken, veal, etc. Thread them on a skewer, running it through each and pushing them closely together to keep them rolled. Lay the skewer on a tin in the oven till the bacon is delicately crisped and browned, then draw out the skewer.

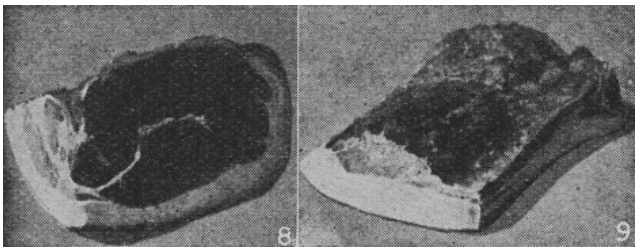
For baked bacon, take a piece of flank or any streaky cut and score the rind across with a sharp knife. Make the oven very hot and put the bacon in a baking-tin. When the rind has become crisp reduce the oven heat and cook gently to avoid excessive shrinking, allowing 20 min. to the lb. It should be served cold for breakfast.

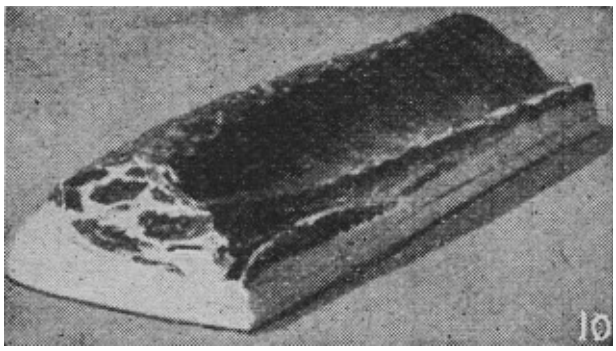
Bacon Dishes. French beans first boiled till tender, then fried in bacon fat with two sliced peeled tomatoes and served with rashers, are a change for breakfast. Bacon with cabbage is a favourite Welsh dish, being savoury for lunch or supper, as well as nutritious.Trim, wash carefully, and boil quickly about 2 lb. of spring cabbage. Then drain off the water, pressing the greens well, and chop. Trim and cut ½ lb. of bacon into largish cubes, and fry till crisp and lightly browned. Keep the bacon hot, and into the fat from it stir the cabbage, and a seasoning of salt and pepper. Add the bacon, mix and heat well, and pile on a hot dish. Garnish with fried bread. Shake over two tablespoonfuls of grated cheese. Heat in a quick oven till cheese is browned and serve. This quantity will be found sufficient for about four persons.

Bacon with macaroni is a useful dish for breakfast or supper. Break 6 oz. of macaroni into short lengths, about an inch long. Put into a saucepan with plenty of boiling water, salted, and boil until quite tender. Meantime trim and cut the bacon into cubes. Fry till lightly browned, and add the strained macaroni, one large peeled, sliced tomato and a careful seasoning. Heat all these very thoroughly, serve them piled in a hot dish, with crisp fingers of toast. This is sufficient for about four or five persons.



Bacon: principal cuts. 1. Gammon. 2. Gammon Hock. 3. Fore end. 4. Thick streaky. 5. Forehock. 6. Flank. 7. Thin streaky. 8. Corner gammon. 9. Long loin. 10. Back and ribs.





A good supper dish can be made from bacon and cheese. Toast on one side only as many slices of bread as there are persons to be served. Butter the side that has not been toasted and cover thickly with shredded cheese, pepper, salt, and a little made mustard. Lay on top of this two rashers of bacon and place in a moderate oven to cook slowly.

Bacon Curing. This is only undertaken safely in the cold months of the year from November to March. The first point in home curing must be to obtain a stone-??ld side of best fed pork.

Salt, sugar, and saltpetre are the usual ingredients employed in the cure, the first two being antiseptic, and the third bringing out the fine, rich, colour of good bacon. The sides can be cured either by the dry-salt process or the pickle process. The former commences with a vigorous rubbing of salt, repeated several days in succession, and then the side is left with a thin covering of salt, followed by a light sprinkling of saltpetre and granulated sugar. In 10 days from the last rubbing in, the salt, etc., may be removed and the side hung up in a cold, dry place. For protection from dust and other contamination it should be enveloped in a thin butter muslin covering.

To ensure adequate curing, the thicker parts, such as the gammon and the fore end, should be injected with brine by an ordinary pickle pump. A good pickle for this purpose is composed of 1 lb. of saltpetre, 1 lb. of Demerara sugar, 11 lb. of salt, and 4 gallons of water. This same pickle is sufficient for curing by the wet process, which is done by immersing the side, or parts, in the pickle and keeping it for 10 days, covered with the brine. The result of this cure, either by the dry or the wet process, is known as green bacon. For added flavour the bacon can be smoked by being suspended in a square stone cubicle, with an opening at the top to let out the smoke, the floor being covered with peat and set alight, and the bacon kept therein from 36 to 40 hours.

BACON CUTTER. A bacon cutter suited to domestic needs consists essentially of a strong base, generally of cast-iron, heavily enamelled. Mounted upon an upright is a circular steel knife or cutter rotatable by a crank handle and gearing.

A tray or carriage provided with a safety guard is pushed along on guides on the base, and carries the bacon or other food to be cut into slices, means being provided to adjust their thickness. In operation the crank is turned with the right hand; the left holds the bacon on the carriage, which is pushed past the revolving knife, and a slice is cut off, the process being repeated as often as required. The same machine may also be used to cut bread.

Bacteria. *See* **Microbes.**

BADGER BRUSH. For shaving, tooth and painter's brushes badger hair is used on account of its softness. It is grey on the end with a black portion under, the lower portion being of a creamy shade. Being an expensive article, it is widely imitated, e.g. by dyeing hog and similar bristles. The real hair is fine, silky to the touch, straight and springy. A badger-hair shaving brush will wear right down to the stump and still remain soft and springy.

Painter's brushes must be cleaned directly after use. They should be washed in warm water with a little washing soda and rinsed in clean water. If used with varnish or varnish paint, this should be dissolved with turpentine before washing. *See* **Brush; Shaving.**

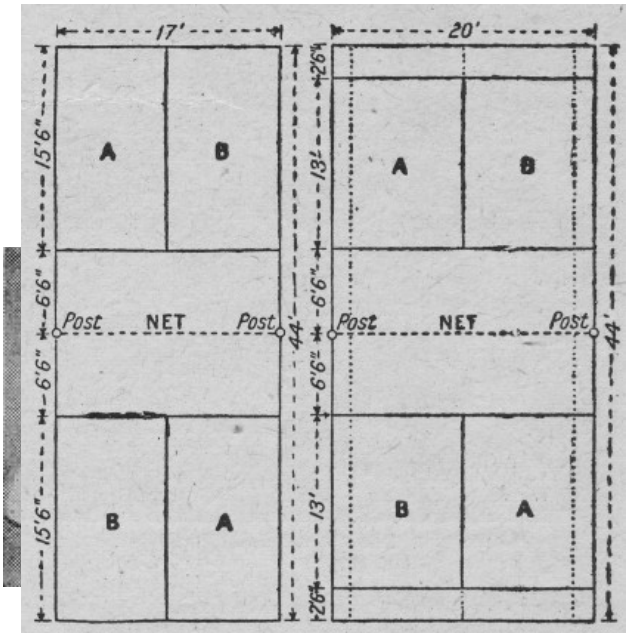
BADMINTON: How to Play it. The popularity of this game has increased astonishingly in recent years, rivalling that of squash rackets. Badminton clubs are widespread, and All-England championships are held.

The strokes are not unlike those in lawn tennis, but a shuttle takes the place of the ball. The shuttle is in play from the time that it is hit by the racket until it touches the ground or the person or dress of any player, or until a fault or let occurs, this period being known as a rally. There is no first bound as in lawn tennis and the service may not be overhand. The shuttle, at the instant of being struck, must not be higher than the server's waist. Most players hold the shuttle loosely close to the cork part, and the object is to hit the shuttle in such a way as to make it difficult for an opponent to return it.

Scoring at Badminton

The scoring is adapted from that used in rackets. In the doubles, when one pair of players opposes another pair, and in the men's singles, when there is one player on each side, the game usually consists of 15 aces. When the score happens to reach 13 all, the side which has first arrived at 13 has the option of setting the game to 5. In other words, the side may, and generally does, elect that the game shall continue until one side or the other has won five additional aces.

In the same way, when the score is 14 all, the side which has reached 14 first has the option of setting the



Badminton. Left, court as it should be marked out for singles; right for doubles game.

game to three. In either case, when the game is set, the score is called love-all, and the side which first scores 5 in the first instance or 8 in the second, wins the game. Generally in ladies' singles the game consists of 11 aces. Here again the game may be set at 9 all to 5, and at 10 all to 3. The match is decided by the best of three games, which is the rubber.

In badminton, as in rackets, a side (or in singles a player) is either in or out. The scoring can only be done by the in side; the business of the out side is to put the other side out. In the doubles the side (A and B) which begins the game has only one hand in its first innings. Thus when A is put out, B does not serve, and the service goes to the other side (C and D). But after D is put out the turn of the other pair comes, and so on to the end. The service is delivered alternately from each half court into the half court diagonally opposite. After the service the players can take up positions where they please till the rally is ended.

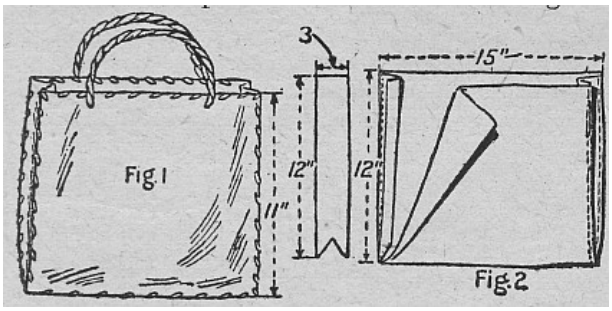
The diagrams show that the court for singles is as long as that for doubles, but not quite as wide. For convenience both courts are generally marked out in one, the dotted lines in the diagram of the doubles showing where the singles court comes.

BAGS AND HOW TO MAKE THEM

Some Attractive New Ideas for the Needlewoman

For details of Methods employed see Applique; Beadwork; Embroidery; Tapestry; and for Bags in other Materials see Leather; Raffia, etc.

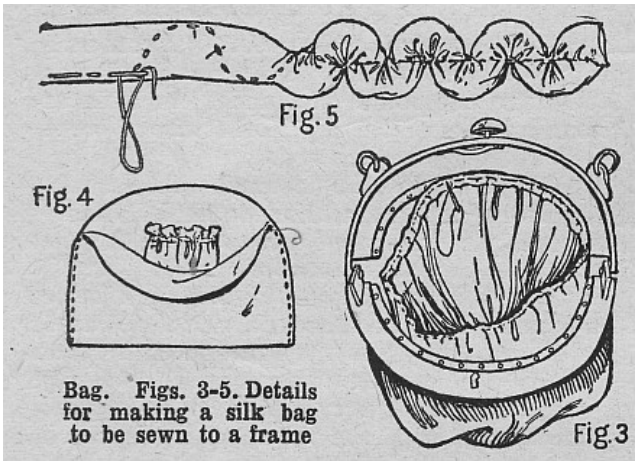
A shopping bag is shown in Fig. 1. It may be of American cloth, hessian, or striped canvas. It should be lined through with cretonne or similar fabric to give extra strength, and requires ½ yard of 24-in.-wide material, with the same quantity of another fabric for lining. Take the material for the outside, and cut a 3-in.-wide strip from one of the cut edges, not the selvedges; then cut this strip in half, to obtain two strips 3 in. wide and 12 in. long.



Bag. Fig. 1. Simple shopping bag. Fig. 2. How it should be cut out and the gusset inserted.

Cut a V-shaped piece out from one end of each of the two strips, as in left-hand side of Fig. 2. Fold each strip lengthwise down the centre, and sew the edges of the V-shaped opening together. Now fold the larger piece of material to bring the selvedges together, as in Fig. 2, with right side inside. Join the long edges of the folded strips to the side edges of the larger piece (Fig. 2) so that the narrow strips are sandwiched between the two layers; then turn the bag right side out.

Make up the lining in the same way, and slip it inside the bag with seam turnings facing, turn top edges in to meet, and oversew along with embroidery silk, a fine coloured twine, wool or raffia, finishing the remaining edges with decorative oversewing to match. Next cut small holes within the top edges to take handles, and oversew or buttonhole the edges round for strength; then add handles of cord, or strips of material doubled and stitched along. Hand embroidery or appliqué work can be added as a decoration.



Bag. Figs. 3-5. Details for making a silk bag to be sewn to a frame

Frame-mounted Bags. Handbags of silk and other materials, mounted into a frame of ivory, tortoiseshell, or an imitation of either, or of metal, with chain handle, or one made of the material can be easily worked at home, frames being purchased. These are made with rows of tiny holes through which the bag is sewn on. The bags are lined and may be supplied with pockets to contain powder puff or mirror, while the top of the

lining is finished off with a narrow ruching, galon, or silk floral trimming.

Details for making such a bag are shown in Figs. 3-5. The mount or frame illustrated measures about 6½ in. in width; ½ yd. of 18 in.- wide silk for the outside of the bag is required, and also ½ yd. of 18 in.-wide silk for the lining. If there is no handle to the frame, to make one cut a strip off the width of the material 1½ in. wide, fold double, and stitch along for strength.

Begin by taking the silk for the outside of the bag, folding it into halves, and then cutting off the two top sets of corners to form a circle. Now turn in the edge of the silk circle to the wrong side and run in a gathering thread, leaving long ends of cotton. Open out the frame or mount to its full extent, so that it will lie flat on the table as in a circle, and measure all round the inside edge of the frame where the tiny holes are. Then draw up the gathering thread along the silk edges to make them the same size as the mount. Sew the bag into the mount, working from the inside, according to the pattern sketched in Fig. 3.

Pass the needle through the edge of the bag and through one of the holes to the outside; then carry the needle below the frame edge, and push it through the silk to the inside again, then passing on to the next hole. Take the silk for the lining, and from it cut a strip measuring about 17 in. long (an inch less than the length of the bag silk) and about 8| in. wide; that is, 2 in. more than the width of the frame. Fold this strip in halves with the right side inside and curve off the top corners slightly. Then seam up the sides as far as the commencement of the curves.

A pocket for holding a small mirror and comb, and made of a square of material, hemmed at the top and having an elastic run-through hem, can be stitched to one side of the lining before it is seamed up, as suggested in Fig. 4.

Turn in the curved top edges of the lining and gather up lightly, then slip them inside the bag, and hem them to the top of the latter. Finally, add a strip of floral trimming, or ruching, over the edges. Ruching is made by cutting on the cross a long strip of the lining silk, about 1½ in. wide, folding it over with the wrong side outside and running it along as though for an ordinary rouleau. Turn inside out with the aid of a small safety pin, and with sewing silk to match, run it in a zig-zag line from side to side, as shown in Fig. 5. When this gathering thread is drawn up, a pretty trimming is the result. This can be sewn to the bag along the gathering thread, which should now run in a straight line down the middle.

Flat shaped bags on stiff, one-piece tortoiseshell or wooden mounts show off embroidery or make up well in heavier materials such as tapestry, tweed or moiré. To make such a bag in brown moiré silk, with shell mount and lining of moiré to tone, cut two pieces of moiré, one for cover and one for lining, 9 in. wide and 14 in. long; fold in half, making depth of bag 7 in. Join up the side seams and slip the lining into the bag, oversewing together at top; attach a small square tab on one side, made of double moiré. Turn in corners, fit into frame and finish off lining with a narrow gold galon.

An effective way of using strips of embroidery with a right-angled silver frame and cord-padded handle is shown in Fig. 6.



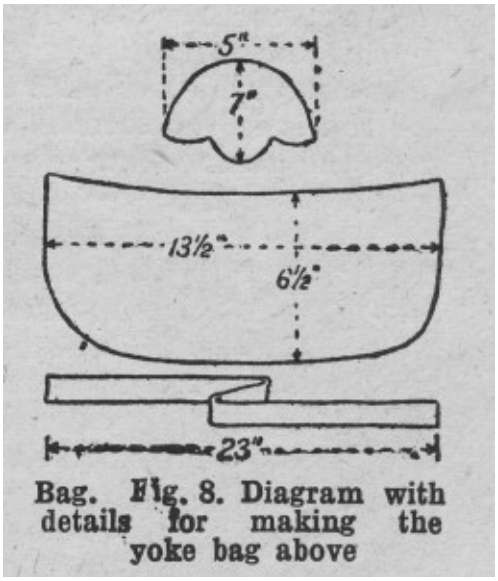
Bag. Fig. 6. Brocade bag mounted upon a silver frame and having a handle of covered cord.

A variation of the framed bag has a yoke piece as in Fig. 7. A paper pattern can be cut to desired size from the diagram (Fig. 8). It requires a gilt frame, ¼ yd. black silk, and the same amount of lining silk, and may be embroidered on one side. Cut a strip of covering and lining silk, each 23 in. long and 2 in. wide. The yoke part must be stretched flat. Join the two main parts of bag to edge of 23-in. strip, letting in piping cord covered with black silk (the lining requires no piping). Turn up the scalloped edge of yoke pieces and sew over a strip of cord. Fix lining to yoke and invisibly sew to gathered lower part. Sew top edge to frame and cover stitches with narrow bead trimming.

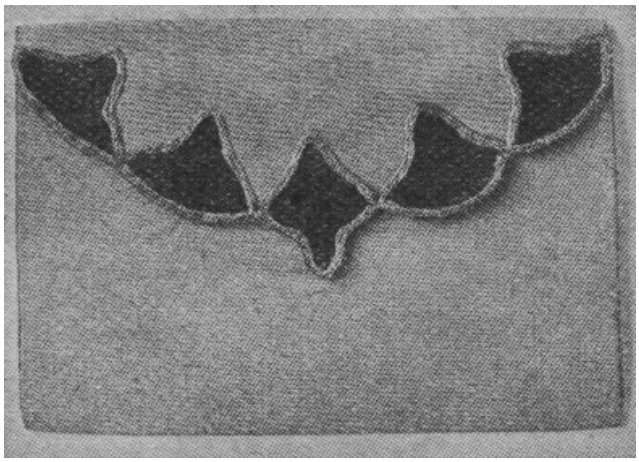
Bag. Fig. 7. Silk bag gathered on to a yoke piece the top of which is sewn to a gilt frame.



Pochettes. Two pieces of material, for lining and for cover, each measuring 18 in. by 9 in. and folded in. three, are needed for a simple pochette bag. If to be embroidered, trace the pattern on the first 6 in. of cover and press before making up.



Bag. Fig. 8. Diagram with details for making the yoke bag above



Bag. Fig.9. Pochette in heavy corded silk with an appliqué trimming outlined with tinsel thread.

Interline with buckram to stiffen before folding the bag into three and oversewing the two sides. Such pochettes are useful for evening bags, but not for hard wear. They may be fastened by press studs concealed under the flap or by a jewelled button and tinsel cord.

For a more practical pochette side gussets are required. Fig. 9 could be carried out in heavy corded silk and lined and trimmed with the same in contrasting shade. The trimming has been edged with tinsel thread (six rows) and couched on to the flap. Cut cover and lining, as shown in Fig. 10, to measure 9 in. by 20 in., also a piece of buckram ¼ in. smaller all round; draw and cut a paper pattern of the trimming, three times size of diagram, lay on material and cut out (see diagram). Having marked position, tack neatly and sew the trimming to bag, pressing afterwards with a slightly warmed iron on the wrong side of material. Tack cover to buckram, turning edges of material over the buckram so that the trimming comes on edge of bag. Then slipstitch lining to cover. Cut the gussets in covering and lining silks, turn in the edges and stitch together. Fold the bag and neatly sew in gussets. Such a shape lends itself to a variety of trimmings; a central applique ornament may be used, a monogram, or the whole flap may be gaily embroidered; or it may be cut out in an env elope shape and made of brocade.

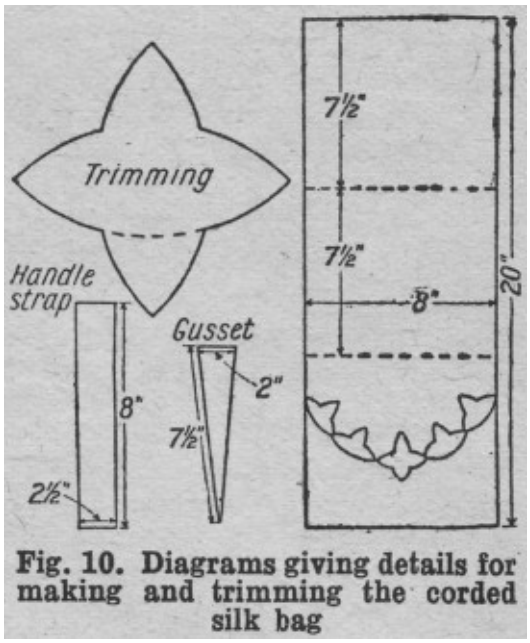


Fig. 10. Diagrams giving details for making and trimming the corded silk bag

BAGATELLE: How to Play. The bagatelle board or table is usually from 6 to 10 ft. long, and from 1½ to 3 ft. wide. It is made to fold up, can be placed on a table for play, is of wood covered with green cloth, and the sides are cushioned with rubber. When open the top is in the form of a semicircle, and let into the surface are nine rounded holes or cups, each the size of the nine balls used. These holes are numbered 1 to 9. Some tables have pockets in addition to holes, but with these the game is more akin to billiards.



Bagatelle Board

The players, using a cue on the model of an ordinary cue, play from the end of the table opposite to the holes. Each player in turn takes eight balls, 4 white and 4 red, while a ninth, a black one, is placed on a spot in front of the holes. His object is to drive the balls one by one into the holes, but before scoring he must hit the black ball.

The scores count according to the holes into which the balls are sent, save that the black ball counts double. A player will aim at driving all the balls into holes, reserving the black ball for the one marked 9. The game is usually for a n agreed number of points, and most boards have holes and pegs at the sides by which the marks can be recorded. If the game is played by more than two persons, sides will be chosen, and members of each will play alternately.

A number of other games can be played on the bagatelle table. One is the cannon game, in which only three balls are used, as at billiards, by two players. Two of them are placed in position, the black on the spot and the white between holes 1 and 9. The striker plays with the third ball, and to score must cannon before driving a ball into a hole. If he drives one without cannoning the score counts to his adversary. Two is scored for a cannon, while points go to the other side if the balls are missed. As in billiards, he continues to play until he fails to score. For this game there is a special table without holes.

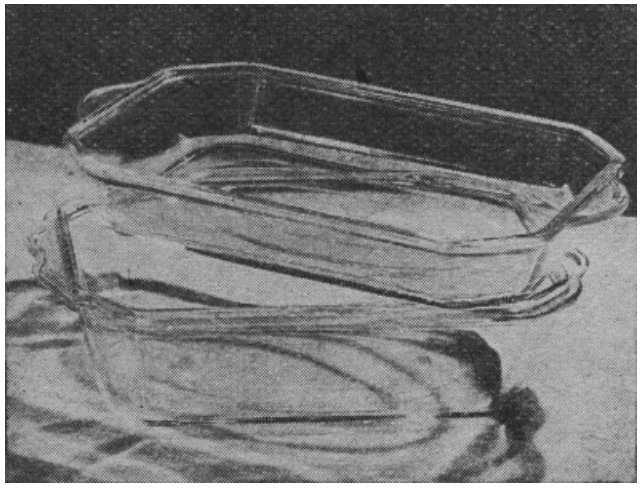
BAKED JAM PUDDING. Take 1½ breakfastcupfuls breadcrumbs and pour over half a pint hot milk to which has been added 1½ oz. margarine or butter. Sweeten with 2 tablespoonfuls sugar, flavour with a few drops vanilla essence, and add the beaten yolk of an egg, and bake in a moderate oven. Then add the white beaten up with sugar and spread on the top over a thick layer of jam. The pudding must then be put back in the oven for the white of egg to brown. Serve sprinkled with fine sugar.

BAKELITE. This is a synthetic resin formed from phenol and formaldehyde. It is infusible, resists acids and solvents, and has great strength as a dielectric. For use by manufacturers it is supplied in a form allowing of fusion, but after heating to a certain temperature the material solidifies, hardens, and thereafter resists fusion.

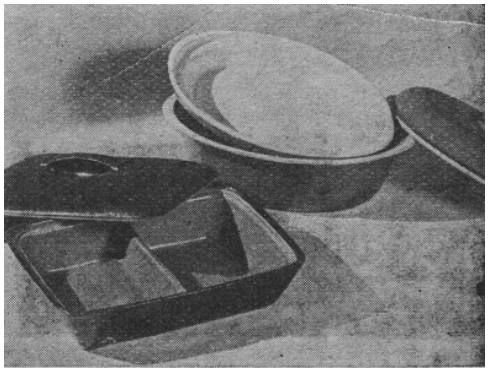
Bakelite is readily moulded into intricate forms, and is extensively employed for switches, plugs and other electrical apparatus, as well as for household utensils, being practically unbreakable.

BAKEWELL PUDDING. For serving either hot or cold, this is a convenient sweet. To make it, line a pie-dish with ordinary short crust. On top of the crust spread a layer of jam, and fill in remainder of dish with the following mixture. Cream together 2 oz. each butter and castor sugar, and add to this a beaten-up egg and 2 oz. ground almonds, with a little almond essence. Beat well and put in the pie-dish on top of the jam. Then bake the pudding in a quick oven until thoroughly browned. Sufficient for 6 or 7 persons.

BAKING AND ITS UTENSILS. While a roast of meat is cooking in its later stages, baked puddings, scones, buns and short-crust pastry needing the same beat may share the oven; but puff pastry, which requires a very hot and dry oven, would be spoiled if cooked in the same oven as meat. Much good pastry is ruined in baking. For ordinary pastry, the oven should be 375 to 380 degrees in temperature; for puff pastry 400 degrees. Otherwise the pastry will be heavy and oily. Bread requires to bake in a moderate oven. Joints of meat should first be placed in a very hot oven to seal up the surface and prevent too much of the juice escaping. When the meat is well browned the heat can be moderated. Milk puddings without eggs should at first be placed in a hot oven to bring near boiling point, then allowed to cook slowly. Eggs may be stirred in at this stage. Custard pudding, or any pudding containing eggs, requires a moderate oven.



Baking. Up-to-date glass overware: the top is either a lid or another dish.



Baking. Fireproof earthenware of the casserole type, double and divided.

To bake a cake well is one of the most difficult branches of the cook's art. To ascertain the heat of the oven, sprinkle a little flour on a baking-tin and place in the oven. If the heat is just right for the cake the flour should be of a good yellow colour in about one minute. The oven should be kept at this moderate heat throughout.

Opening and shutting the oven door should be avoided as much as possible, as draughts cause a sudden drop in temperature which often spoils cakes and pastry.

Special thermometers for baking are now made, and if used the following temperatures (Fahrenheit) should be recorded:

Meat	300-10
Pies	290
Cakes and pastry	320
Bread and puff pastry	340

All kinds of pastry require to be baked in a very hot oven at first, to expand the air enclosed in the pastry, so that it raises and lightens the flour. If the temperature of the oven is not sufficiently high to set the pastry quickly the air or gas will escape, and the pastry sink again and become heavy. A sharp heat is also needed to swell quickly and burst the starch-grains in the flour, and thereby enable them at once to absorb the fat used as it melts. Unless this happens the warm butter or lard merely oozes out on to the baking tin, and the pastry becomes hard and chippy. It must always be remembered that the richer the pastry the hotter must be the oven. When the pastry is set, the heat must be slackened to prevent it burning.

Heat the oven whilst preparing the dish for which the pastry is to be used. If a coal range is used, make sure that the flues at the back of the stove and round and under the oven are clean and free from soot, otherwise a proper heat will never be attained.

An oven with a good bottom heat is desirable for pastry-baking, and the top shelf is always the hottest. This shelf throws down the heat on to the food and thus browns it. Should the pastry seem likely to be too dark before everything is cooked through, this shelf can be pulled right out from the oven. Another plan is to lay a sheet of stout paper over the pastry.

When putting pastry into or on to tins it is unnecessary to grease them, as there will be sufficient in the pastry itself to prevent it sticking, and to add more only wastes fat and increases the risk of burning. After the pastry is completely baked, let it cool down in a warm place, and not in a draught. It is a mistake to hurry it away into a cold larder, as by so doing the steam in it condenses and the pastry loses its crispness and becomes tough.

Baking Utensils. Double baking pans are best for oven roasting. They can be obtained in oblong or square shapes and in all sizes. Patty pans for baking cheesecakes, mincepies, etc., are made of tin, fluted or plain, and may be oval, round, shallow, or deep. Open jam or syrup tarts require tartlet pans, with plain or fluted edges. Raised pie-moulds, in which raised pork, veal, or game pies are baked, are made to open at the side, and the bottom is movable.

Flan rings consist of a plain or fluted ring with no bottom, and stand on the baking sheet. Cake tins of all sizes are made in strong tin; the bottom may be movable.

A border mould with a hole in the centre, so that a cake border can be made if required, must be kept only for that purpose, not used for jellies, etc. One or two bread-tins should be in every kitchen, for home-made bread is not difficult to bake, and a cake baked in one of these tins looks inviting. Shallow tins, about one inch in depth, are used for Yorkshire puddings; several baking sheets are necessary on which to place small patty and queen-cake tins.

Dishes and pans in fireproof ware and also fireproof glass, an apple-baker, with wells for the fruit, ramekin cases in which to cook and serve numerous dishes, and soufflé dishes, in various sizes, are all baking requisites.

BAKING POWDER. Baking powder is made as follows: (a) Tartaric acid, 18 oz.; bicarbonate of soda, 20 oz.; ground rice, 2 lb.; (b) cream of tartar, 2 lb.; bicarbonate of soda, 1 lb.; ground rice, 1½lb. Cheaper ingredients used in place of tartaric acid and cream of tartar are acid phosphate of calcium and acid sulphate of potassium.

As the chemical action begins as soon as water is added to the baking powder, any dough in which baking powder is used should be put into the oven as soon as it is made. The heat of the oven causes the gas to be given off more quickly, so that the dough rises rapidly. At the same time it is forming a hard crust, so the gas cannot escape.

BALATA. This is a combination of guttapercha and other natural gums and cotton dux. The gum of the S. American bully tree (balata) enters largely into its composition.

Its original use was as a substitute for leather for the driving belts of machinery, but it was discovered that it had qualities which made it eminently suitable for soling footwear, being not only very durable, but light, flexible, and absolutely waterproof. Boots and shoes soled with Balata should not be placed near artificial heat to dry.

BALDNESS: Its Treatment. A prevalent cause is scurf or dandruff. Frequent washing of the head should be avoided, and growth may be induced by the use of a stimulating lotion.

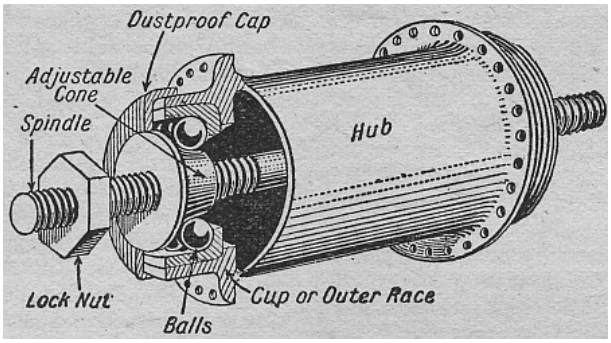
During convalescence from typhoid or severe measles or scarlet fever there may be a sudden and pronounced falling of the hair. This may also occur after a perfectly normal pregnancy, but in these cases new and vigorous growth will take place within a few months' time.

Alopecia areata or baldness in circles may occur in several members of a family through some infection which is often traced to the mouth, nose, or tonsils. The patches may be painted with iodine or sulphur, or a stimulating lotion may be used. At the same time attention should be directed to improving the general health. *See* Hair.

BALL BEARINGS. These comprise all types of bearings where the working parts are separated by means of metal balls, relatively small in diameter. The chief advantages from the use of ball bearings are the easy running qualities due to reduced friction between the bearing surfaces, simplicity of adjustment, and long life, if properly cared for.

There are two great classes of ball bearings: (1) the cup and cone type, as extensively used on bicycles; and (2) radial bearings, used on small electric motors, and

for bearings in motor-cars and other purposes. Ball thrust bearings are adapted to take an endways thrust. An example is the bearing in a cycle steering-head.



Ball Bearings. Hub of a bicycle partly cut away to show cup and cone bearing.

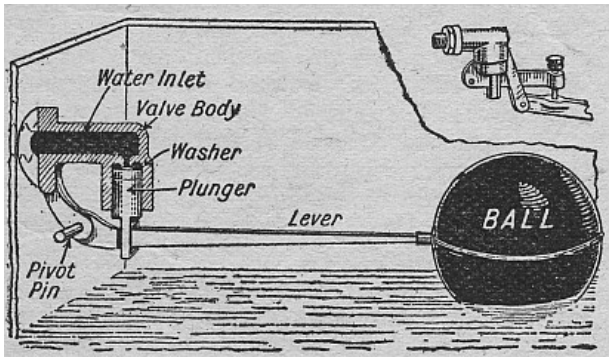
A typical cup and cone bearing, as used on a cycle hub, is shown in the illustration. The cones are mounted on a spindle, one is firmly fixed thereto, the other works on a screw thread, and provides the means of adjustment.

The balls run between the cup and cone, and sufficient of them are used to form a complete circle. To adjust any bearing of this type, slacken the locking nut and rotate the movable cone until every trace of slackness or shake has been eliminated. The locking nut is then tightened up hard.

To clean a ball bearing, take out the cones and spindle, placing a clean piece of paper or a large tray on the ground to catch the balls as they fall out. Then wash the balls, cups and cones in paraffin, and clean the hub or part from which the bearing has been removed. Assuming there is no wear or damage, the bearing may then be reassembled. First fill one cup with vaseline or thick grease and place it on the bench with the cup horizontal. Insert the balls one by one into the cup (the vaseline will prevent them falling out), then insert the spindle and fixed cone. Hold the spindle in place and invert the bearing, thus allowing the spindle to rest upon the bench. Support the bearing with blocks of wood if necessary. Insert the balls in the other cup as before. Finally, screw the adjusting cone on to the spindle and adjust as already described. *See* Bicycle; Motor Cycle.

BALL COCK: In House Cisterns. The principal purpose of a ball cock is to regulate the flow of water into a tank or cistern, its action depending on the buoyancy of the ball, which is hollow and made of copper. It is attached at one end of a lever arm, the other end of which is pivoted to the valve body or tank. Near this end of the lever is a small plunger that moves loosely in the valve body and is arranged to close the water inlet.

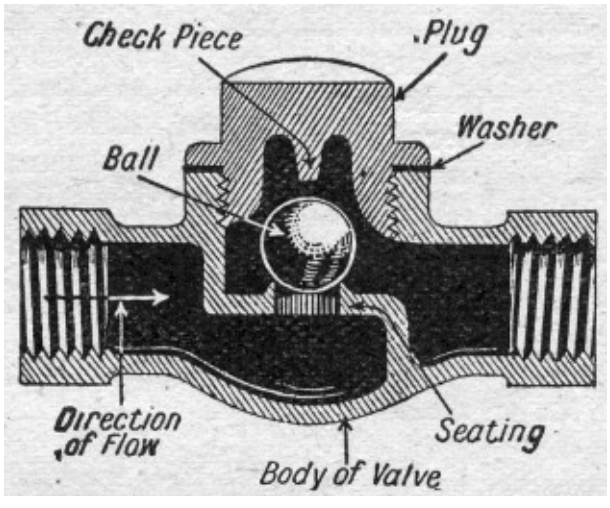
Assuming the cistern to be empty, the ball hangs down, the lever is depressed, the plunger falls, and water is admitted. As it rises in the tank the ball floats on the water, and gradually lifts the lever. Finally, when the desired height of water is attained, the lever has lifted sufficiently to close the water inlet by forcing the plunger hard up against the valve face. It remains in this position until the water level falls, when the same cycle of operations is once again gone through.



Ball Cock. How the floating ball controls inlet of water. Inset, valve part of high-pressure type.

Should the cistern overflow, the remedy will not be far to seek if these facts are borne in mind. Examine the ball itself; see if it leaks; if so, remove the ball and lever complete by removing the pivot pin. Then drill a small hole to allow the water to escape and carefully heat the ball over the gas flame to dry out all moisture. Finally clean the ball and resolder it, making sure it is watertight. If the water level is too high, bend the lever down; if too low, raise the lever. If the water inlet valve leaks, the leather or fibre washer may need replacing. *See* Cistern; Water Supply.

Ballroom. For instructions how to prepare *see* Dance.



Ball Valve. Section of the simple type of ball valve used in tire pumps.

BALL VALVE. The particular advantage of a ball valve is that it opens readily and gives a free and unrestricted passage through the valve body. Typical examples are the oil pump of a motor-cycle and the foot valve of a tire pump. The valve consists of a metal ball. To ensure perfect functioning, the ball must be clean, must seat on a knife edge, or very narrow seating, and must be prevented from lifting too high off its seating.

The diagram makes the construction of such a valve quite clear.

BALM. The plants of the genus Melissa, a hardy herbaceous perennial with aromatic stems and leaves, are classified as balm. They flower in the summer months, at which period the stems should be cut off and stored for winter use. Balm leaves make a good pot-herb and were formerly used extensively. The plants may be increased by division of the roots in autumn, or by seed sown in March. Any ordinary garden soil suits them,but they prefer a sunny border.



Balm. Aromatic leaves of this garden pot-herb.

BALM OF GILEAD. This is the popular name of Cedronella triphylla, a sage-like plant from the Canary Isles: it bears purple flowers but is valued chiefly for the sake of its fragrant leaves. It is hardy only in mild districts. Propagation is by cuttings under glass in spring. When nosegays were fashionable, they invariably contained a few fragrant sprigs of Balm of Gilead.

BALSAM. This is a half-hardy annual belonging to the genus Impatiens, the main types being camellia-flowered and rose-flowered. The balsam is liable to damage in bad weather and it is thus more useful for the greenhouse than for flower beds. When balsam is grown in greenhouse or conservatory, it should be watered freely when well rooted and must be potted in rich soil.



Balsam The double camellia-flowered variety. (Sutton & Sons, Ltd.)

It is raised from seed sown under glass in February or March, and potted in a compost of three parts loam, one part manure, and a little sand. The double white camellia-flowered balsam rivals the begonia in beauty. The common Impatiens glandulifera has white and pink flowers, and in a shrubbery is often a nuisance because of its enormous faculty of reproduction. Pron. Ball'sum.

BALUSTER. The term is given to the supports of handrails, barricades, etc., which may be turned, shaped, or square, the last named being sometimes fixed at an angle. *See* Railing; Staircase.

BAMBOO. The genus of grasses known as bamboos belong to three groups, Arundinaria, Phyllostachys and Bambusa. They are graceful evergreens which flourish best in moist soil and a sheltered position. They are most attractive from midsummer to early spring; between February and July the leaves become shabby. Some of the best hardy bamboos for British gardens are Arundinaria anceps, 8-10 feet, A. nitida, 8-10 feet, A. Simoni, 12-15 feet; Phyllostachys fastuosa, 15-20 feet, and P. nigra, 8 feet. Attractive low-growing kinds are Bambusa tassellata, 3 feet, with very large leaves; pygmaea, 15 inches, and Veitchii, 15 inches. The two last named are improved by being cut down almost to the ground each year.

BANANA. A natural food containing all the substances of which the average meal is composed, namely protein, fat, carbohydrates, salts and water. It is deficient only in Vitamin C. Bananas should not be eaten raw unless quite ripe. On account of its slipperiness, the fruit is often swallowed without proper mastication, and may cause indigestion, especially with children, for whom it should preferably be mashed. See Diet; Food; Vitamin.

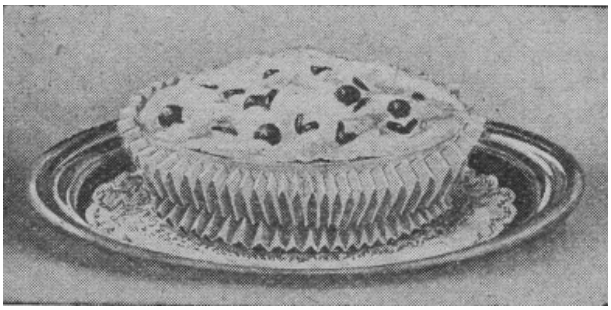
BANANA CHARLOTTE. Line the bottom of a plain charlotte tin with a layer of sweet jelly and decorate with strips of angelica and glacé cherries. Trim the required number of finger biscuits and line sides of mould so that they fit closely. Beat up 3 fresh eggs and stir into them a pint of boiling milk sweetened with 2 oz. castor sugar. Put this in the pan and stir over the fire with a wooden spoon; when the consistency of cream add the pulp of 4 ripe bananas.

Stir in ½ oz. dissolved gelatine, add ½ teaspoonful vanilla, and lastly ½ pint whipped cream. Just before the cream begins to set pour it into the prepared mould and place it on some ice to set firmly. The shape should be unmoulded carefully on to a cold dish and then served.

BANANA ECLAIR. Put ½ pint of water and 2 oz. of butter in a saucepan. Boil and having removed to a slow fire, add 6 oz. flour and stir well with a wooden spoon for 10 minutes. When cold, add 4 eggs, one by one. Next pass the mixture from a large pastry bag through a large piping tube on to a buttered dish, making each piece about the size of a walnut and about an inch apart. These should be baked in a moderate oven for half an hour and then taken out to cool. To prepare the cream take 2 eggs, 1 oz. flour, 1 oz. sugar,

½ pint milk, and 6 ripe bananas, which should be passed through a sieve. Boil the milk, add the flour and sugar, and beat all up well with the eggs. Cook a little without boiling, add the banana puree, and mix thoroughly. When cold, cut off the tops of the pastries and stuff each with the cream, afterwards replacing the tops and sprinkling them with sugar.

BANANA PRINCESS PUDDING. Peel and mash 6 bananas, afterwards placing them in a greased pie-dish. Add a layer of apricot jam, and let it get warmed through in a moderate oven. Whip the whites of 2 eggs with castor sugar until they are quite stiff, cover the pudding with it, return to the oven and bake until a golden brown. This will take about 5 min. This pudding may be served either hot or cold.



Banana Princess Pudding with angelica and cherries.

BANANA TRIFLE. Take 8 sponge cakes, a pint of custard, some jam, 3 bananas and 1 oz. of blanched almonds. Cut the sponge cakes in half and place a few in the bottom of a large crystal dish. Spread them thickly with strawberry jam, and add a layer of sliced bananas. Repeat the process until the dish is full. Make a good custard flavoured with vanilla essence, and pour over the trifle while hot. Leave it to soak well, garnish the top with blanched almonds and a few strawberries out of the jam. The top may be decorated with whipped and sweetened cream and crystallised cherries, violets and angelica, as shown in the illustration.

BANBURY CAKE. These are scraps of pastry with a mincemeat of fruit in the centre. To make this mincemeat, cream 2 oz. butter and add to it ¼ lb. chopped orange and lemon peel, ½ lb. currants, ½ teaspoonful ground cinnamon, and the same of ground allspice. Lay a little of this mincemeat between two oval pieces of puff pastry, pinch the edges, brush over with egg, and sift powdered sugar over the top of the cake. Bake in a quick oven till the pastry is browned lightly and has risen well. Sprinkle again with sugar and serve hot. This quantity is sufficient for 10 or 12 cakes.

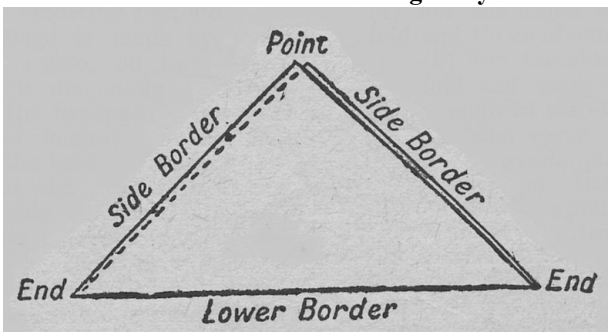
BANDAGES FOR WOUNDS AND DRESSINGS

Simple Instructions and Diagrams for the Home Nurse

For the Application of Principles given here see Arm; Bleeding; First Aid; Fracture; Leg, etc.

Bandages are used to fix on dressings and splints, to give support or to restrain movement, and to arrest haemorrhage. Various forms are employed, e.g., the triangular, the roller, the T-shaped, the many-tailed. Of these the triangular is the easiest to apply and is usually chosen in rendering first-aid.

A triangular bandage is made by taking a piece of calico, 38 in. square and cutting it diagonally across. The parts of the bandage are named, thus the longest border is known as the base or lower border and the others are the side borders. The angle opposite the base is the point and the others are the ends. The bandage may be used as the whole cloth, the broad fold and the narrow fold. If the point is brought down to the middle of the base and the bandage again folded we get the broad fold; folded once again it is the narrow fold. In fastening the bandage the two ends are tied in a reef knot. The diagrams in the next column show the difference between a reef knot and a granny.



The various methods of fixing a triangular bandage or dressing are as follows:

(1) Greater arm sling. This takes the weight of the whole forearm. Use the whole cloth and place one end over the sound shoulder, the point being towards the injured limb. Carry the limb across the cloth and carry the other end over the shoulder on the injured side. Knot off behind the neck; take the point, carry it forward in front of the elbow and fasten with a safety-pin.

(2) Lesser arm sling. This takes the weight at the wrist. Use the broad or the narrow fold and apply as shown in the illustration. The pressure of the knot may be relieved in either sling by placing a folded bandage or a piece of cotton-wool beneath it.

(3) To fix a dressing on the neck, the forearm, and arm. Take the narrow fold, place the centre over the dressing, cross the ends and bring back; then knot over the dressing.

(4) For the thigh and leg use a broad fold and tie as above.

(5) For the elbow. Take a broad fold and place the centre over the point of the elbow. Cross in front and carry round the forearm, overlapping the lower edge of the bandage already applied. Cross again in front and carry back round the arm, knotting over the upper border.

(6) For the knee. Take a broad fold and apply the centre over the knee-cap, then proceed as above, making the knot, however, below the knee-cap.

(7) For the shoulder. Take the whole cloth and lay it on the shoulder with the point upwards. The lower

border is placed opposite the middle of the upper arm. Cross the ends on the inside of the limb and bring back and tie off. Fix a lesser arm sling to carry the injured limb. Take the point first beneath, then down over the sling and pin off.

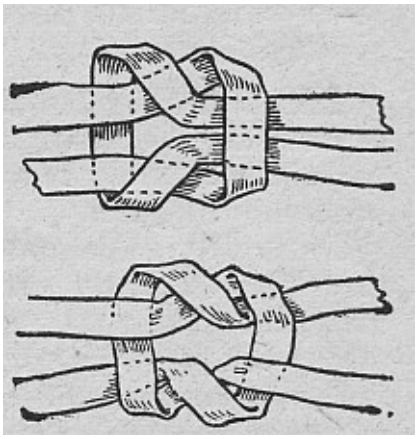
(8) For the hand. Take the whole cloth and lay the hand on it palm down, with the fingers towards the point. Carry this back to the wrist and cross the ends over it. Cross again in front and tie off on the back. Pull the point up and carry down over the knot and pin off on the back of the hand.

(9) For the foot. Place the sole on the cloth, toes towards the point, and proceed as above.

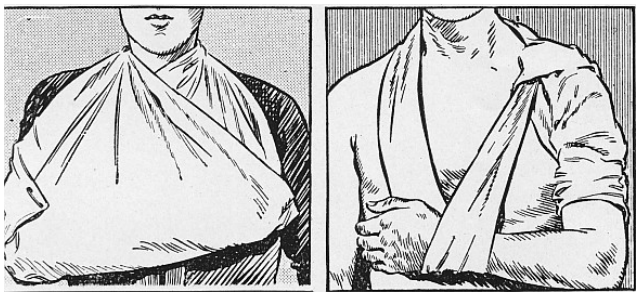
(10) For a wound on the top of the scalp. Take the whole cloth and make a hem on the lower border of about an inch. Place the centre of this border on the forehead over the nose, the point being thrown back over the head. Carry the ends round and cross below the prominence at the back of the head. Then bring these ends forward and tie them securely in front, drawing the point well down under the bandage at the back of the head, carry forward and pin into position.

(11) For a wound of the chest, in front. Take the whole cloth and lay the point over the shoulder on the wounded side. Carry the ends round to the back and tie, leaving one end long; then tie this end and point together.

(12) For the eye. Take a narrow fold and place the centre over the eye. Carry one end obliquely across the brow and the other over the ear. Cross below the prominence at the back of the head, bring forward and tie over the dressing.



Bandage. Above, reef knot, the best to make. Below, granny knot, which is unsafe.



Bandage. Left, greater arm sling: the whole cloth is first placed with one end over the sound shoulder and the point towards and beneath the injured limb. Right, bandage for shoulder combined with lesser arm sling.

The roller bandage may be from one to six inches wide and for fixing dressings should consist of cotton or linen; for binding or splints calico is better; a flannel bandage is very comforting for painful joints. To give support to the legs in cases of varicose veins a woven crêpe or elastic bandage is used.

In bandaging a limb always begin on the inside and unroll the bandage outwards, but do not uncover more than three or four inches at a time. First take a few turns round the limb to fix it, and then proceed upwards obliquely, each turn covering two-thirds of the width of the preceding turn. *(See* diagram above.)

It will be found before one has gone very far that the bandage will not lie evenly, and then it is necessary to reverse. The thumb of the free hand is placed in front of the turn which is being made, the roll is twisted round towards the operator, and the turn is completed with the reverse side of the bandage in contact with the skin. When the bandage comes to the front it is again reversed, and this is continued till it lies evenly without reversing. The first method is the simple spiral, and the second the reversed spiral.

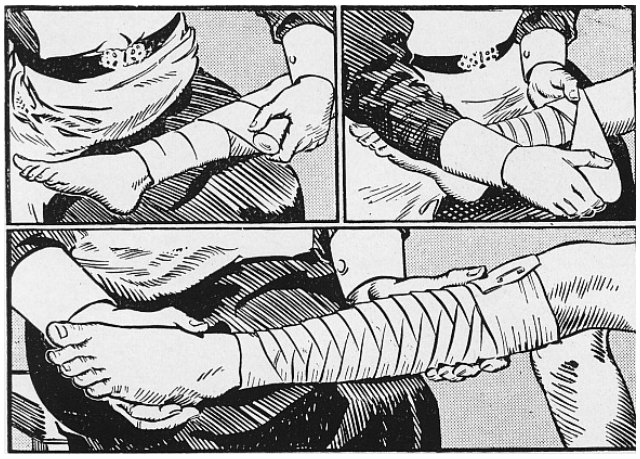
When a joint is reached a turn is taken round the joint, at the knee, for example, across the knee-cap. The next turn overlapping this turn goes below and the next overlaps above, and so on, till the joint is covered in. This is the figure of eight bandage, one loop of the eight being above the joint and the other below. When the bandage is completed it should be fixed with a safety pin.

Certain rules must be carefully observed: Do not apply a damp bandage, as it will shrink on drying and be too tight. Apply the turns with uniform pressure and parallel to each other. Do not reverse over a sharp, bony edge. While bandaging, the nails should be left free, because pressure on them will show whether or not the bandage is interfering with the circulation. In removing a bandage do not roll it up in the process, but before re-applying it. If no bandage roller is available it is possible to roll the bandage quite tightly between the fingers, purchase being obtained by taking it over the back of a chair.

Finger Bandage. To cover a finger, using an inch-wide bandage, take a couple of turns around the wrist, not covering the free end of the bandage, but leaving this loose for tying later. Carry the roll from the inside of the hand over the back of the wrist outwards. After it is firm at the wrist, bring it down across the back of the finger to be bandaged and then make a series of spiral loops, the one overlapping the other, downwards to the tip of the finger, and back again to the root of the finger, thence crossing over the base of the finger and over the back of the hand to circle the wrist in the opposite direction to the point where the end can be easily tied into a knot with the free end of the bandage.

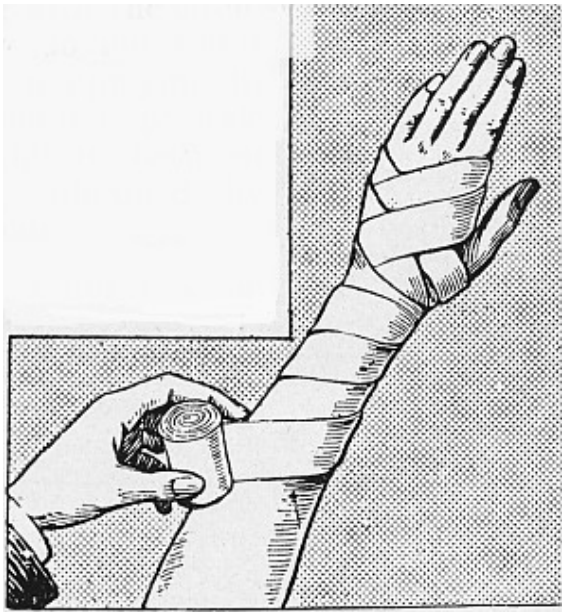
Foot and Leg Bandage. Laying the free end on the back of the foot, the roll is carried around the outer surface of the foot across the sole, up over the inner border of the foot across the instep, round the back of

the ankle, and again over the instep. This figure of eight is repeated, each layer of bandage overlapping the one below by half its width, until the ankle has been passed, and then, commencing from the ankle, spiral turns may be used. At the knee a return to the "figure of eight" may be made.



Bandage. Three stages in the spiral application of a roller bandage to the leg; top, right, shows a reverse being made.

Hand and Arm Bandage. With the arm and hand palm downwards, the bandage is laid across the back of the wrist, the free end towards the patient's body, and kept in position by the operator's free hand. The roll is then carried across the back of the hand from thumb side to little finger side, around the outer side, across under the palm, up through the angle between the thumb and first finger, over the back of the hand, around the wrist and again over the back of the hand from the thumb side towards the little finger side.



Bandage applied to hand and arm in figure of 8 loops and spirally.

Two or three of these figure of eight loops will cover in the hand. A spiral bandage is then continued up the arm, the spiral being reversed when necessary. At the elbow a return may be made to the figure of eight turns, similar to those described above.

Head Bandage. The best head bandage, if no pins are to be used, is the double roller "capelline." This latter is simply a long single bandage, the two ends of which have been rolled up in contrary directions until the rolls meet. If the rolls are of the same size, one should be unrolled about a couple of feet, the slack being taken up by rolling up the other bandage until the two rolls again lie side by side. The surgeon stands behind the seated patient. Taking the large roll in his left hand and the small roll in his right, he first applies the portion of the bandage connecting the two rolls horizontally across the patient's forehead.



Bandage. Use of a double roller 'capelline' bandage for a head injury: one roll is brought round the head and the other across the top.

It is important that the beginning fold of the bandage be low enough on the brow. The two rolls are then brought round, one on each side of the head just above the ears, until they meet well below the prominent back of the head. The left-hand roll is now brought over the top of the right-hand roll, the operator taking it in his right hand, while the other bandage is folded over this and carried forward over the top of the patient's head until below the level of the brow.

The original left-hand bandage, now in the operator's right hand, is continued horizontally around the right side of the patient's head to the forehead, where it crosses over the top of the bandage which has been brought forward over the centre of the head, and i s continued around to the back again. As soon as it has covered over the fold crossing the forehead vertically downwards, this latter is brought upwards, and carried back again over the top of the skull, a little to the left of and overlapping the first strand brought forward. At the back of the head it is again crossed by the horizontal roller, and then is brought forward to the forehead again, this time overlapping the central vertical bandage a little on the right side. The process is continued until the scalp is covered, each horizontal layer serving as a fixation point for the overlapping vertical bandages. When enough backward and forward turns have been taken to cover the dome of the head thoroughly, a few extra horizontal turns may be taken in order to keep the headdress firmly in place.

Thumb Bandage. Begin by fixing the bandage with

a couple of turns around the wrist, carrying the bandage from the thumb side over the wrist, and leaving a free end of five or six inches. After the second turn, bring the bandage down as far as it is necessary to bandage, and make a loop around the thumb here by carrying the roll around the thumb from without inwards, crossing over the back of the thumb and the back of the hand from thumb side to little finger side as the hand is held palm downwards. The roll is again carried round the wrist, and a second loop is made around the thumb as before, this loop overlapping the former and not extending so far down as the first. The loops are continued until the thumb is covered with the bandage from the end joint well up to the wrist, when the bandage is finished off by tying with the free end around the wrist.

BAND-SAW. The wood-worker's band-saw is a comparatively large and heavy machine saw used for cutting flat material into curved shapes. It is used extensively in the cabinet-making and joinery trades. The blade is made of thin steel varying in length from 12 to 24 ft. and in width from ¼ in. to 1½ in. The saw is joined by brazing the ends and forms a continuous band. *See* Saw.

Bangle. A thin bracelet made of metal, glass, ivory, or jade. *See* Bracelet.

Banister. *See* Baluster; Railing; Staircase.

BANKING. Banking accounts are either current or deposit. The latter is only for the investment of money, but a current account is useful even to persons of small means. It enables them to deal easily with cheques, dividend warrants, coupons, and the like. It is a convenience to pay by cheque, which minimises the risk of loss by reducing the amount of ready money a person must have in his house or on his person. Unlike a Treasury note or a coin, a cheque, if lost or stolen, can be stopped and probably traced.

The customers of a bank enjoy other advantages. These include the privilege of depositing deeds and other securities and valuables in the custody of the bank, usually without charge, and that of obtaining drafts on foreign and other banks in case of travel abroad, while the bank will purchase and sell stocks and shares for them. It is useful also for certain purposes to be able to give a banker's reference.

A banking account may be opened by applying to the manager at any convenient branch on production of a reference or introduction. The bank supplies a pass book for recording the customer's receipts and payments. The counterfoils and the book should be compared periodically with the pass book, which is made up by the bank every day and balanced every half-year.

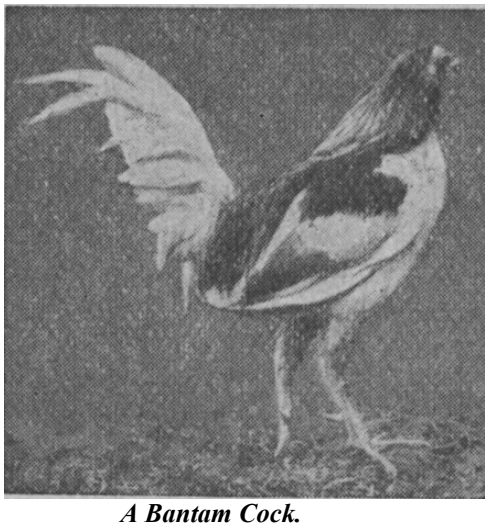
The charges made by the bank vary as between London and the country, and, to some extent, with the nature of the account. Small accounts in London pay from £1 1s. to £2 2s. a year; in the country 2s. 6d. is charged on every £100 turnover. If, however, a certain minimum balance, say £50, is kept in the bank, usually nothing is charged. *See* Cheque; Pass Book.

BANKRUPTCY. Any man may be made a bankrupt, but a married woman cannot, unless she carries on a business or trade. When a husband has lent money to his wife for the purpose of her trade or business, and she is made a bankrupt, he cannot claim for his money until all other creditors have been paid in full. The same holds good when a wife has lent money to her husband for the purpose of his trade or business. The whole of a bankrupt's own property belongs to the creditors except the tools of his trade, necessary apparel and bedding of himself, wife and children to the value of £20.

When a man has made a marriage settlement before his marriage, it holds good against his creditors.

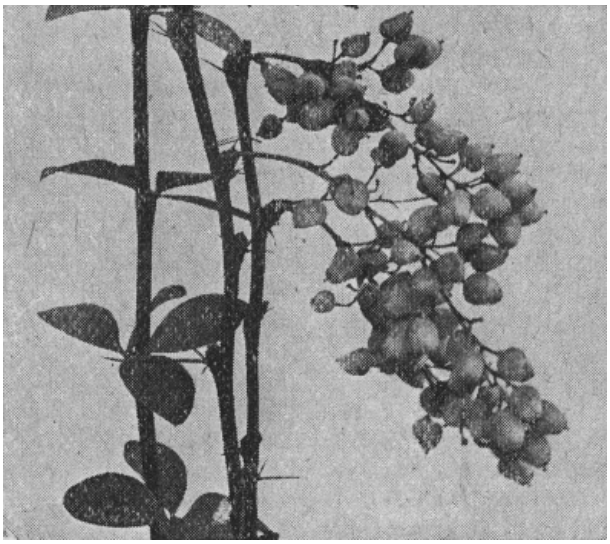
If a man settles money or property on wife or children after marriage, and becomes bankrupt within two years, the transaction is void and the creditors take everything. If more than two but less than 10 years elapse, the creditors still take the money, etc., unless it can be shown that the bankrupt at the time of the settlement was able to pay all his debts without the money or property settled.

BANTAM. Although regarded in many households as a pet for the children and nothing more, the bantam may be made a source of profit. Being the smallest of all poultry, it eats less and takes up less room, but it lays as well as most other fowls. Its egg, averaging 1½ oz. in weight, has a delicate richness of flavour.



A Bantam Cock.

BARBERRY or Berberis. These are hardy shrubs, comprising both evergreen and deciduous species. They thrive in any fairly good, friable ground, and may be raised by seed sown either in autumn or spring, or suckers springing up from the rootstocks may be removed and planted. Cuttings of the ripened wood may be inserted in sandy soil in a frame in autumn.



Barberry. Fruit sprays of a variety of the shrub.

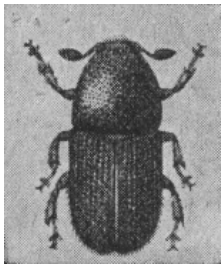
Among the species and varieties of berberis are many of the best hardy ornamental shrubs.

The mahonia (Berberis aquifolium, 3-5 ft.) bears yellow flowers in spring and purple fruits in autumn; it will thrive under large trees and is a good covert shrub. Darwinii, and stenophylla, two vigorous evergreens 8 ft. or more, bear orange yellow and yellow flowers respectively in spring; buxifolia, 8 ft., bears yellow fragrant blooms in April.

In recent years many new barberries, valued for their brilliantly coloured fruits, have been introduced from China, including Wilsonae aggregata, polyantha and dictiophylla. They are invaluable for the front of shrubberies.

The common barberry (Berberis vulgaris) is a large leaf-losing bush or small tree which bears bunches of scarlet fruits in autumn. Candidula is a low-growing evergreen, with purplish fruits, and suits a rock garden (q.v.).

BARK. The exterior covering of trees has many uses. Bark can be removed from a tree-trunk by cutting round the tree with a sharp knife or saw. A second cut is made below the first, and the two cuts joined by a vertical cut. The bark can then be peeled off. Coloured barks are employed effectively as coverings for the walls and roofs of summer-houses and similar outdoor structures. The variety of bark known in the trade as virgin cork has a rough surface not unlike rock, and is used to some extent in building up internal ferneries and such-like greenhouse fitments. It is preferable to wire this material to the wooden framework. *See* Summer House.



Plum Bark beetle, much enlarged.

BARK BEETLE. The fruit-tree most often damaged by this insect is the plum, but the beetles are also found on apple, pear, cherry, apricot, peach, and quince. In the case of an infested plum-tree it will usually be noticed that some of the twigs or smaller branches are dead, and that numerous holes have been bored through the bark, which peels off easily, disclosing little tunnels between the bark, and the wood of the tree. The trouble may extend to the larger branches and even to the trunk itself, and the entire tree may thus be killed.

The adult beetles are brownish-black insects about one-sixteenth of an inch in length. During warm weather in spring the beetles leave their burrows, flying away in search of fresh trees to attack. On discovering a suitable tree the female selects a twig or branch and bores a hole vertically through the bark. It then turns and bites out a tunnel or brood chamber ¼-½ in. in length along the branch between bark and wood, laying eggs as it goes. This information is given by the Ministry of Agriculture (Leaflet No. 159). *See* Plum.

The measures to be adopted are preventive rather than remedial. Trees in an unhealthy state are preferred by the beetles, and a bad attack by aphides or brown rot on plums, for example, may cause an increased infestation by bark beetles. Therefore all dying and badly damaged trees or branches should be cut down and promptly burned.

BARLEY. Pearl barley is the grain deprived of husk and pellicle and rounded and polished by grinding. Pot or Scotch barley is more nutritious than pearl barley, being deprived of the outer husk only, and roughly ground.

Barley is valuable for thickening soups and broths, for making puddings, and for the preparation of barley-water. It contains no gluten, and therefore is not suitable for bread-making, except with a slight admixture of wheaten flour. It unites well with the oily matter extracted from meat in boiling. If soaked overnight in sufficient cold water to cover, it needs less time to cook.

For a nutritious barley stew, take 1½ lb. of boneless shin of beef or ox cheek. Wash and wipe this, then cut into large pieces and place it, in layers, in a saucepan, casserole or stewing jar, with two large sliced onions, some carrots, and 1 gill of soaked Scotch barley. On the top of the last layer arrange 1 lb. of washed, peeled, and thickly sliced potatoes. Season two quarts of cold water and pour this over the mixture until the saucepan is three-parts full. Then cover and stew slowly on the fire or in the oven until tender. Small suet dumplings and well-cooked cabbage should, be served with this dish. Mutton may take the place of beef, but the gravy will then be less rich.

BARLEY CREAM SOUP. Melt 2 oz. butter in a saucepan and stir smoothly into it 1 oz. flour; then add a pint white stock and stir it with a clean wooden spoon until boiling. Put into the mixture 1 oz. washed pearl barley, simmer till the latter is soft, which will take about 1½ hours, and rub all through a hair sieve. Rinse out the pan, pour back the sieved soup, and

simmer for 5 minutes.

Allow the mixture to cool for a few min., and then strain into it the beaten yolks of eggs and 2 gills milk or cream. Add seasoning and reheat the soup; it must not boil or the eggs will curdle. Serve in a hot tureen with fried croûtons. If no white stock is available use a mixture of half milk and half water, to which a small piece of onion has been added. Margarine may take the place of butter. Sufficient for about four persons.

BARLEY MEAL. A mixture of flour and barley meal is sometimes used for scones or home-made bread. Mix well 4 oz. each of flour and barley meal, ½ teaspoonful each of salt and carbonate of soda, and 1 teaspoonful of cream of tartar. Rub in lightly and finely 2 oz. of butter, and mix with about 1 gill of milk to as soft a dough as possible without making it actually sticky.

Having kneaded it lightly on a floured board, form into a thick round and cut across into four or eight pieces, taking care not to cut right through to the board. Place the round on a floured tin, brush over with milk to gloss, and bake in a quick oven for from 15 to 20 minutes. The scones should be broken (not cut) apart, and served hot, split and buttered. They can be baked on a hot, greased girdle if preferred. Sufficient for eight scones.

For barley meal cheese mix two heaped tablespoonfuls of barley meal with a little cold milk until smooth. Boil the rest of a pint of milk and stir in the barley meal. Cook for ten minutes, then add two tablespoonfuls grated cheese with some made mustard, and salt and pepper to season. Put the mixture into a pie-dish and brown in the oven.

BARLEY SUGAR. Put 1½ lb. of loaf sugar into an enamelled saucepan, add ½ pint of water and half the beaten white of an egg. Mix well together and then bring to the boil and skim carefully. When scum ceases to rise the sugar is clarified, but it is as well to strain through muslin. Put back in the pan and boil to the crack, i.e. so that a little dropped into cold water becomes hard and brittle. Remove from the fire, add a teaspoonful of lemon-juice, and after letting it stand for a minute or so, pour out on a greased dish. Before it sets hard, cut into strips and twist.

Barley sugar is one of the healthiest sweets for children, being rich in glucose, which counteracts any tendency towards rickets. Far better than cane sugar as a digestive, it is strongly recommended by doctors, and very cheap to buy or make.

BARLEY WATER. Wash 2 tablespoonfuls of pearl barley in cold water, put it into a saucepan with 2 pints of cold water, bring to the boil and boil gently till the liquid is reduced to 1 pint. Strain, and sweeten or salt according to taste. One cupful of this, added to one cupful of milk, hot or cold, makes a pleasant invalid drink, and for infants the barley water is used in the same proportion as water in their milk allowance.

For large quantities of barley water as a wholesome drink make as above, adding to every pint, while hot, the juice of half a lemon and one tablespoonful of sugar. This beverage seems to be growing fashionable as a "soft drink" for teetotallers at parties, rivalling grape-fruit squash and tonic waters. Thin people, who want to put on weight should drink at least a quart a day. Barley water should be freshly made each day, and kept in a cool place.

To make Imperial Drink add 1 teaspoonful of cream of tartar to 1 pint barley water while hot. This is used in febrile conditions and to stimulate the action of the kidneys.

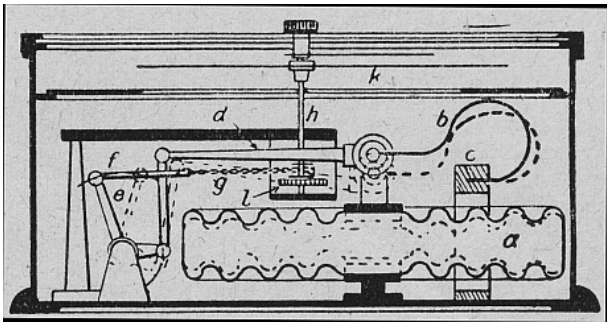
Barm. *See* **Yeast.**

BAROMETER. Mercury barometers for measuring weight or pressure of the atmosphere are not to be confused with the aneroid instrument, which arrives at the same result by totally different means. A barometer such as the Fitzroy consists of a large-bore glass tube about 3 ft. long, filled with mercury, and inverted into a vessel also containing mercury. This allows the mercury to descend a few inches, thus causing a vacuum at the top.

The surface of the mercury in the container is subject to atmospheric pressure. Hence, as the air pressure increases, the column of mercury is forced up the tube. Conversely, as the air pressure diminishes, the mercury column falls proportionally to the atmospheric pressure at the time. The average height of the top of the mercury column from the surface of the mercury in the vessel at the bottom is about 30 in. By arranging the tube so that the top of the mercury is visible it is possible to add a scale and take readings direct.

In general principle this system is used in the Fitzroy, Piesmic, Cistern, and Fortin barometers: the last mentioned is largely employed for observatory purposes. In other types a small float on the surface of the mercury is attached to a cord passed over a drum on an axle provided with a pointer, from which readings are taken on a suitably graduated scale.

Important points to remember with any mercurial barometer are to keep it always perpendicular and to hang it in a position where the temperature is equable, otherwise it will act as a thermometer.



Barometer. Aneroid barometer shown in section. Explanatory details are given in the text.

Aneroid Barometer. The aneroid differs from the

mercurial barometer in having no long glass column to get broken, nor any quicksilver to get lost. Also, it works anywhere and in any position. On the other hand, it depends on metal springs, and is, therefore, affected by changes of temperature, so that it requires to be checked from time to time by comparison with a good mercurial instrument in the neighbourhood or on about the same height above the level of the sea.

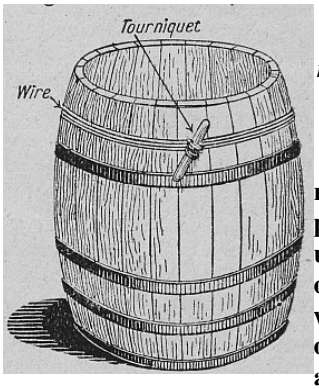
In the illustration, which is a section, *a* is a thin metal box with the top and bottom corrugated to make them more springy. This box is partly exhausted of air, so that the effect of the atmospheric pressure is to force the top and bottom inwards. A strong curved spring, *b*, is attached to the top of the box at one end and at the other to a fixed stand, *e*, and connected by the lever, *d*, to a bell-crank, *e*. The other end of this crank has another lever, *f*, attached; it joins a fine chain, *g*, which is wound round the spindle, *h*, of the pointer, *k*. A hair-spring, *l*, controls the movement of the spindle and keeps the chain taut.

The dotted lines show the movement in an exaggerated form. In the dotted line position the atmospheric pressure is high, and the box is compressed in consequence; lever *d* has been drawn down, the bell-crank pulled over, and the hair-spring has wound the pointer round several degrees on the dial in a clockwise direction. When the pressure falls the reverse action takes place, and the chain, *g*, pulls the pointer back.

BARONESS PUDDING. Take equal quantities of flour, suet and raisins; ½ lb. of each makes a good-sized pudding for four or five persons. Add a pinch of salt and make into a stiff dough with milk. Steam in a greased bowl covered with greased paper for three hours. Serve with jam or sugar.

BARON OF BEEF. A joint consisting of two sirloins left uncut at the backbone is called a baron of beef. This cut is now seldom used. *See* Beef; Sirloin.

BARREL. This is a cylindrical wooden vessel made of curved staves bound together with hoops and used for holding beer, tar, and other liquids. A barrel is also a measure of capacity, varying according to the liquid measured. A barrel of beer contains 36 imperial gallons, a barrel of oats equals 14 stone, and a barrel of tar equals 26 ¼ gallons.



Barrel. Leaky barrel mended by tightening staves with wire.

When they are no longer required for trade purposes, barrels can be utilised in various ways in or around the house. A port wine pipe set up on legs or on a small platform serves as a rainwater-butt. It should be coated inside with tar, which is then set on fire and burned out. A second coating of tar is given, and after the exterior has been painted, the barrel is ready for use.

The charring and tar treatment preserves the wood from rotting. A draw-off tap near the bottom and overflow pipe at the top and a lid to exclude dust and dirt are desirable additions.

When barrels have been left lying about for some time the staves generally become slack; they can be tightened by driving the hoops further down the barrel, or by wiring them tightly. The wiring is done by twisting several turns of 1/16 in. diam. (16 gauge) galvanised wire round the barrel and tightening it up with a tourniquet. Secure the wire with clout nails, or by cutting a shallow groove for it to lie in, to prevent it shifting from its place.

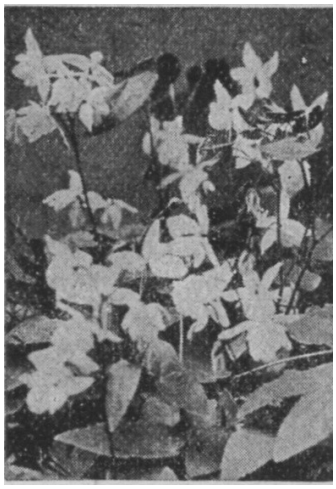
To clean old barrels, wash and scrub them with caustic soda solution, or use one of the paint removers.

Tapping a Barrel. Barrels may be tapped by first setting the cask in such position that nothing will be lost during the process. Then remove the plug in the hole intended to receive the barrel tap. Wrap a piece of paper around the stem of the tap and drive it home tightly with a mallet. Set the cask in position with the tap to the bottom, drive the air release peg into the barrel, or preferably withdraw it if possible. The contents can then be drawn off by turning on the tap.

BARREL: In Gas Fitting. The trade name of barrel is given to wrought iron tubing used for gas and hot water pipes and similar purposes. Such tubes are made in three thicknesses or weights, according to the size of bore, and are butt-welded. The lightest and commonest class is used for gas fitting. Hot water pipe is stronger and of superior quality, and is usually tested to withstand a pressure of 300 lb per square inch. Steam barrel is superior to water barrel, and withstands 500 lb. per square inch.

There are many uses for such tube apart from their specific duties. Numerous fittings, such as angles, tees, and junctions, are avail able, and by their use a large number of articles can be produced by the home worker. Gas and steam barrel is measured by the bore or diameter of the hole. Thus ¼ in. gas pipe has ¼ in. diameter hole, and actually measures approximately ⅜ in. diameter on the outside. Gas barrel is connected by means of a screw thread cut on the exterior of the tube, two straight lengths being connected by a screwed socket or sleeve, screwed over the outside of the barrel. *See* Gas Pipe; Pipe; Tubing.

BARRENWORT. This is a hardy herbaceous perennial, equally attractive in leaf and bloom. The foliage, somewhat like that of a begonia, in autumn colours well; it gets dingy later, but should be left on through the winter to protect the buds. It is a spring-flowering plant, bearing yellow, white, blue, or violet flowers. The height of the different species varies from 6-18 in.



Barrenwort, a hardy perennial somewhat like a begonia.

The barrenworts grow best in shade, especially in cool, peaty soil, or in a mixture of peat and loam. They are very useful for shady rockeries, and will thrive under trees. Propagation is by division in spring, or by portions of the rhizomes which will form plants if put into gentle heat in spring.

BARROW. A barrow is an article used for conveying goods. The commonest form of it is that more usually known as a wheelbarrow, but there are also hand-barrows without wheels. *See* Wheelbarrow.

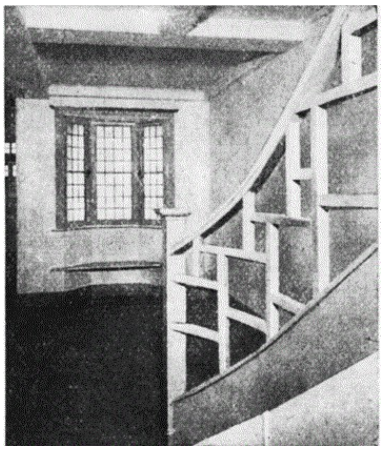
BARTONIA. Growing about 15 in. high, the bartonia is a hardy annual with deeply cut, toothed, greyish leaves and large bright yellow flowers showing a mass of prominent stamens resembling those of the wild dog-rose in shape. It thrives in ordinary soil, the seed being sown in September for spring flowering, or in spring for blooming in late summer. Pron. Bar-tony-er.

BASEMENT. A basement is the lowest floor of a building when it is situated below the ground level and when access to it is attained by steps outside or inside the building. The term half-basement is used when the ceilings on such a floor are above ground level.

There are various sanitary, hygienic, and other objections to basements, and modern houses are built without them. In large buildings, where mechanical ventilation can be installed, there is less objection to them.

The decoration of basement living rooms and flats requires careful consideration of wall treatments, artificial lighting and window curtains. Semi-glossy paints are helpful in pale, warm colours, avoiding dead white even for ceilings as uncomfortably harsh. Patterned papers should also generally be avoided, but a distinctive note can be given to plain wall surfaces by the use of colour for woodwork; thus a pale buff plastic paint may have coral enamel, a primrose yellow distemper, amber painted skirting and door. Mirrors can be used to advantage in dark rooms and give an effect of space. Wall lighting, which can be both brilliant and yet diffused, is the best substitute for daylight. Where possible reflectors may be placed outside windows. In the case of bay windows the inner sides of the bay may be panelled with looking glass.

Window curtains may be of light, bright surfaced materials. Pelmets, if used, must be designed not to obscure light. Curtain rods should extend on either side beyond the window frames, so that curtains may be well drawn back. To hide out basement views somewhat, straight French net inner curtains with a light all-over pattern may be used completely to cover the windows. *See* Area; Cellar; Flat; Mirror; Window.



Basement. Part of an ingenious and decorative conversion of a basement into a flat.

BASIC SLAG. This is a valuable chemical manure, its worth depending on the percentage of phosphate of lime which it contains. As influencing the availability of the phosphate, the fineness of grinding is extremely important. Basic slag is slow in action and must be applied in autumn. It is beneficial in fruit, flower and kitchen gardens. *See* Manure.

BASIL. Two species of this potherb are generally known, sweet and bush basil. They are nearly allied to the mint (Mentha) family and their scientific name is Ocymum. The sweet basil grows about 12 in. high, and is densely covered with small oval leaves. The little white flowers appear in early summer and are borne in long clusters. The bush basil grows about half the size, forming a roundish bush. Both plants are highly aromatic. They are annuals and are easily grown from seed in spring. They like a light, sandy, friable soil.



Basil. Spray of sweet basil, an aromatic pot-herb.

The tips of the leaves are used to impart their distinctive clove flavour to soups and salads, and are also used for seasoning. By cutting down one or two plants as soon as they come into bloom, and drying the leaves slowly in the shade, the leaves can be used in the winter. A form of bush basil is sometimes grown as a pot-grown as a pot-plant for a greenhouse or window. It bears shining green leaves, and pale pink flowers. Pron. Baz'-il.

Basil. *See* Leather; Sheep-skin.

BASIN. Cooking basins are made in enamelled ware and aluminium as well as earthenware. The former have advantages, being light, unbreakable and easily cleaned.

Good quality enamel-ware is essential, as inferior enamel is liable to contain arsenic, easily, fragments of the coating getting mixed with the food.

To minimise the danger of chipping delicate china, glass, etc., when washing it, papier-mâché basins might be used with advantage. Clean them with a soft rag dipped in paraffin if marked and stained, and rinse well in hot water and dry. Mixing basins should be 11 or 12 in. across. These are useful sizes.

Pudding basins differ from the ordinary bowl, on account of the deep rolled rim intended to prevent the string used for tying on the pudding cloths from slipping upwards. These basins can be obtained in sizes from 3 to 12 in. across. Pudding basins with special covers obviate the need of pudding cloths. Spouted or lip-basins are handy, as milk, stock, etc., can be easily poured from them. *See* Aluminium; Crockery; Enamel.

BASKET MAKING AND REPAIRING

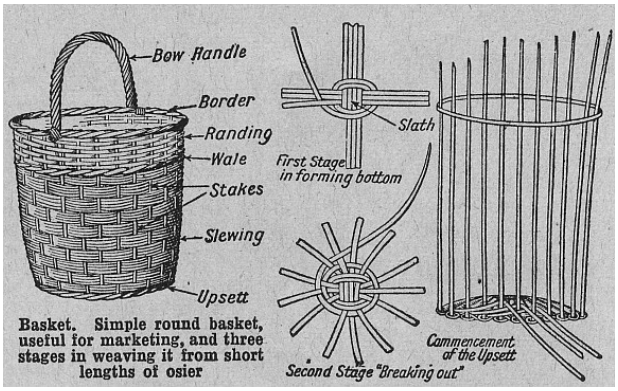
How to Practise Simple Weaving with Osiers

Other Varieties of Basket Work are described under Linen Basket; Raffia, etc.

Basket making may be carried out with the aid of a few simple tools, and although elaborate baskets require skill in manipulation simple work may be produced after learning a few of the methods of weaving the rods.

Most baskets are made with osiers worked up with the bark intact; others are made with rods from which the bark has been removed, and either left white or stained to a buff colour.

All osiers must be thoroughly soaked in water before use, in order to render them sufficiently pliable for bending. Round baskets may be made with no other tools than a knife and bodkin, but for square-sided work a screw-block is required to hold the stakes whilst weaving. A simple round basket embodies the principal methods of weaving, termed strokes. Such an example is shown, which can be used for marketing purposes. Short lengths of osier may be used; either the sizes known as luke and small in brown osier or tack and long small in white and buff will be suitable.



Basket. Simple round basket, useful for marketing, and three stages in weaving it from short lengths of osier

The bottom should be commenced by prearing six 12 in. lengths cut from the thick ends. For the first stage these lengths must be tied together in two sets of three as shown in the illustration, but as there should be an uneven number of spokes, a whole rod should be used to provide the extra spoke, and also the material for binding the lengths together. The long rod will rest with its thick or butt end alongside one of the sets, and the remainder must be carried over and under the crossed lengths until it has been twice round.

The next stage commences the separation of the spokes, and the weaving of the rod is continued, first under and over each length until it is used up. Care must be taken to bend the spokes evenly and to work the weaving length as closely to the centre as possible. Having once singled out the spokes the suc-ceeding work is quite straightforward, and only needs care in keeping the weaving rods close up as each round is finished. New rods are started two spokes back and left projecting about 1 in. beyond the top of a spoke, or the end may be pushed down alongside one of the spokes and then bent out. When a diameter of 9 in. is reached the end of the weaver should be cut off and pushed down alongside the nearest spoke, and the projecting ends of the spokes cut off close to the weaving.

The natural tendency in weaving will be to form a hollow tray, and this is just the formation required. The sides should now be formed by inserting the stakes, which are long lengths sharpened at the butt end, and pushed in alongside. It is still necessary to have an odd number of rods, so, as there are 13 spokes, 25 straight rods should be trimmed at the ends with a slicing cut called a slype. Each rod should be pushed down by the side of a spoke, a hole being prepared if necessary with the bodkin, and the single rod placed at the point where two spokes are closest together. The bottom must be placed flat on a table with the crown uppermost, and each spoke turned upright. If the osiers have been properly soaked, and the point of the knife is dug slightly into the angle of the bend this can be done readily enough. The tops should be gathered together and placed in a hoop, as shown.

The next stage is known as the upsett, three rods being worked round the stakes to stiffen them. Sharpen three rods and push the first alongside the single stake and the next two following. The three are now worked together, each one being carried in front of two spokes and behind the third, taking them in order, and continuing until they are used up. This should be done as tightly and closely as possible, working down on the corner in order to give a firm foundation to the succeeding work.

Three Methods of Weaving

The quickest way of filling up the sides, known as slewing, consists of three or more rods worked in and out all the way up, new lengths being taken as required, and each length started with the top or thin end. The used end is left projecting on the inside and cut off later when the work is dry. The slewing should

be continued to a height of 5 in., and the rods worked out to leave the top level; if necessary short lengths of osier can be worked in in order to obtain the required level.

A band termed a wale has to be worked round the sides. Pick out four thin rods of medium length and, commencing with the tops, place them behind four stakes in order, and then carry them alternately in front of three and behind one, until the round has been completed and the commencing ends covered. The result of the work will be seen in the stiffening of the weaving. A single rod weaver should be worked, adding others to bring the sides up to the height of 8 in. This method of weaving is termed randing. The top should be left level, and if the weaving has been carefully done all the upright stakes will be equally spaced all round.

The sides are now ready for the border, which may be quite simple or full. The simple border is formed by bending each stake down in turn, and carrying the bent top in front of the first on the right, behind the next, and left outside the third, the ends being trimmed off a little beyond the stake they rest against.

For the full border, commence by laying down four spokes, the first behind the second, and left in front of the third; the second is taken behind the third and left behind the fourth, the third behind the fourth, and left behind the fifth. The fourth stake is taken behind the fifth together with the end of the first one laid down, the fifth stake is worked together with the second laid down, and so on until the complete round has been worked, the last four stakes being worked together with their corresponding ends underneath the bends of the first four. The projecting ends which are now on the outside of the border are trimmed off quite close to the border, when the work is dry.

The handle is formed from a stout length of rod, and bound in position with lengths of osier. A rod is cut to a length of 30 in., with both ends sharpened. One end is driven down through the border to a depth of 6 in. alongside of the stakes. The rest of the rod is carefully bent, and the other end driven through the border alongside a stake on the opposite side. The plain bow may be covered with a double spiral formed by driving the sharpened end of the rod each side of the handle. The rods should be wrapped round and the ends worked across and through under the border on the opposite side in each case.

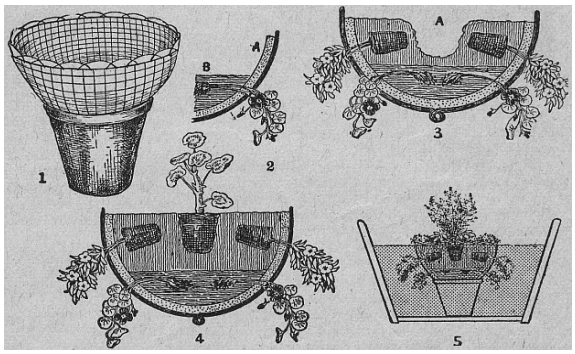
The basket should be finished by cutting off all the projecting ends left inside, but as the rods shrink when dry, sufficient should be left to prevent the end slipping past the stake on which it rests.

Basket Repairing. The handles of clothes baskets are formed with two thoroughly soaked rods which are driven through the border alongside suitable stakes. The ends should be driven down as far as possible. Bend the rod on the left and pass the top under the border from the outside alongside the rod on the right and pull it right through to form a bow. Now twist the second rod on itself and carry it in the form of a spiral three times round the bow, carry it under and through the border and return to the commencing side and repeat. The end of the first rod can be treated in the same way, and this is continued until the bow is filled up. The same method may be followed in re-covering a large bow handle when the covering is broken.

The bottom rim of both square and round baskets can be strengthened by driving in, alongside the upright stakes, a number of single stakes, endeavouring to get them as far through the weaving as possible. The upright ends are treated much in the same way as a border, each rod being carried down behind the next, in front of the one following, and left either behind the next or in front of the next but one. When the ends are cut off, the new rim will form a solid foundation to the old work.

BASKET BALL. Game played, especially by girls, on a stretch of ground between goals, which consist of a net shaped like a basket. It thus resembles net ball (q.v.).

BASKET PLANTS. The culture of plants in baskets is a great convenience to the amateur who possesses only a small greenhouse or conservatory. The baskets are usually made of galvanised wire, wood, or terracotta.



Basket plants and methods of arranging them. 1. Basket placed on flower-pot for convenience in planting. 2. Section of portion of basket: A, moss lining; B, rough soil for base planting. 3. Side plants in finer soil, leaving space, A, for centre plant. 4. Section of basket with plants in position. 5. Correct method of watering by immersing basket in a tub.

The number of kinds of plants available for basket culture is very great. The following may be named as suitable. Achimenes, asparagus fern, begonia, certain of the campanulas, buttercup oxalis, clianthus or glory pea, Cornish moneywort, fuchsia, ivy-leaved geranium, ivy-leaved groundsel, ivy-leaved toadflax, Cape cowslip, lobelia, mother of thousands, nasturtium, petunia, and thunbergia.

Wire baskets are best for ferns, and should be lined with moss. In hot weather the baskets should be dipped in soft water twice a day. Two parts fibrous loam, one part rough peat, one part leaf-mould, and sand make a suitable compost. The plants should be put into the baskets in spring. A well-grown plant—one, say, turned

out of a 5 in. pot—should be put in the centre, leaving the crown just above the top. An old plant should be divided into a dozen or more young plants, and these should be planted round the edge of the basket, as shown at 3 in the diagram above. Several kinds may be arranged in one basket, the small being inserted in the sides, the fronds pointing downwards. A large kind should occupy the centre. *See* Flower Basket.

BASQUE. That part of a bodice to which the waist is sometimes fitted, extending downwards from the waistline. A basque may be cut on circular lines, or it may consist of two straight pieces, one attached to the front and one to the back of the bodice, with openings at the side seams. *See* Blouse.

BAS RELIEF. The decoration of a modern house often includes some form of bas-relief in the frieze or ceiling of a room. The most common material is anaglypta, or one of the other variants of fibrous plaster. Modern fibrous plaster, which, with gypsum as a basis, sets into a hard cement, is quite durable enough for ordinary purposes.

The depth of the relief should depend upon the size and height of the room. In small rooms the relief should rarely exceed ½ in. to 1 in. in depth. *See* Anaglypta; Moulding.

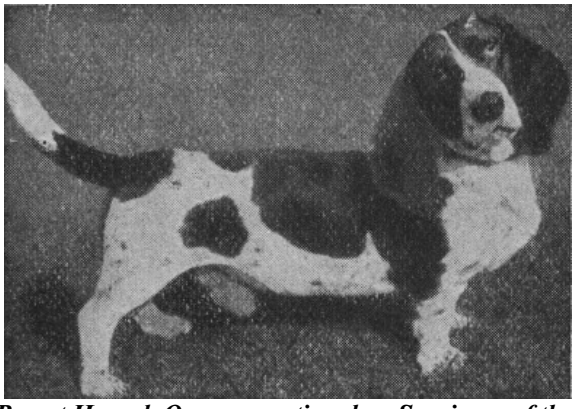
BASS: Cooking the Fish. To bake, wash and clean one or two medium-sized fish, placing a little butter or dripping inside each, and seasoning to taste. Lay on a greased baking-tin, smear with more fat, and bake in a slow oven for a little less than half an hour, basting occasionally. Cut some potatoes into neat pieces, and when partly boiled put them into the baking-tin with the fish, and cook for 10 min. or so. When done, arrange the fish on a hot dish with the potatoes placed round and garnish with finely chopped parsley. If liked mustard sauce may be served separately.

Bass may also be stuffed. Take a fish weighing about 4 lb., wash and clean, and season it inside with salt, pepper and lemon juice. Then stuff with oyster forcemeat, sew the fish up, and lay it on a greased baking-tin, squeezing some more lemon juice over it, and placing a few thin slices of fat bacon on the top. Bake in a hot oven, basting occasionally with the fat. When cooked, place the fish on a hot dish and draw out the trussing thread. Sprinkle with parsley and cut lemon, serving with it tomato or any other suitable sauce separately. It is sufficient for seven or eight persons.

BASS: A Useful Wood. Bass or basswood comes from the lime, but more usually from the tulip tree of N. America. Alternative names are American whitewood, American poplar, tulip wood, and canary wood. It is a soft wood, usually light yellowish-green in colour, is obtainable in large sizes, and is often used instead of pine for furniture, panels, boxes, pianos, toys, and carving. Bass is as straight in grain and as free from knots as pine, and slightly harder. It takes stain and polish well, the usual stains being ebony or walnut. *See* Wood.

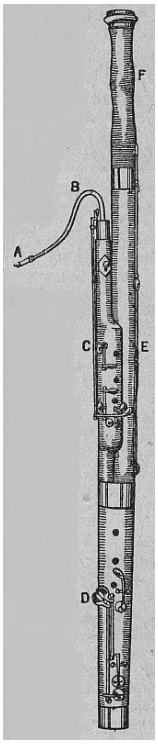
BASSET HOUND. Originally a sporting dog, the basset hound is now kept more as a companion than for hunting hares. So far as head and body are concerned the basset is a full-sized hound, but it stands only 9 in. to 12 in. at the shoulder. The legs are so short that the deep chest almost brushes the massive fore-paws. The ears are very long.

The dog weighs from 40 lb. up to 45 lb.; the bitch rather less. There are two types of basset—the rough, with a harsh, profuse coat variable in colour, with a dense undercoat; and the smooth, with a short, fine, and glossy coat of black, white, and tan colour. It is good-tempered and affectionate. *See* Distemper; Dog.



Basset Hound. Once a sporting dog. Specimen of the smooth-coated variety.

BASSOON. An instrument of extensive compass, the bassoon possesses a beautiful tone, and is so useful in an orchestra that competent players are always in request. To fit the separate parts together, the reed is put into the narrow end of the crook, the broader end of which is inserted in the wing. The wing and the bass-joint are then placed side by side in the holes at the top of the double-joint, and finally the bell is put on. The instrument is held transversely across the person, sloping from the left shoulder to the right thigh. A strap round the neck takes the weight of the instrument, which lies in the hollow of the hands, the left being the higher of the two. The reed is taken into the mouth, but it must not come into contact with the teeth. The beginner will be wise to get at the outset a few lessons from an experienced person regarding the embouchure, the fingering, and other elementary points.



Bassoon. A. Reed. B. Crook. C. Wing. D. Double Joint. E. Long Joint. F. Bell.

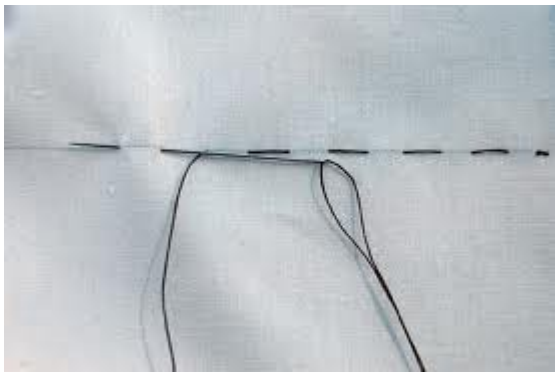
A good instrument ought to last for many years, but this is conditional on scrupulous cleanliness. After use the interior (particularly of the wing) should have a soft rag passed through it. All tone holes should be kept free from dirt, again with a soft rag. Keep the joints clean, greasing them if necessary to prevent moisture working in and thus causing splitting. The crook should be occasionally washed in hot water. Should the blow hole become clogged, free it by using carefully a soft brush or a fine needle. Reeds also should be gently wiped and put in some warm place to dry after use. The instrument should be kept in a dry but not over-warm place, protected from dust.

BAST. This is the fibrous material used for tying up bunches of cut flowers, and also for keeping in hand wayward branches of straggling perennial plants. The fibre, which is very tough, is the dried and dissected stem of the hardy perennial Scirpus, allied to the bulrush and rush grass. *See* Raffia.

BASTING: A Cookery Term. A long basting spoon is used so that the oven door need not be opened wide enough to let in cold air. The juices out of the meat, etc., collecting in the baking-tin are allowed to drip from the spoon over the article that is cooking. This prevents burning and improves the flavour.

Basting ladles, being round, are convenient for dipping into baking-tins made with a well in one corner, in which the dripping is able to collect. *See* Baking; Roasting.

BASTING: In Dressmaking. Tacking employed to hold two thicknesses of material together before joining the seams. Begin with a knotted thread, the knot being on the top of the work so that the basting threads can afterwards be easily pulled out. Always bring the needle out ¼ - ½ in. beyond where it is inserted, and make each stitch even. Finish off with two stitches on top of each other and leave an end of thread to avoid pulling the whole of the basting out by accident. *See* Dressmaking.



Basting stitch showing how he needle should be inserted slantwise.

THE BATH: HOW TO FIT AND CONNECT IT

Installation Methods in Houses both Old and New

For Fittings and Arrangements see Bathroom; other associated articles are Boiler; Enamelling; Geysers; Plumbing; Water Supply, etc.

Before fixing a bath in a house it is necessary to know exactly the location of the water supply, rain-water pipes, and gullies or drains required to take away the waste. If the room is in a basement, a waste-water gully must be available; if it is on the ground floor, then it is necessary to ascertain the difference in level between the floor of proposed bathroom and the level of the ground outside, and of the gully to be used for the bath waste. The waste pipe must have a continuous fall from the bath outlet to the gully, and this must not be less than 3 in. in 10 ft., and preferably more.

On upper floors it is customary to pass the waste into a rain-water head, or to fit a separate down pipe of cast-iron of at least 2 in. diameter, and having a head on the top and a shoe or bent nozzle at the bottom, in both cases delivering the waste water into an open-trapped gully. The local building by-laws may require certain arrangements of the pipes, particulars of which can be obtained from the district surveyor, but generally all require the overflow and waste pipes to discharge through the heads and into gullies in the open air and be easily visible.

In the great majority of houses the bath is made of cast-iron; the best kinds are covered with a vitreous enamel, giving the porcelain appearance so much liked, and a surface which will resist acids, enabling it to be easily cleaned and kept in sound condition. The bath should be fixed in such a way that every part, underneath, at the sides or ends, can be easily got at and cleaned.

Practically only two shapes of bath need be considered; these are known as the taper bath and the parallel, according to whether they narrow towards one end or not. Where sufficient room and adequate hot-water supply allows of the parallel bath, it is of great advantage, giving the highest comfort in use and a decidedly better appearance. The best size for a bath is 5 ft. 6 in. long, and the roll edge should be not less than 3 in.

The position of a bath in a room is of great importance. It should be quite clear of the walls at the sides and ends, so that there is no difficulty in being able to clean and dust all round it. It should also be raised from the floor with wooden supports, if the legs are not long enough, to permit of sweeping under it.

If a geyser is fitted a good ventilation pipe must be attached to carry the products of combustion to the outer air. A baffler should be fitted into the ventilation pipe to prevent a back draught into the room. All vent pipes, elbows, and the baffler must socket inwards, that is, towards the geyser.

All geysers, of whatever type and however heated, are unsafe unless provided with a ventilation pipe.

As to hot-water supply, baths hold from 30 to 60

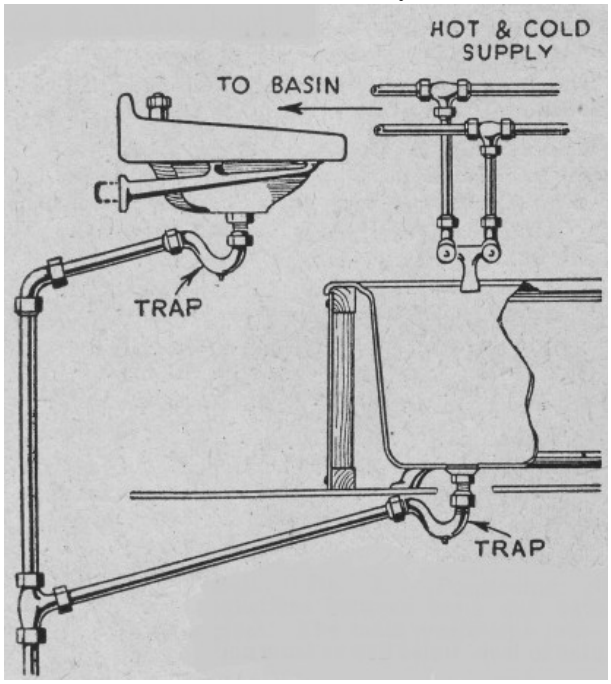
gallons of water, and from 8 to 10 gallons of very hot water are needed for a hot bath. If an efficient system is already installed, this can be tapped to supply the bath, otherwise a geyser is the easiest and probably most efficient to instal, requiring only the one cold- water supply pipe, with a branch to the bath. *See* Hot-Water Supply.

The bath must be placed so that its foot is as near as possible to the wall through which the waste-pipe will be carried. Incidentally, this will facilitate the fitting of a geyser, if required, for it is essential that a ventilation pipe should be attached to a geyser (q.v.).

Careful consideration should be given to the run of the pipes. In the absence of a thoughtfully prepared plan there is likely to be unsightly confusion of them which will seriously militate against the tidiness of the bathroom's appearance and impede cleaning operations. The general aims should be to have them coming up from the floorboards closely under their points of termination, to keep them short and straight and neatly paralleled and right-angled wherever possible.

Since wiped lead joints are beyond the skill of the handyman it is suggested that light-gauge copper tubing with simple compression joints be employed.

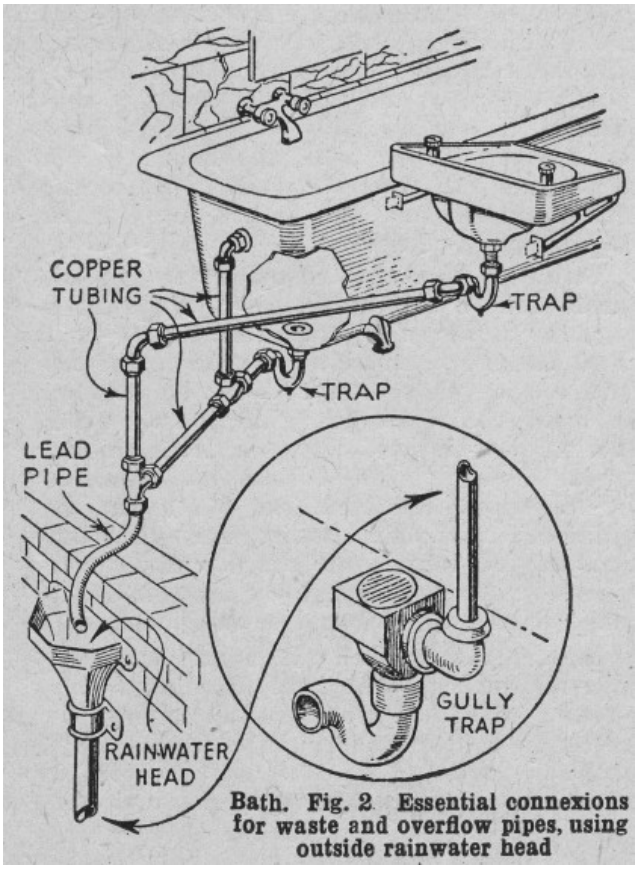
The positioning of the junctions between the hand-basin and bath pipes is a point of obvious importance so far as the appearance of the lay-out is concerned. Further, unless the junction between the waste-pipes is well below the bottom of the bath, as shown in Fig. 1, the waste from the hand-basin may flow into the bath.



Bath. Fig. 1. Positioning of junctions between basin and bath pipes. The main waste-pipe junction must be well below level of bath.

The essential connexions for the waste and overflow pipes are shown in Fig. 2. As will be seen, the final outlet section is of lead and should be of not less than 1¼ in. inside diameter. To take this through the wall chip out the brickwork with a cold chisel (q.v.); it is preferable to remove a brick that goes right through the wall from inside to outside. Pieces of brick and some strong cement should be employed to fill the gap.

If it is permissible to use a rainwater head, as shown in Fig. 2 (the L.C.C. and certain other authorities do not permit them to be used for waste discharge), fix the head to a two-inch cast-iron pipe, and run the pipe straight down to a gully-trap. Should there be a suitable rainwater head in a down pipe from the gutter close at hand, the lead pipe from the bath and basin can be taken direct to it.



Bath. Fig. 2 Essential connexions for waste and overflow pipes, using outside rainwater head

Most of the jointing can be carried out very easily by means of compression joints. When the pipes are cut to the required lengths with a hacksaw only a spanner of the required size is needed to fit these unions. However, it should be noted that special extension types of these simple devices are required when making connexions between the copper pipes and those of lead or iron.

When the bath is finally in position a test with a small quantity of water is advisable in order to determine that its natural flow is to the waste and that no residue is left. The bath itself will provide an incline, but in rare cases it may be found that there is an unevenness in the floor which offsets it. A correction can be made by inserting wedge-shaped pieces of wood under the supports at the head end.

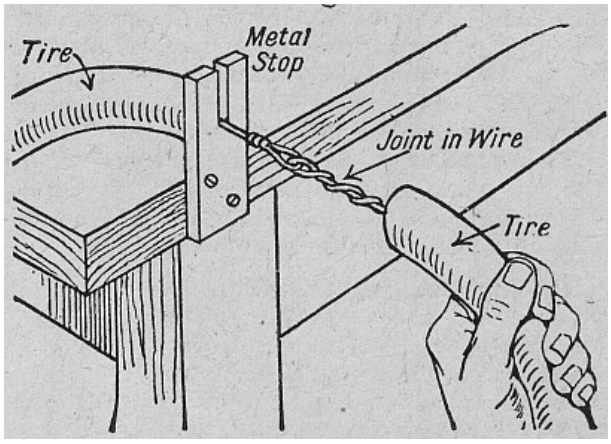
It will be appreciated that these directions apply only to the installation of a single bath and hand-basin in a building. If added to an existing system special provision must be made for ventilating the trap and

waste-pipe.

BATH BUN. Take 1 lb. flour, 2 oz. margarine or butter, ¼ oz. compressed yeast, ½ pint milk and water, 1 oz. sugar, 1 egg, pinch mixed spice, 1 oz. currants, 1 oz. sultanas and a little candied peel. Mix the yeast and sugar in a warm basin until it liquefies, then add the tepid milk and water and the egg well beaten up.

Put the flour into a warm basin and, making a hollow in the centre, pour in the yeast mixture and mix in well. Cover with a cloth and set to rise in a warm place for one hour. Melt the fat and beat this and the fruit in well, again setting the mixture in a warm place for an hour before shaping into buns and placing on a greased baking-sheet. Leave them for 20 minutes, then bake in a hot oven for 10 to 15 minutes. Just before taking the buns out brush them over with a glaze made of sugar and water, and garnish with candied sugar.

BATH CHAIR. Unless the working parts of a bath chair, particularly the wheels, tires and axles, are kept in good order, a great deal of effort will be wasted in overcoming unnecessary friction. The wheel hub, axle, and spring are the points that need attention in most bath chairs. Supposing the chair to have been out of use for some time, the following points should be specially noted:



Bath Chair. Diagram illustrating correct method of making a joint in a wired-on solid tire.

The chair or body if of wicker work should be well brushed and cleaned. The cushions or squabs must be cleaned, and re-covered if need be, or loose covers of chintz or other material can be made without much trouble. A coach-built body, upholstered in leather or leather-cloth, can be cleaned up with a mixture of beeswax, turpentine and paraffin, or prepared wax can be used for the purpose. The coach body should be properly washed, allowed to dry thoroughly, and polished.

The chair should now be supported on boxes or otherwise and the wheels removed. With the back wheels this is done by unscrewing the dust-cap, removing the split-pin, nut, and washer and withdrawing the wheel. On some machines a ball-bearing hub is used similar to that on a bicycle, and can be treated as such. Most bath chair wheels are fitted with solid wired-on tires generally circular in cross section. If those on the wheels are badly worn they may be replaced by new tires. *See* diagram; also the article on Perambulator.

Clean the bearings and hubs with paraffin, and thoroughly lubricate with cycle lubricating oil. Replace the wheels. The front wheel generally rides on a spindle between the jaws of the front fork; it is removed by unscrewing the nuts and springing the forks open to allow the wheel to drop out. The steering head and arm should be looked to, cleaned and lubricated. The springs must now be cleaned and lubricated. If only one leaf is used for the springs it will only necessitate cleaning and oiling the supports, but if two or more leaves are used the best thing to do is to lift up the body; this will separate the spring leaves, when oil can be squirted between them with the aid of a small oilcan with long spout, all surplus oil being wiped off. *See* Tire.

BATH CHAP. When bought uncooked a cured or pickled pig's cheek requires soaking for several hours before putting into a saucepan with warm water to cover, and brought to the boil, afterwards being allowed to simmer slowly until tender. To dish, remove the skin and cover the meat with browned breadcrumbs. *See* Bacon.

BATHING. Open-air bathing combines the tonic effect of immersion of the body in cold water with vigorous exercise of many muscles. In those who are unaccustomed to it over-fatigue and excessive chilling of the body may easily be induced, perhaps to be followed by fainting, which is the most serious danger in this sport. When a person is seized with a cramp it is possible to turn on the back and float, but the swimmer who faints will sink.

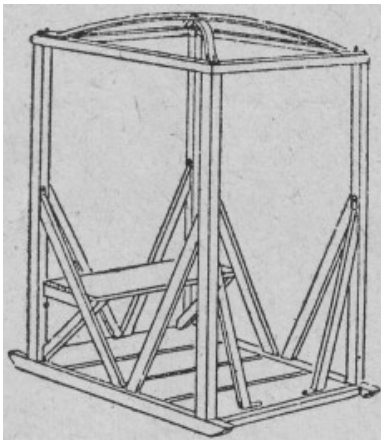
It is not advisable to bathe after a full meal nor when one is fasting. The best time is about an hour after breakfast, and if bathing is indulged in before breakfast a little food should be taken first.

The first swim of the season should be a short one. On coming out of the water there should be no dawdling in dressing, and a sheltered spot should be chosen for the purpose. A short run will help to remove the stiffness, and if necessary produce a glow. Those who remain chilled and blue in spite of this should discontinue bathing.

BATHING DRESS. The regulation bathing dress or swimming suit is worn by both men and women. Other styles, governed by fashion for women only, can be made from paper patterns to be obtained through any fashion journal, while regulation swimming suits can be purchased cheaply.

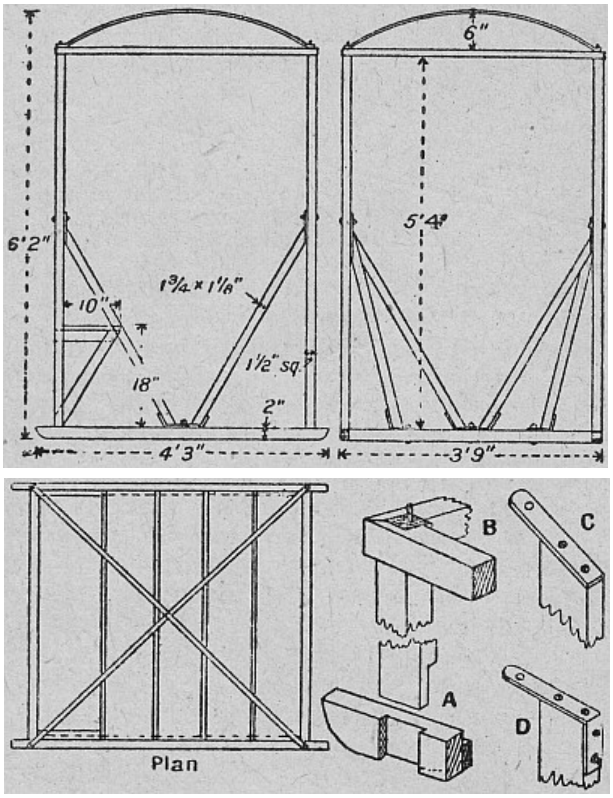
BATHING SHOES. Shoes in which to walk over the shingle to the water's edge can be made at home. Buy a pair of thin cork soles of the same size as the shoes generally worn and also a pair of straw soles one

size larger. Cut two pieces of canvas or proofed material for the top of the shoe and two pieces of jap silk in the shape of a flat iron, and measuring 4½ in. across and 5½ in. long. Place the right sides of one piece of material and one piece of jap silk together, and sew along the straight edges. Turn the right side out, place over the toe-part of the smaller sole, turn the edges over to the under side, and sew firmly, forming the toe of the shoe. Now place this sole on one of the straw soles, and with crochet cotton sew the two firmly together, using a buttonhole stitch. Ribbon sandal straps of required length can be sewn on.



Bathing Tent. How to make a tent consisting of a wooden framework to be covered with canvas.

BATHING TENT. The framing shown above for a bathing tent is designed to stand considerable wear



and yet be quite portable. Front and side elevations and plan are given in the diagrams. The main uprights are 1½ in square. The bottom framework is composed of two 4 ft. 3 in. lengths of 2-in. by l½-in. material, into which two 3 ft. 9 in. lengths of l½-in. material are tenoned.

The uprights are halved into the 2-in. pieces, and the floor boards are nailed or screwed on to fillets nailed on the inside as shown at A. The top frame is screwed to the uprights, as at B, projecting pieces of iron wire or stout wire nails being driven in to provide a means of fixing the top. The struts are all of 1¾ in. by 1⅛ in. wood, to which lengths of thin iron bar are attached with screws, the tops being shown at C and the bottoms at D.

Ordinary bolts and nuts should be used to attach the struts to the uprights and the bottom frame. The seat is placed on a bracket, halved at the corners and attached to the uprights, and the top is composed of two lengths of iron bar riveted together in the centre, and fitting on the top of the uprights through holes in the ends.

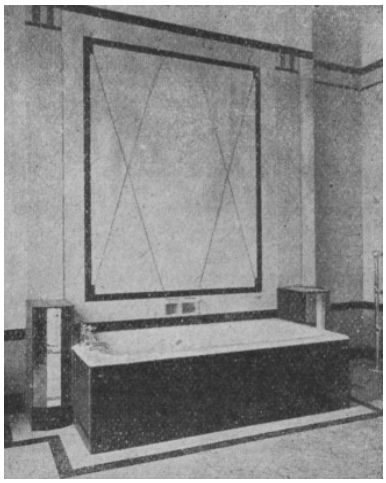
One length of canvas is attached to the sides and a separate piece cut out and shaped to go over the top. Tapes are the best means of securing the canvas to the framing, and also to close the opening. Give the whole of the woodwork and iron several coats of oil paint.

THE BATHROOM AND ITS FITTINGS

Hints and Suggestions for the Modern Home

The Technical Aspects of the Subject are dealt with under Bath; Boiler; Geyser, etc.; the Health Aspects in the article immediately following. See also Plate, page 128.

Colour is attractive in bathrooms. Even if white baths and fittings are retained, though these are to be had in almost every shade bright colour is chosen for decorative schemes. Floorings in mosaic, marbled rubber, cork-tiling and linoleums; curtain materials of oiled or rubberised silk, terry towelling and American cloths, tilings for dado and wall, panels of vitrolite, slate, or nicolite for sides of bath, etc., and of glass for ceiling, bath mats and towels—all can be carried out in harmonious colours. When it is a case of doing up a bathroom in a rented dwelling, brightly painted woodwork and steam-resisting enamel will remove a dingy appearance, and with simple accessories not involving much expense.



Bathroom made entirely of glass. The use of black and one colour gives a beautiful effect. (Photo from Jas. Clark & Son, Ltd.)

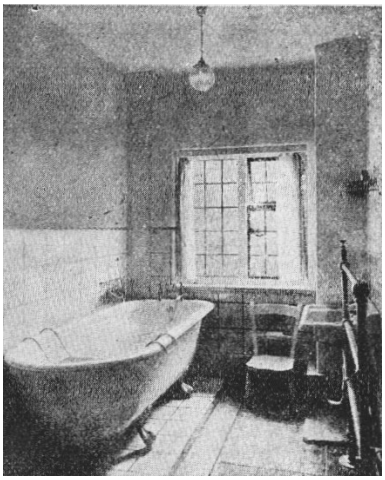
A bathroom entirely of glass, as illustrated, is highly decorative in black and a colour. Another scheme can be carried out in polished and enamelled slate for walls, and for the sides of a built-in bath, with capping and skirting in a contrasting colour.

Slate can also be obtained in panels with a marbled effect and used for dado and bath, with a rubber flooring to tone. To modernise a bathroom in an old house much can be done with attention to details such as electric fitting, new curtains and colour. A simple scheme, with white porcelain bath, white tiled dado, a colour-contrast in painted walls and ceiling and red cork-tiling for floor, is shown in the bottom photograph below.



Modern design bathroom with marble bath, paper imitating green marble and sycamore table with glass top.

Besides the bath, an important requisite is a pedestal lavatory basin of glazed porcelain, with hot and cold water taps. The one illustrated has an easy-to-clean mirror above, without frame but with bevelled edges. The curtains are of rubberised silk. Taps, like other fittings, should be nickel-plated. They require no polishing, only wiping with a clean cloth. If there is no hot-water supply laid on to the basin, it is possible to obtain a bath geyser which has taps on either side, and if the lavatory basin is placed beyond the head of the bath the same geyser may serve both.



Bathroom. Scheme with white porcelain bath, white tiled dado and coloured walls and floor. (Courtesy of Country Life)

Above the lavatory basin may be one or two glass shelves, resting on nickel-plated fittings to hold various requisites. Towel-rails should be nickel-plated for choice. It is necessary to provide pegs on the door to hang dressing-gowns, etc

The bath itself should be provided either with hanging baskets, or a rack, nickel-plated, for holding sponge and soap. A crossway seat is useful for persons who are old or weak.

Bathrooms are difficult to keep neat unless every member of the household using the room puts his or her belongings away tidily. As the basin or the bath must be flushed out after each use, it is well to provide, hanging in a convenient place, a suitable swab. Where the bathroom fittings are as described, the daily cleaning is reduced to a minimum, as nothing but a swab for the bath and another for the floor, and a dry cloth and a soft cloth for wiping the nickel fittings, is required. Where there are wooden fittings and an enamelled bath the process is more tiresome, as scrubbing and a weekly cleaning with some dry soap are necessary, and the wood must be kept polished. If unsuitable to be left constantly open, the bathroom window should be fitted with a ventilating pane.

BATHS: Hygienic and Medical. For a warm bath the temperature of the water should be between 98° F. (about body temperature) and about 103° F. A hot bath should be two or three degrees higher. Such a bath induces increased perspiration and opens the pores of the skin. It is, therefore, usually best taken at night to avoid exposure, but if this is unavoidable it should be followed immediately by a cold sponge and then a brisk rub down with a rough towel. If a hot bath is prolonged beyond ten minutes it is apt to be depressing.

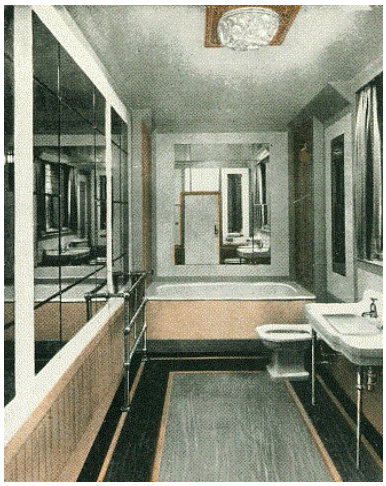
A warm bath at about 100° F. is very useful in the case of shock following large burns about the body, and especially in children it is a form of first-aid which can be quickly employed. This should be done also in the case of convulsions of children, and in the collapse following infantile cholera or any severe diarrhoea.

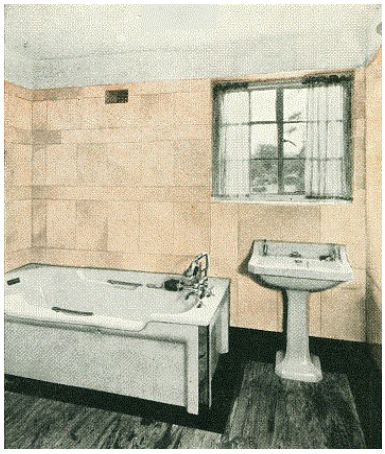
The temperature of the tepid bath is about 90° F. The cold bath varies from anything just above freezing point to ordinary tap temperature. A cold bath should never be taken when the body is chilled. People with vigorous circulations find that a cold bath taken immediately after jumping out of bed in the morning gives a feeling of exhilaration and health. After a momentary chilling a feeling of warmth comes over the body.

When Cold Baths are Inadvisable

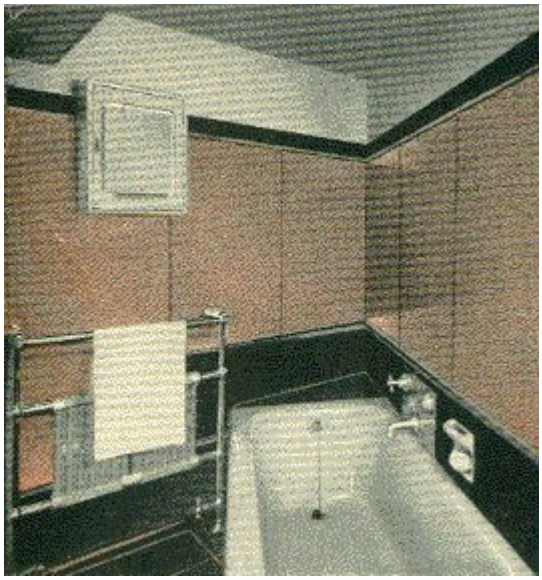
Some people do not have this reaction, but remain blue and cold after their dip, and should discontinue it. They may find that they are able to stand a cold sponging, especially if they stand in warm water, or they may have to content themselves with cold sponging of the neck and shoulders. The benefit of the cold bath is due to the shock of the cold water on the skin, and if the water is cold enough to produce this,







Above. Porcelain, glass, mirrors, rubber flooring; workmanlike lines, restful, cleanly shades of green or pale colour—these are the features of up-to-date bathrooms. Left, design for a house of superior class; notice the plate-glass shower-screen. In this and the neatly-arranged centre model the walls are lined with "Vitrolite" panels. In the simple arrangement, right, blue-green marbled and black glass is used. (*Architects: Stanley Hall, Easton & Robertson, FF.R.I.B.A., and Alan B. Stamford, A.R.I.B.A.)*





Left, the glass lining is black with silvered roughcast on the left, and primrose on the right. The difficulty of an "acute" corner is overcome with surprising effect. Above right, a fairly conventional bathroom and separate lavatory.



Left, specially shaped bath and three-fold mirror over basin. (*Ideal Boilers and Radiators Ltd.)*

say 40° below body temperature, there is no necessity to overdo it in the winter time.

Spartan temerity may be another name for foolhardiness. The cold bath should never last longer than two minutes, and as it is not sufficient to keep the body healthily clean, a warm bath with plenty of soaping should be taken in addition at least once a week.

Mustard baths, made by adding a tablespoonful of mustard to a footbath of very hot water, are sometimes used to check oncoming colds. The patient soaks the feet in the water for five minutes, while the rest of the body is enveloped in blankets.

As a rule, infants should have a bath night and morning, and older children a thorough bath once a day.

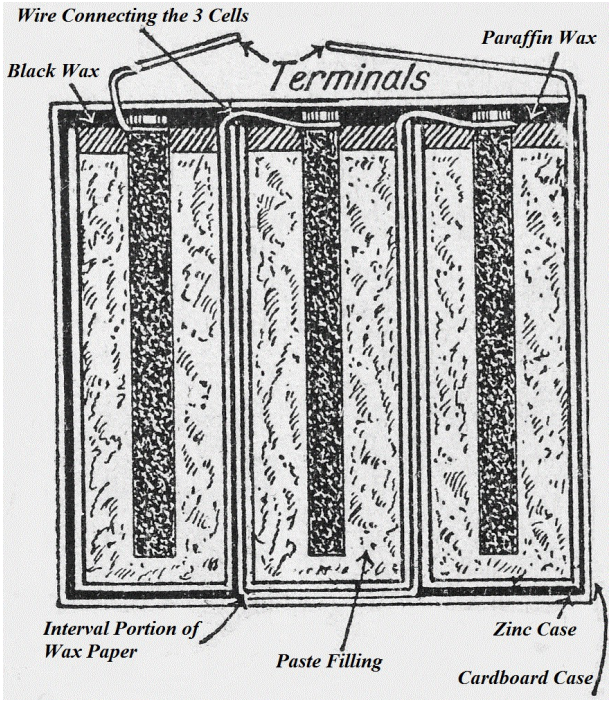
A thermometer should always be used in preparing an infant's bath, to avoid the risk of the infant being scalded by someone forgetting to add cold water.

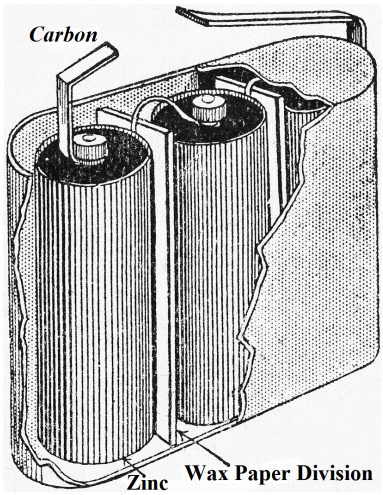
The bath water should be brought to the required temperature, about 100°, by pouring cold water into the bath and then adding boiling water until the thermometer shows that figure.

BATTEN. In the timber yard batten is the term used for unplaned wood of the following scantlings: 1 in. by ¾ in., 2 in. by ¾ in., 3 in. by ¾ in. The 1 in. by ¾ in. batten is chiefly used for tiling, but the 2 in. by ¾ in. has a multitude of uses. It is employed for tiling, joist plates, partition bases, framing for attachment of patent wall linings, for shelf supports, light cupboard framework, for making mouldings, architraves, and picture rails, and for brackets. *See also* Amateur Theatricals.

BATTER. There are various recipes for making batter. It can be made as follows: Take 4 oz. flour, ½ pint milk, 1 egg and a saltspoonful of salt. If the flour is at all lumpy, pass through a wire sieve, or let it fall through the fingers into a good-sized basin. Having mixed in the salt, make a hole in the centre of the flour, beat the egg till frothy and add to it half the milk. Pour in about four tablespoonfuls of this mixture, and with a wooden spoon stir in a little of the flour, drawing it into the centre pool from the sides. When this centre pool is about as thick as rich cream, add more milk and egg, and work in more flour, always keeping a pool of smoothly mixed batter in the centre. Go on adding the mixed egg and milk until all is used, by which time all the flour should have been drawn in.

Next beat the batter well with a spoon, until the top of the mixture is well bubbled. Stir in the remaining milk, and put the batter aside to stand, thus softening the starch grains in the flour by soaking. No more beating must be done after the last half of the milk has been stirred in. Stand the batter for half an hour, after which it is ready for use. *See* Apple Fritters; Pancake; Toad-in-the-Hole; Yorkshire Pudding.





Battery. Diagrams showing the arrangement of three dry cells in one case, as used in a pocket flash-lamp battery.

BATTERY. Electric primary batteries are pieces of apparatus for transforming chemical energy into electric energy. The forms most usually found in the home are dry batteries, such as are used in pocket flash-lamps, and Leclanché batteries for bell work. A battery consists of two or more primary cells connected according to the voltage or pressure required.

A primary cell consists of a liquid known as the electrolyte and two metals called elements or electrodes. The action depends on the decomposition of the electrolyte and the effect of the liquid on the electrodes. When a cell is at work the electrolyte attacks one of the electrodes very vigorously. This is termed the positive element or anode, the other element being known as the negative or cathode.

The flow of current in the connecting wires outside the cell will be from the negative element to the positive, hence the negative element becomes the starting point of the current to the circuit. This is called the positive pole or terminal and is painted red or distinguished by the + sign. The other element becomes the negative pole, is painted black, and distinguished

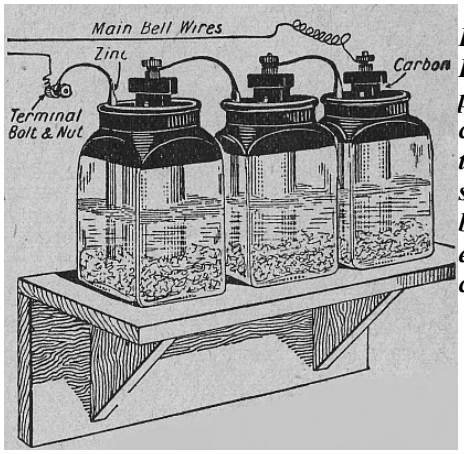
by the — sign. It is these poles that are referred to in all wiring diagrams, and not the elements of the battery.

A dry cell consists of a zinc pot, open at the top, which constitutes one element, and a carbon rod or plate surrounded by the electrolyte in paste containing sal-ammoniac, peroxide of manganese, powdered carbon, chloride of zinc, glycerine, and water.

The ordinary dry cell has a voltage of about 1½ volts. By connecting several cells in series, i.e. the carbon of one to the zinc of the next, the voltage of each is added together, hence three cells in series yield 4½ volts. The quantity of electric current available depends on the size of the cell, and is called the amperage. The quantity cannot be increased by series connexions, but only by parallel connexions, that is, by joining zinc to zinc, and carbon to carbon. It is imperative to remember this basic principle when dealing with any form of primary battery.

Of wet batteries the Leclanché is the most extensively used for electric bell work. It consists of a glass jar, usually square. The positive element is a round zinc rod, the negative element a plate of carbon.

The latter is contained in an inner pot made of porous earthenware, the carbon plate being packed in tightly with black oxide of manganese and powdered carbon. The electrolyte is a solution of sal-ammoniac in water, about 2 oz. of the former to 1 pint of water. The solution should about two-thirds fill the jar when the porous pot and zinc rod are in place.



Battery. Three Leclanché porous pot cells connected together in series to form a battery for an electric bell circuit.

It is of importance to clean the zinc rods occasionally by washing them in strong soda water, also to renew the electrolyte if the battery becomes feeble. See that the electrolyte does not creep over the outer edge of the glass jar. If it does, wipe the jar clean and give it a coat of grease around the rim, where it is painted black. See also that the terminal nuts are clean and free from deposit. *See* Accumulator; Bells, Electric; etc.

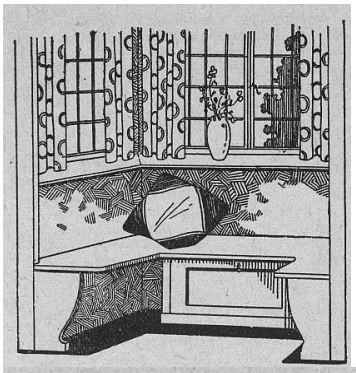
BAY. The bay or sweet bay (Laurus nobilis) is an evergreen tree with aromatic leaves. It is frequently known as Poet's Laurel. It is not perfectly hardy, and ought to have a sheltered place. Sandy loam, well drained, suits it.

A bouquet garni for flavouring soup is generally composed of parsley, bay leaf and thyme.

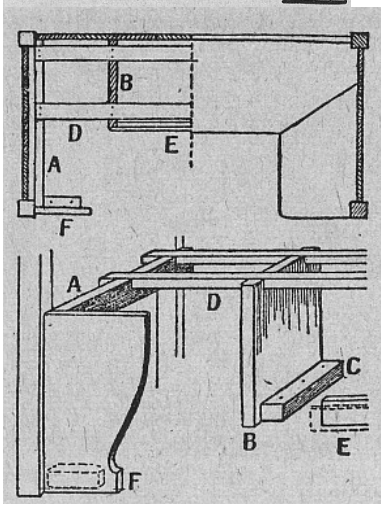
BAY RUM. Originally imported from the West Indies, bay rum owes its distinctive odour to oil of bay, obtained from the leaves of Myrcia acris, the leaves of which are distilled with white rum. It is made as follows: Jamaica rum 8 oz., spirit of wine 32 oz., distilled water 24 oz., oil of bay ½ oz. Shake together and after seven days filter through blotting paper. This toilet water is a fragrant hair tonic and is also used to relieve headaches.

BAY WINDOW: Its Fittings. The decorative possibilities of a room are often improved by this form of recessed window. The bay space may be used for a writing-table or dressing-chest and furnished with a window seat.

The window requires a cornice to hide the rod on which the curtains are hung. The rod itself should be curved so as to allow of the curtains being completely drawn. If the curtains are of silk or any thin material a second rod with a frilled valance may replace the cornice. If the curtains are of velvet or any heavy material the cornice should be fitted with a flat shaped pelmet. This may be cut in curves or in angular design and may be embroidered or edged with trimming to make a good upper part to the window scheme. Still another method is to provide the windows with casement curtains and to put the rod for the heavier full-length curtains straight across the inside line of the recess formed by the window, so that when they are drawn the recess is shut off.



Bay window fitted with a wooden seat having a locker in the centre. Working diagrams are given below and explained in the text.



Window Seat with Locker. We give here a suggestion for fitting up the interior of a bay window about 4 ft. in width. The details shown will apply equally to any

recess up to 6 ft. wide. A seat with return ends is shown, together with a locker in centre, the front of which is made to fall. American whitewood or pine, if available, will answer all requirements. A part plan of the seat is given, showing the intersection of the return end, and also part plan of under-framing.



Bay Window. Interesting treatment involving the use of casement curtains and the same material for pelmet, outer curtains and the seat cushion.

A start may be made by cutting the battens or rails A which will fix the height of the seat. It must be decided at this point whether the seat will be cushioned or not, making allowance for the thickness of cushion (if any). Roughly speaking (within limits), the shallower the seat the higher it may be. In the present instance the seat is 12 in. deep only, and may, therefore, be made 1 ft. 6 in. high and even 1 ft. 8 in. without discomfort. The rail A might be of 3 in. by 1 in. material to be nailed to the uprights of the bay. In positions where these uprights do not show, the rails may be screwed to an existing wainscot, or suitable lengths of 2 in. by 2 in. material may be erected to afford a bearing at the limits of the seat. A n additional bearing is obtained upon the locker sides B, which can be 1 in. less than the finished depth of seat.

In erecting these sides, lengths of 2 in. by 2 in. wood are first nailed to the floor at C, and the sides nailed t o these. At the top, two lengths of 2 in. by 1 in. are shown, cut in flush to the top edges of both sides B and rails A and nailed, which should afford a firm structure for further procedure. The pieces C are cut back sufficiently to take the piece E, which butts between the locker sides, to which it is nailed, in addition to being fixed to blocks behind, which are nailed to the floor. When this piece is in position it will form a rail for hanging the locker fall to, both being 1 in. thick. The fall should thus close easily flush between the locker sides and bed on to the rail D, which serves as a stop to prevent it pushing in. This fall is made of boards tongued together and glued up, the panel effect being formed by lengths of mould or ¼ in. bead, glued and panel-pinned on.

For the sake of finish, a length of thin material (¼ in. or ⅜ in.) is nailed in front of E, to finish ⅛ in. from outer edge of each end, and have its edges rounded off at top and ends. The front supports or cheeks, F, can also be fixed by blocks to the floor, as indicated by dotted line, cut to set back so as to be practically out of sight, and the further fixing can be by means of dowelling, or slot-screwing to uprights. Width can be 1 in. less than seat, and if the front edge is shaped back to not less than 9 in. the effect will be improved. In dealing with the seat the returns can be put together as shown, and tongued. The front edges and outer corners will be best rounded off, and in fitting it should be notched to intersect with posts and any other projections, so that it fits close up to the recess walls when being nailed down. Where there is available space, a sloping back about 1 ft. 6 in. high or so is comfortable and also looks well. *See* Curtain; Pelmet.

BAZAAR. Summer is the best time for the home bazaar or sale of work if refreshments and the actual sale can be arranged in the garden, keeping the side shows indoors.

The goods offered for sale should depend somewhat on the people likely to attend. Home-made confectionery will probably be greatly in demand for the sweet stall, and some of the chocolate firms supply goods at reduced terms for charitable enterprises. Home-made jams, pickles, cakes and bottled fruits will always sell at a reasonable price.

Needlework is a less certain quantity. It should take the form of either beautiful household linen and decorative articles set out in attractive colour schemes, or of novelties likely to be in demand for gifts.

The arrangements for tea should be put in the hands of an experienced person under the organizer. The supplies must be ample, and appetisingly set out. Tea can be one of the most profitable branches of the bazaar, if most of the cakes are given by friends.

The side show is an unfailing source of profit. If possible a series of short concerts, dialogues and entertainments should be arranged at intervals throughout the afternoon and evening. It is better to keep the price of the tickets low, say sixpence and threepence. In these concerts a judicious mixture of local and imported talent is good. A palmist or clairvoyante always helps to bring in money. Other attractions are fish ponds, miniature golf, and competitions such as weight-guessing.

BEACH WRAP. Useful wraps to wear over a bathing suit are easily made at home from gaily

coloured and patterned terry towelling. Fashions vary, yearly, and designs can be obtained from a good pattern service.

BEADS AND THEIR DECORATIVE USES

How to Carry out Designs on Canvas, in Crochet and Knitting, and on the Loom

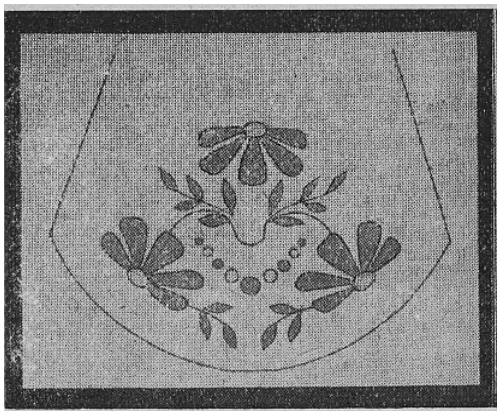
Other suggestions for the use of Beads are given under Embroidery; Lampshade; Tassel, etc.

Bead work may be divided into five classes: needle and thread bead work (on canvas or on the thread only); crochet bead work; knitted bead work; loom bead work, and novelty bead work. The fashions come and go, but by one of these methods bead-bags, bead-embroideries, necklets, bracelets, flowers, etc., can be made.

A special loom bead can be bought for the finest work in this class. There are wooden millinery beads, Venetian necklet and flower beads, rondles, a flat glass disc for threading between beads to lengthen a necklet, appliqués, tubes for dress-trimming, large glass beads and long bugles, diamanté, imitation cord, jade, etc.; beads of papier mâché, of cork, of leather and of metal. Most of the small glass or crystal beads, and also tiny metal beads are sold in hanks.

Most of the metal beads have fairly large holes and can easily be threaded with a No. 9 or 10 bead needle. These needles run in sizes from 8 to 16, and have elongated eyes which allow the passing of a thicker thread, although the actual needle is finer than the finest darning needle. For necklet threading, special cards of silk in white and colours are sold with a threading wire attaching to one end. The sizes range from 4 to 8, the lower number being the finest.

Little cards of necklet wire in gold and silver colours, medium size only, are sold for threading heavy beads.



Bead. Fig. 1. Design for a bag on canvas worked in beads.

In Fig. 1 a design for working on canvas is shown. Designs can be bought ready stamped on canvas, but an ordinary transfer can be used, with two-thread canvas, that is, two threads going both ways of the canvas and producing a square mesh. When buying the beads, get a size that will just cover the mesh, so that the canvas will not show afterwards. The beads should not be too large or the work will not set flat.

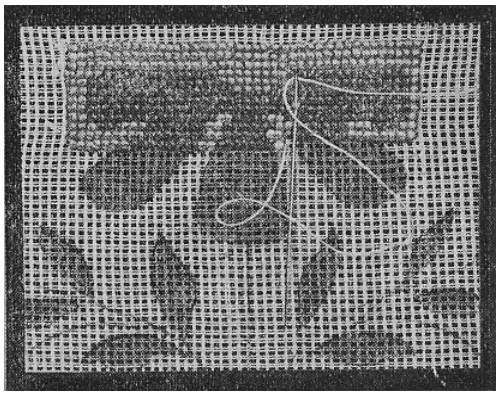


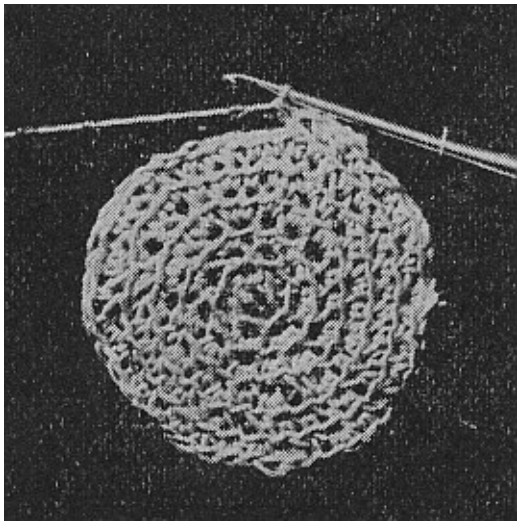
Fig.2 Portion of canvas enlarged in order to show how the pattern is followed. The work is done in rows from left to right.

This work is done in rows from left to right. Join the thread on the wrongs side, then bring up the needle at the left-hand lower corner of the mesh. Thread a bead and pass the needle down through the upper right-hand corner and up again through the mesh right underneath, making a stitch like the first half of a cross stitch with a bead resting on it. The work can be done in coloured sections, if desired. (See Fig. 2, with the needle in position.) When the end of the row is reached, pass the needle and thread through the meshes just under the beads to get back to the left-hand side. The alternative is to fasten off at the end of each row, as you must begin the following one at the left-hand side. The pattern must be followed in each row. Follow the colours and the outline for the shape of the bag, as marked on the canvas.

Bags and purses can be made by this method of bead-work. For square or oblong bags work in rounds like a stocking, beginning on a ring of chain, the size according to the width of bag required, and working on the inside with beads on the side away from the worker. Another method is to work the two sides of a bag in circles and afterwards work a straight strip, which wil] act as a gusset, and give more holding capacity to the bag.

Crochet Bead-Work for Bags

Before beginning the bead-work, procure the metal top and carry out the bead-work to fit. First unwind the thread to be used, passing it on an empty reel, and during this process slip the thumb and forefinger of the right hand along the thread to feel for knots. This is important, as a knot too big to pass through the beads means entirely re-threading, as they must be pushed down as the work proceeds. Sylko No. 8 may be used with a No. 10 bead needle and a No. 3 steel crochet hook. When all the beads on the thread have been used, cut the thread and pass the necessary beads on the new thread, then tie the latter very securely against the last bead, leaving a piece long enough to secure at the back afterwards.



Bead. Fig. 3. How to crochet beads in circles.

The method for the circular bag is as follows: Make 4 chain stitches and join into a ring with a slip-stitch to the first stitch.

1ST ROUND: * Work 1 double-crochet into the ring, but after inserting the hook into the stitch push a bead close up to the hook, so that when finishing the double crochet the bead is encircled and secured in position; repeat from * 5 times more.

2ND ROUND: 2 double-crochet into each stitch all round, always working in a bead as before, and taking up the back loop of the stitch below, throughout the work.

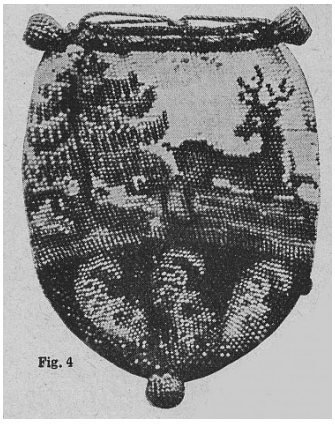


Fig. 4. A fine early example of beadwork. A small knitted bag of coloured glass beads.

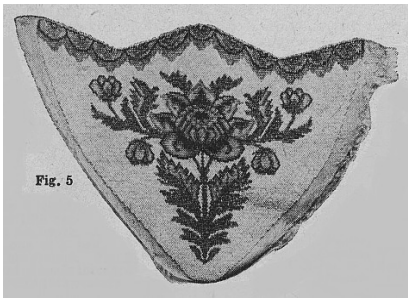


Fig. 5. Example of 18th century English beadwork. A watch pocket, one of a pair, embroidered on a net ground.

Now work alternate rounds, on the first one putting 2 double-crochet into I every alternate stitch, and 1 double-crochet into the intervening stitch, to make an increase round, and on the second round work one double-crochet into each stitch. Mark the first stitch with coloured cotton to facilitate counting stitches. By repeating these two rounds a circle of any size can be made, but do not allow it to flute; this is remedied by working fewer increase stitches on a round. Pressing with a hot iron and damp cloth will remedy curling. When the piece is big enough work two or three rows of double - crochet without beads, the size of the bag top, which fits the holes at the top for sewing.

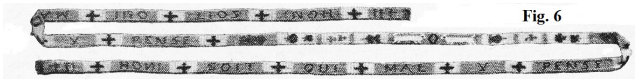


Fig. 6. A watch-guard of beads threaded together. English, early 19th century. (Photos Courtesy of Victoria & Albert Museum)

Fig. 7 shows bead work on plain knitting. Thread the beads on the silk, then decide whether a plain bag or one that will be gathered on the mount is required, so that enough stitches are allowed when casting on.

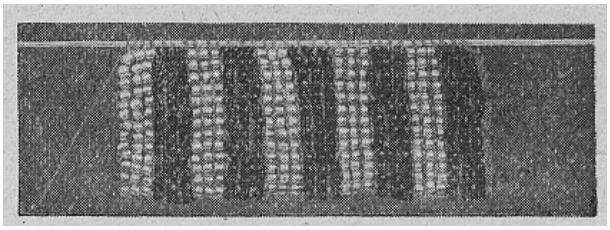
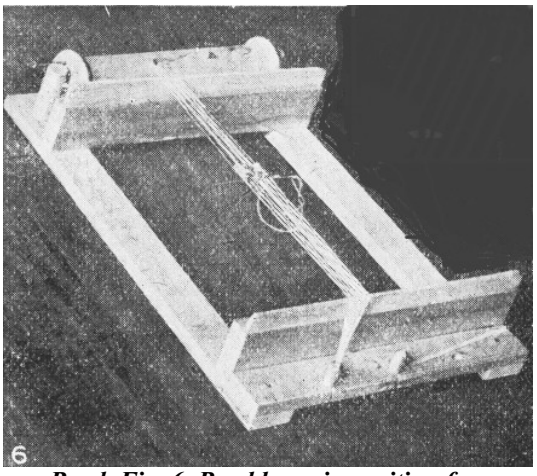


Fig. 7. Beadwork applied in stripes to plain knitting for a bag.

For a striped bag, cast on any number of stitches divisible by 6 and 3 over for edge stitches, which are knitted plain. Knit two rows plain without beads. 3rd row: Slip 1, knit 1, * put the needle in the next stitch in position for plain knitting, then push up a bead against the last stitch and finish knitting the next stitch; repeat from * to the end, and knit plain the last stitch without a bead. Now knit the next row without beads. If threaded correctly, you should now have 3 beads of the same colour to begin each row, so keeping the stripes intact. If knitting a pattern the beads should be carefully threaded in the right order before beginning to work. Any cross-stitch pattern can be copied in crochet, knitting, or loom bead work.

Loom Bead Work. The loom is a simple wooden device made in three sizes. The medium loom, 11 ½ by 7½ in., is used chiefly for necklets, purses, and bags. On this size a bag 7 in. wide can be made (Fig. 6), but it is best to work wide designs in strips, taking 20 to 40 beads according to size and join the strips together afterwards by threading in and out of the bead on the edge of the strips. Get extra long bead needles for wide designs. Any cross-stitch or tapestry design can be followed and the beads, without previous threading, are taken up each row according to pattern.

Ordinary strong linen thread or silk twist can be used. First prepare the warp threads, allowing some inches over the length of the intended article. Cut the threads in separate lengths, allowing one more thread than there are beads for ordinary flat weaving, as with a bag. The loom is placed with the spool end farthest away from the worker, Fig. 6.



Bead. Fig. 6. Bead loom in position for working, with necklet in progress.

How to Set the Warp

To set the warp, tie all the threads together on one end, and secure on one of the nails on the spool at the top of the loom. Then place the threads in rotation on the notches of the first bridge, and carry this thread down to the corresponding notch on the lower bridge. When all the warp threads are set, draw them down firmly, pass the ends through one of the holes at end of loom and push in the little peg to keep these threads quite taut; then wind the remaining length of thread round the end of the loom and pegs.

Take the weaving thread, which can be the same kind as the warp thread, thread it into the needle, and tie at the top of the first left-hand warp thread. Thread the full number of beads for the first row, pass the needle from left to right under the warp threads, and push the beads up in position between each warp. Where there are too many beads to keep on the needle let them slip down the thread, push them in position and hold under the warp threads with the forefinger of the left hand, Fig. 7. The beads should be pushed well up between the threads so that the latter do not come up over the needle when passing back.

Take the needle in the right hand, and pass it back from right to left through all the beads, taking care that the needle keeps above the warp threads to the end of the row, Fig. 8. Draw the thread up firmly. The passing of the thread under and over the work makes a selvedge on both edges When the loom is full wind the work round the spool away from you, but leave a little of the work to project over the top bridge, as the threads can now only be pressed down the notches of the lower bridge. If they were passed down the upper bridge a gap would result in the work. Secure the ends firmly round the pegs again before beginning to weave. At the left-hand side of the spool there are three holes, into one of which a loose nail is passed to keep the spool in position when working, and so keep the warp threads taut; they must not be allowed to slacken in the working.

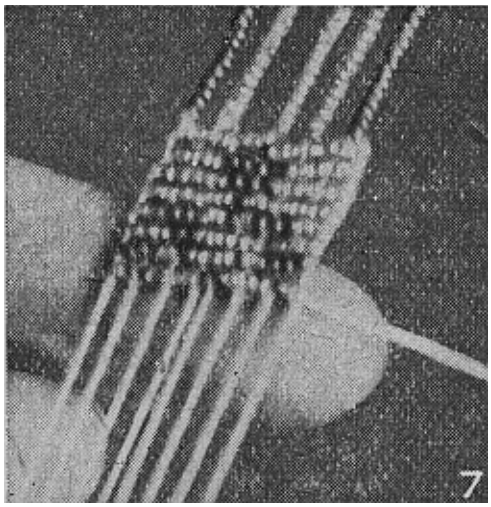


Fig. 7. First position: beads pushed up at back and held with forefinger.

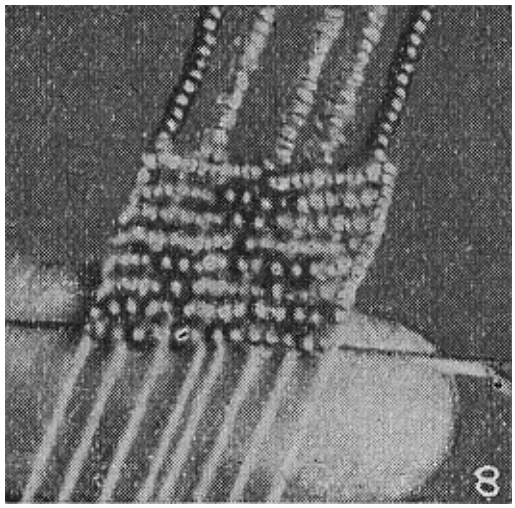


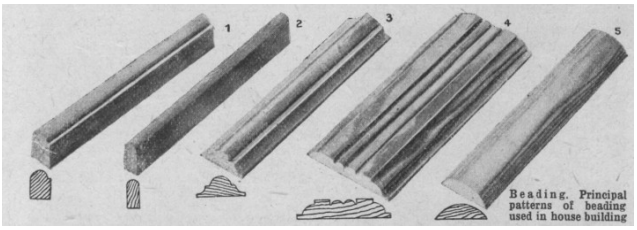
Fig. 8. Second position: needle passed back through beads above warp threads.

Embroidery is often enriched by bead outlining, as also are tapestry and paisley designs. Novelty beadwork includes necklaces, flowers, and various methods of decoration in vogue utilising beads, such as fringes and tassels for fancy work and dress.

BEADING. This is used for making fancy seams to connect two edges of material, and is an imitation of hemstitching. Beading can be bought by the yard under the name of veining. *See* Hemstitch.

BEADING. Although often used to describe any kind of moulding, the bead is, strictly speaking, a half-round moulding. These can be seen in almost any house. Thus the staff bead which holds the bottom sash of the window in position is shaped as in Fig. 1, and the parting bead which divides the two sashes as in Fig. 2. Fig. 3 shows the section of a bead used to break up the

the surface of flat panels, etc., while the centre bead, Fig. 4, is a dado or chair rail bead. Fig. 5 is the common half-round beading. Beads are often used to break the joints between various parts of work, such as on the edge of matched boarding, the panels of some kinds of doors, around door frames, to fix the glass in bookcases, shop fittings etc.



Beading. Principal patterns of beading used in house building.

BEAD PLANT. This popular plant has graceful feather-shaped leaves, and the flowers of different varieties are blue, white, or pink in colour. Usual greenhouse soil suits them, and they require to be kept moist and warm. They are propagated by means of cuttings taken in spring.

BEAKER. These are either vessels used for measuring liquids or large drinking cups. The former, made of glass, are used by chemists and marked with the various quantities. The latter are of interest as antiques, and valued by collectors. *See* Glass.

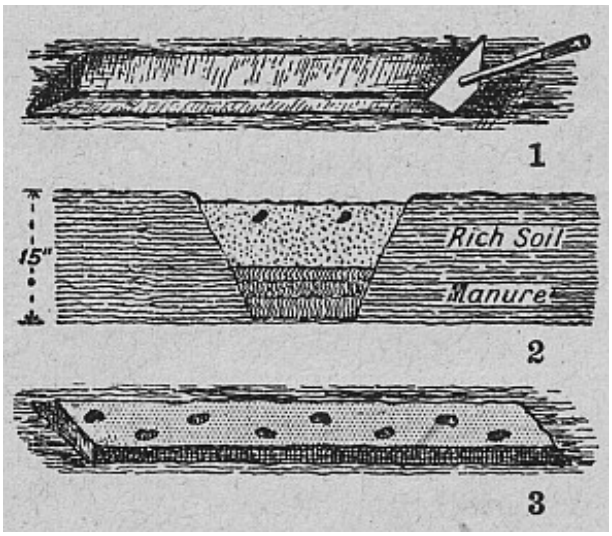
BEAM. In any building a beam is a piece of timber fixed and supported at each end, and itself supporting more or less weight. It follows, therefore, that the beam as a rule is placed edgeways, or, in other words, the depth when in position is greater than the width. Beams are called by particular names, according to the purposes which they serve. That which supports the joists of a floor is a girder or binder, over a window opening it is a lintel, when supporting the middle parts of long rafters it is a purl.

BEANS: How to Grow. Bean plants may produce very poor crops in dry seasons unless measures are adopted for resisting drought, blight, and the attacks of birds and insects. Ground that lacks lime naturally must be improved by liming, and shallow soils require a generous quantity of decayed vegetable matter or farmyard manure, placed well below the surface.

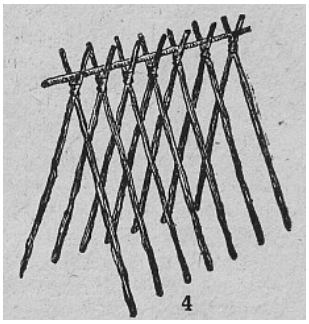
It is not necessary to use much stable manure in a garden that has been well cultivated for many years, but in dry soils some wet decayed material should be put in a trench about the width of a spade blade and about 18 in. deep. Over the manure replace several inches of earth, which should be well broken up with the rake. Upon the surface spread wood ash liberally, or a lesser quantity of sulphate of potash, and place the beans upon the compost.

Broad Beans. These may be sown 4 in. deep and about 9 in. apart, the first sowing being made in November, except in very cold districts and exposed positions. Seville longpods or the early mazagan may be sown in November.

The second sowing may be made in February, the third three weeks later, and the last in the fourth week of April. One pint of beans is sufficient to sow a row about 70 ft. long. As soon as the plants are 2 in. high powder the ground on both sides of the row with soot or wood ashes, hoe thoroughly, and draw a little soil up to the beans. Beans should be hoed once in ten days, and slightly earthed up after hoeing. If the weather is very dry, water heavily once, and mulch with any available litter, covering it well with dry earth. Before the blossom sets, nip out the top blooms to check the breeding of black aphides, and burn them at once.



Beans: methods of sowing and staking. 1. Runner beans in drill. 2. Section of deep drill for runners. 3. Broad beans in shallow drill.



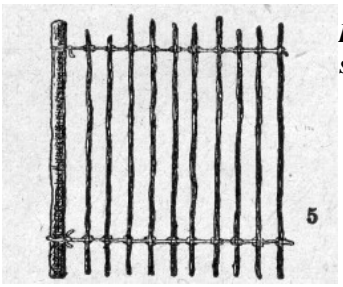
Beans. Fig. 4. Staking straight row.

Scarlet Runners. These may be sown as directed for broad beans, They must not be sown in the south until late in April, and in the north in May. It is well to make a second sowing about the first week in June. In light soil, sow in a trench and leave the earth slightly banked up on both sides. Hoe frequently along the rows and among the plants, and dress occasionally with soot or wood ash.

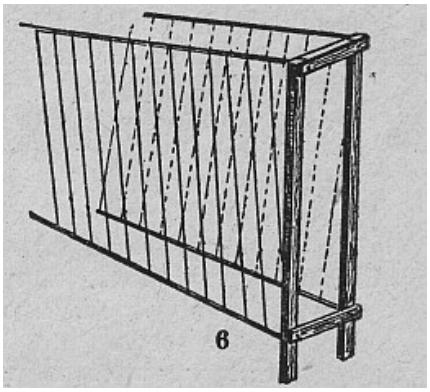
In prolonged dry weather it will be necessary to drench the bean row with water once a week, and the leaves may be sprayed with a syringe two or three times a week. Growth should be checked when the runners are about 7 ft. high, by nipping off the top shoot. A mulch of manure or litter should be applied in a drought after a heavy soaking of water. When flowers appear weak, liquid manure may be given once in 10

days. Always stir the soil with the hoe after watering, unless the rows are mulched when the beans are young.

Dwarf or French beans should be sown late in April, and about once a fortnight till the end of June. Sow in trenches and treat as for runner beans.



Beans. Fig. 5. Fence of sticks and string.



Beans. Fig. 6. Strings stretched between horizontal wires.

Beans as Food. A combination of beans, potatoes and butter with a green vegetable will supply all the elements necessary for a complete meal containing everything which health demands.

Haricot and brown or dried beans make a nourishing soup. French beans, runner beans, and broad beans are excellent as vegetables and in salads, while all the varieties of dried bean make savoury supper dishes in combination with tomato sauce, onion, cheese and other flavourings. Beans tinned with pork and tomato sauce are useful for an emergency supper dish.

Dried beans, though not so palatable as fresh ones, make a nourishing dish when properly cooked. Soak the beans for 12 hours in cold water. After this rinse well in several waters and leave for two days in a basin set in a damp, cool place, where the air can circulate freely. Then put this basin in a larger one with a little water in it, and cover the whole with a damp cloth. Within 12 hours it will be noticed that the beans are beginning to sprout, and they are then ready for cooking. Usually dried beans require boiling for about 45 min., though young haricot beans will cook in less than 30. Beans, like all other pulse foods, have in them a valuable form of anti-scurvy vitamins, and these are apparently non-existent until the beans germinate.

BEAN CAPER. Bean capers are the flower-buds of a small tree of the genus Zygophyllum, sometimes used as substitutes for the true caper. Gather the buds on a dry day, lay them on a paper out in the sun for a few hours, and turn into wide-mouthed bottles or jars. Boil one pint good vinegar with ½ oz. salt and 6 peppercorns, for five minutes. When the liquid is cold, strain this vinegar on to the capers and cork down tightly. They can be used in about a week's time, but will be better if they are kept for three months or a little more. *See* Caper.

BEAN CUTTER. A handy machine which performs the cutting of French beans and scarlet runners with rapidity, thus saving time and labour. Most of these machines also slice other vegetables, oranges for marmalade, etc.. a special grooved attachment being supplied for the cutting of beans. The machine should be kept clean and dry, and receive an occasional drop of lubricating oil.

BEAN WEEVIL. The name is applied to several species of small beetles which attack beans and peas, but it belongs properly to Sitones lineatus. The wing cases of this tiny grey-brown weevil are streaked with white lines and the head drawn out into a broad snout. The female deposits her eggs in the newly formed pod, and the young larvae feed in the seeds.

Similar destruction is wrought by two species of Bruchus (B. rufimanus and B. pisi), the first frequently found in the grub stage when green peas are being shelled. The young plants may be protected by sprinkling them with soot or fine road dust. Bean seeds should be examined before sowing, and any that have been attacked by the pest should be picked out and destroyed.

BEAR BERRY. This is the popular name applied to trailing heath-like plants belonging to the genus Arctostaphylos. They are useful for the moist side of the rock garden, and the best sort, A. Uvaursi, has pink flowers in early summer and red berries in the autumn The bear berry needs only the culture given to ordinary rock plants. *See* Rock Garden.

Beard Tongue. *See* Pentstemon.

BEARING. A bearing is any support for a rotatable shaft or similar driving part of a machine. In its simplest form it is a plain hole in the part that forms the support for a cylindrical shaft. In the journal bearing the load acts at right angles to the axis of the shaft, and includes such examples as the bearings of a mangle and the axle of a railway carriage. In the thrust bearing the load or pressure acts parallel to the axis.

The two great enemies of a bearing are the ingress of grit and dirt and the absence of a suitable lubricant. Small or delicate instruments such as typewriters and sewing-machines should have their bearings cleaned with a small brush dipped in paraffin, and then be well oiled with light-grade oil. Heavier machines such as washing machines, mangles, chaff cutters, lathes and small machinery generally need a heavier-bodied oil, known as light machine oil.

The oil must be present between the two working surfaces, and any excess outside the bearing should be

wiped off, as an oily exterior only attracts and retains dust. Adjustments are made in many different ways; the point to bear in mind is that the bearing should allow of free and easy movement of the shaft, but should prevent any shake or slackness. *See* Ball Bearings; Big End; Front Axle; Live Axle, etc.

BEATRICE STOVE. The name is applied to a particular variety of oil-heating stove burning paraffin oil. The heating elements are the wick and the tall, oval-shaped chimney or body, the vessel to be heated being placed upon the platform at the top of the stove. The oil is contained in a cast-iron vessel forming the base of the stove. These stoves are made with one or more burners. Success with these stoves demands scrupulous cleanliness, attention to the wick and the use of a good oil. *See* Lamp.

BEAUMONTAGE: Hard Stopping. This is used in the home for filling small holes, repairing damaged veneer, and similar purposes on all kinds of furniture.

It is made by dissolving a lump of resin, about the size of a large walnut, in a gill of common orange shellac, and adding a piece of beeswax about half the size of a walnut. This must be melted in an iron pot or tin can, either in the oven or on the top of a stove; only gentle heat is needed, and the mixture must not be allowed to boil. Before heating, a suitable colouring pigment must be added (about a teaspoonful) in powder form. By suitable blending almost any colour can be made to match the work to be repaired. The mixture is made into sticks by pouring some of it on to a wooden board, laying it in a line, and rolling with another board. The boards should be warmed, as the stopping hardens rapidly.

To use the material, it is melted into the hole or over the damaged places by means of a rod of hot iron. Do not have the iron too hot, or the wood will be scorched and blistered. Press the mixture well down into the hole, and leave a little of it above and around the damaged part. When dry and hard the surplus is removed with a chisel, knife, and fine or old sandpaper.

BEAUMONTIQUE. In certain classes of cabinet and joinery work an adhesive known as beaumontique is employed. It is composed of equal parts of litharge, white lead and whiting, worked into a stiff paste with boiled oil.

BEAUTY AND BEAUTY CULTURE

General Rules and Modern Methods for the Improvement of Personal Health and Appearance

Information on Special Aspects will be found under Ankle; Complexion; Diet; Figure; Hand, etc.

Want of daylight, fresh air, and exercise, improper diet and laziness are beauty's enemies. Five minutes devoted daily to the following simple exercises will improve the circulation and the digestive organs and strengthen the body.

(1) Stand with feet slightly apart, head thrown back, and bring both hands so that the backs come under the chin, fingers pointing forward, elbows close to ribs. Send hands up and out in front, as in the breast-stroke in swimming, then separate them gradually, sweeping them back and down as far as they will go. Then draw elbows up to the sides again. With these arm movements goes a trunk and leg part. Crouch low and bring the hands under the chin as described. While rising to an upright position, finishing on the tips of the toes, send the hands out in front, as described. Then beginning to crouch again, send the hands back and down, bringing them once more under the chin when quite crouched. Repeat six times. This exercise keeps the body supple and expands the chest.

(2) For reducing the waist, lie on the floor, arms stretched straight above the head. Bend the knees up towards the chest and roll over to the left side so that they rest on the floor. Roll them over to the right side and repeat this movement from side to side, feeling the turn coming from the waist.

(3) For reducing the stomach, lie flat on the floor with the hands clasped behind the head and feet under some heavy obstacle. Then sit up without raising the feet.

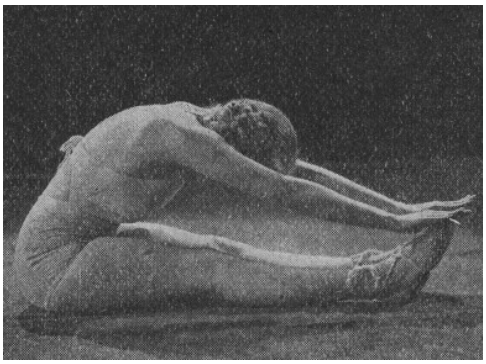
(4) A good hip reducing exercise is to lie face down on the floor, elbows out and chin resting on back of hands. Raise the right leg upward as far as you can, knee straight and toe pointed. At the same time raise the head up and back from the floor. Work the two movements rhythmically, Up-down, Up-down, giving a thrust upward with your head and leg on every up beat. Repeat eight times with the right leg, and then with the left. Then do alternate right and left for sixteen counts. Be sure to keep elbows on the floor all the time.

(5) The following is a good exercise for reducing the buttocks, and should be done regularly: Sit on the floor with legs stretched out in front of you, palms of hands flat on the floor each side of you. Raise feet from the floor and propel yourself round the room with your hands, taking care to keep the feet from touching the floor. This produces a rolling effect which wears away the superfluous flesh.

(6) To combine stretching with strengthening the whole spine, lie on back, with arms at sides. Slowly raise arms, while inhaling deeply, and extend beyond head till fingers touch floor. Stretch the whole body and begin to exhale slowly as arms return to sides. Begin another inhalation as body rises to sitting posture, taking care to let head follow shoulders and not come up first with a jerk. Then in slow continuous movement touch the toes with both hands. Do not bend knees. Exhale while returning to first position, relax whole body and repeat exercise.

The benefit to be derived from outdoor sports besides muscular development is the natural promotion of perspiration, thus eliminating poison from the system. In order to obtain full advantage from such activity of the pores, on returning home rub the body

briskly with a flesh glove and take a tepid bath.



Beauty Culture. Fig. 1. Correct position half-way through exercise 6 as described in the text.



Beauty. Fig.2.Hair brushing is more effective in the morning than at night.



Beauty. Fig. 3. Brush mascara on the eyelashes with upward strokes.

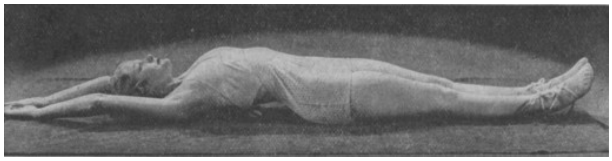


Fig. 4. An excellent figure-reducing exercise described in the text (No. 3 page 137).

Care of teeth cannot be too much insisted on. In themselves they are an important point of beauty or the reverse, and proper mastication is essential to good digestion. Regular visits to the dentist and brushing the teeth night and morning should not be neglected.

Diet is the next factor to be considered. Too great restriction in the case of normally healthy people is not to be encouraged. Plenty of green vegetables fresh salads and sound ripe fruit supply the important natural salts, which keep the blood healthy, and therefore help to secure a good complexion.

An excess of foods containing starch, sugar or fats should be avoided when there is a tendency to put on flesh. For older people the mistake of drastic measures for reduction is that after youth the skin loses elasticity and when the flesh under it is reduced the stretched skin bags and wrinkles. Scragginess, which comes from malnutrition caused by indigestion, together with the flaccid sagging of the muscles caused by lack of healthful exercise, is equally to be guarded against.

Injurious Effects of Stimulants

Alcohol has a coarsening effect on the texture of the skin. Also coffee, tea, or cocoa must not be indulged in to excess; the lirst two stimulants often causing indigestion, with flushing or sallowness as a result, and the latter overheating and liver clogging. Roughness, blotchiness and redness of the skin are usually caused by acidity. In addition to the elimination of poisonous acid by perspiration and avoiding sugary and starchy foods and acid fruits such as currants, strawberries, plums, etc., the habit of frequently sipping a glass of water before meals and at night should be cultivated—an internal bath, cleansing the system of many impurities. Constipation should never be allowed, but drugs should only be taken on a doctor's advice, as promis-cuous dosing may be harmful.

Eating between meals is a mistake. The digestive organs require a rest. Constant chewing of sweets spoils the shape of the mouth, and over-smoking is detrimental to clear eyes. There are other bad habits to be avoided or corrected. In walking, too short or too long a stop is tiring and throws out the balance of the body. A stride should suit the length of leg; there should be a free swing from the hips without wobbling, and steadiness of the shoulders. When standing an incorrect attitude is to thrust one hip outwards and distribute the weight of the body unevenly. A bad habit in sitting is to flop down so that the end of the spine, instead of supporting the body correctly, is curved under. As this, if continued for any length of time at a sedentary occupation, causes a strain on the internal organs, backache, a stoop and restricted breathing, it is most important to practise sitting upright, the base of the spine touching the back of a chair and the head in line with the body. When resting it is better to lie down flat than to loll in an easy chair. Screwing up the eyes is sometimes imitative, and should be checked; where caused by eyestrain, glasses should be worn.

Hair should be combed out at night, but vigorous brushing has a more beneficial effect when the body is not tired (Fig. 2). If the hair begins to come out a good tonic should be used. Dandruff must be prevented; it is impossible to have beautiful hair without a clean scalp. Most hair, if properly brushed, has sufficient gloss without using brilliantine.

Cosmetics have a place in beauty culture, their use being to preserve, whiten, smooth and brace the skin. To keep the contour of the face and the elasticity of the skin a simple form of massage may be gone through daily, after the physical exercises in the morning, as the muscles relax during sleep and want keying up. Having spread a little skin food or cold cream over the face, place the fingers of both hands on the cheekbones, the thumbs meeting under the chin, and with firm pressure pass them upwards to the fingers on each side, repeating the movement for about two minutes. Next place the tips of the fingers on the points of the jaw and work them firmly upwards past the corners of the mouth to the base of the nose.

Repeat this movement for about a minute. Then tap in a small quantity of cream round the eyes, using the third finger of each hand very lightly and working

from the inner corner of the eye outwards for a minute, and for another minute, having closed the eyes, very gently pass a finger along each eyelid, continuing the movement outwards to the edge of the hair. The whole process takes five minutes. After the massage the face should be bathed with a good astringent lotion.

Allowing five minutes for the extra hair brushing, five minutes for the physical exercises, and five minutes for the facial massage, it will be seen that beauty culture demands only one quarter of an hour each morning. Soaking daily in a hot bath enervates instead of braces the muscles. A quick warm bath, using a long-handled bath brush and followed by a cold sponge, keeps the skin in good condition. On alternate nights cold cream and an astringent complexion milk, such as a cucumber and benzoin preparation, should be applied. The first should be lightly rubbed and tapped in with the third finger, thus avoiding the danger of stretching the skin, and any superfluous cream wiped off; the second should be dabbed on with cotton-wool and allowed to dry in, thus alternately feeding and toning up the skin. The neck should be treated with the same preparations. Before applying these at night, the skin should be cleansed with a pure soap and hot water.

Make-up is somewhat a question of fashion, but should also be one for the individual, emphasising good points and glossing over bad, not a meaningless routine of cosmetics. Artificial colour may be unnecessary, because by following hygienic rules, sallowness and the whiteness of anaemia will be corrected. The clear, healthy pallor that is natural to some complexions is a beauty and should not be rouged.

When colour is used the shade must be chosen to suit the skin, the smallest quantity being applied lightly to the upper cheek-bones with absorbent wool if a powder, or with the tip of the finger if cream or liquid, and the face powdered afterwards. With regard to the lips, lipstick should tone with rouge or harmonise with natural colour.

For Eyelashes and the Skin

Castor oil used every-night, applied by a camel-hair brush, has a darkening and strengthening effect on lashes and eyebrows.

Mascara should be brushed on lightly with an upward movement, and eyeshadow should tone with the colour of the eyes as nearly as possible. This should be applied to the edges of the lids nearest the lashes and smoothed upwards and outwards (Fig. 3).

Sensitive skins may develop a rash from washing in hard water, and then it is better to use a good cleansing cream or milk, with a mild astringent to remove the grease.

It is most important to select the right creams, soap and powder for the individual skin; once these have been discovered they should be adhered to. Cheap powders clog the pores and produce blackheads—a silk-sifted pure rice powder delicately tinted to tone with the natural skin is the safest and most becoming.

Sound sleep in a well-ventilated room is most important. It is one of the best beauty specialists in the world. When late hours have to be kept at night, if possible make up arrears in the daytime.

BEAVER. A fine greyish-brown fur used for winter coats and expensive for trimmings. Though light in weight beaver has great durability and a beautiful quality which easily distinguishes it from its imitations.

A silk beaver for hats has been largely ousted by velour. *See* Fur; Velour.

BEAVER BOARD. A Canadian product named beaver board is used for the covering of internal partitions and similar purposes. It is composed of wood fibre worked by a patented process, and resulting in a five-ply board approximately ¼ in. thick. It is clean and pleasant to handle, is made in a range of convenient sizes, and obtainable from any good builders' merchants. *See* Partition.

Bed Bug. This is a variety of the insect known as the bug (q.v.).

BED CRADLE. A cage made of metal hoops and long wooden or metal struts is used under the name of a bed cradle in cases of illness to raise the bedclothes off the patient. This is necessary in fractures of the lower limbs, as the weight of the bedclothes may displace the foot. The apparatus can be used to give a hot air or vapour bath or to suspend an icebag for the relief of pain in appendicitis. In case of an emergency, a three-legged stool, a strong cardboard box with ends cut arch-shaped, or a child's hoop cut in two pieces, crossed and screwed together, make excellent cradles.

BEDDING. Too much importance cannot be attached to proper bedding, when it is remembered how vital sound sleep is to health and the amount of time spent in bed. The best kind of foundation is a good spring mattress. This may be either of the box spring variety or the ordinary spring with a stuffed overlay, or the wire spring mattress.

When an overlay mattress is used on box or spring it should be sent to be cleaned and remade periodically. Unless this is done every few years it is impossible for a stuffed mattress to be hygienic or comfortable, as the stuffing becomes matted and consequently lumpy. A good mattress will last for many years with occasional re-covering if cleaned and restuffed.

The wire spring type of mattress consists of a series of springs sewn into pockets and placed inside a cover. Over the springs a padding of hair or felt is laid, obviating the necessity of an overlay and keeping the full resilience of the springs The mattress is then upholstered. There is no expense of upkeep with such a mattress, as it is fitted with vents for airing; the bedding is automatically kept fresh and does not absorb or retain any perspiration from the body. Loose

washing covers for top mattresses and box springs are desirable and save the mattresses.

The pores of the skin are most active during sleep, and for this reason the thorough airing of bedding and bedclothes is essential, and the temptation to make the beds immediately their occupants rise in the morning should be resisted. The mattress itself should be turned every other day from end to end, and on alternate days from side to side, so that each part in turn bears the extra weight. It ought to be taken into the garden and exposed to sun and air at regular intervals. All blankets must be regularly shaken and, if possible, put out at intervals in the sun. *See* Bedstead; Blanket; Bolster; Box Mattress; Eiderdown; Mattress; Pillow.

BEDDING: In the Garden. The flower gardener always arranges for his principal floral features to be displayed in the position where he can best enjoy them. The suburban or villa amateur cannot generally have his best floral effects beside the approach to his front door or under his front windows, but the country gardener can make such a provision.

In laying out beds the curved plan is preferred by many, especially where there is a lawn with a curved line. Rectangular beds economise working, and are more easily kept trim. The size of the beds ought to bear some relation to the width of the walk and the area of the lawn, where there is one. Small beds are troublesome if there are many of them, but very large beds have practical drawbacks too. Extra care has to be taken in the planting, for every cultural process among the inner plants means getting on to the bed.

Neither bedding plants nor herbaceous perennials can give an unbroken display of bloom throughout the year, but it is possible to have colour by the utilisation of shrubs, especially those which are fairly small and compact, such as mezereon and other daphnes, azaleas, heaths, and kalmias.

Some evergreens are slow in growth and thrive in ordinary soil, notably some barberries, laurustinus, veronicas, box, selected cypresses and tree ivies. These would be long before they outgrew the accommodation of small beds. There are small, neat evergreens in abundance which keep the beds green till spring brings in the flowers. Some of the best spring subjects are primroses, polyanthuses, auriculas, wallflowers, forget-me-nots, aubrietias, arabises, daisies, yellow perennial alyssum, and Brompton stocks.

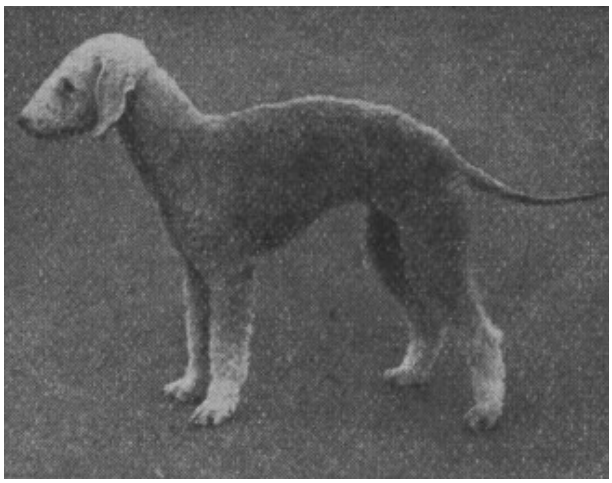
Beautiful beds can be provided at no great cost. It is possible to buy most of the plants named in autumn, but it is far cheaper and more satisfactory to raise them at home. By purchasing seed quite early one may get the very finest strains for a small outlay. *See* Flower Garden; Primrose; Tulip; Wallflower, etc.

Bedding Out. While bedding simply means a rearrangement, bedding out implies the transference of plants of a half-hardy nature from the shelter of the greenhouse to the open bed in late spring or early summer.

BEDFORD CORD. The feature common to all fabrics known by this name is a raised tubular cord or rib running lengthwise. Woollen Bedford cords are one of the best materials for riding breeches. The material is intended for breeches, and made in trousering width (27 in.). It looks a little clumsy in coats, but officers' complete uniforms have been made from it. Cloths similar in weight and appearance are made also in cotton and are cheaper; they are not so warm, are more easily soiled, and less suitable for wet weather.

A lighter make of cotton Bedford is used for summer dresses and is sometimes called piqué, although in true piqués the tubular ribs run crosswise. not lengthwiseof the pice. The better qualities make excellent coats and skirts, white or in light colours. They wash and wear well, and are especially suitable for sports wear. *See* Piqué.

BEDLINGTON TERRIER. An intelligent guardian of the house, entirely dependable with children, this dog stands in the front rank as a destroyer of rats and other vermin. But although affectionate where his owner's family is concerned, he is suspicious of strangers and jealous of his own kind. The Bedlington has a hard though rather woolly coat of dark blue, tan liver, or sandy. The head is narrow, with a long, tapering, sharp muzzle. The long, sharply pointed tail is only slightly curved. The back is very arched. The animal stands about 15 in. high, and weighs about 24 lb. *See* Dog.

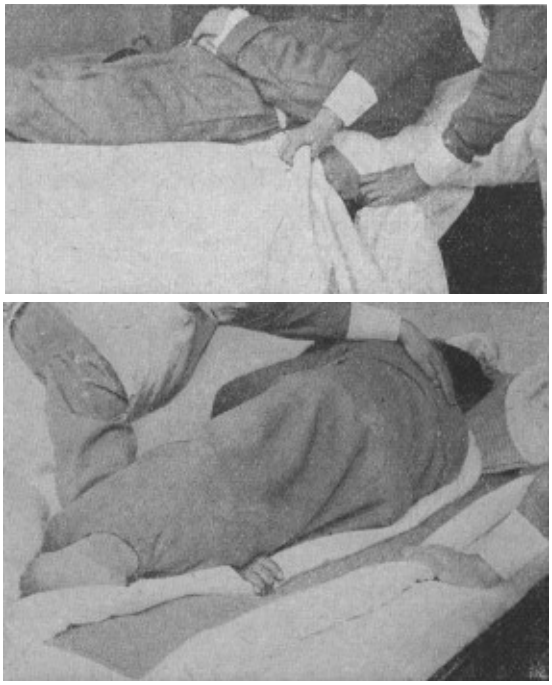


Bedlington Terrier. A good house dog and ratter.

BED-MAKING. The bed should be stripped every morning, the mattress turned and the bedclothes left to air. The under-blanket is then laid smoothly on the mattress. The bottom sheet must be thoroughly tucked in all round, so that there is no possibility of rucking up. Top sheet and blankets are then put on one by one, and tucked in at the bottom. The top sheet is turned down over the blankets, the pillows put in place and the whole covered by the bedspread. The bedspread is removed at night and the down quilt put in place.

Bed-Making for Invalids. A feather bed should

never be used in cases of illness. A good hair mattress is best, but a straw one does very well, particularly in infectious cases, because the stuffing can be burned. Where the illness is likely to be prolonged it is bent to dispense with the under-blanket and to replace it by a mackintosh sheet. If the under-blanket is used it should be large enough to tuck well in all round so that it may be kept smooth and not cause bed sores. The lower sheet is then put on in the ordinary way, and on top of it a draw sheet may be placed. This is an old sheet, folded to a sufficient width to reach from the shoulder blades of the patient down to his knees, and laid across the bed. It is tucked in at each side beginning with the greater part on one side and only a small turning on the other. It is shifted along a little every day until the bulk of the tuking in is done on the opposite side from which it started. In cases where the under blanket is retained, a mackintosh sheet may be placed under the draw sheet.



Bed-Making. Changing an invalid's sheet. Above, changing sheet from above downwards. Below, changing sheet from side to side.

The upper clothes should be warm but light, and no heavy, airproof counterpane should be used. A ventilated down quilt is the best means of obtaining extra warmth, as its weight is insignificant. In some illnesses, e.g. acute rheumatism or nephritis, the patient is nursed between blankets, and no sheets are used.

When the bed has to be made it can be done quite simply without disturbing the patient. First loosen all the bedclothes. Then let two people stand one on each side of the bed and take hold of the under blanket or mackintosh sheet, pulling against each other until all wrinkles are smoothed out. The same is done with the under sheet. Raise the patient slightly under the shoulders and shake up the pillows. Then lay him down and make all tidy.

Sheets can be changed as follows: When a clean top sheet is required, have it aired, warmed and ready. Remove the top blanket from the bed and lay it over the clean sheet. Then take sheet and blanket together and lay them on the bed, while a second person stands at the opposite side ready to assist. Loosen the soiled sheet and the remaining blankets on both sides. The second person then seizes these and draws them quickly away, while the first holds the clean sheet and blanket in position.The clean sheet is then tucked in.

Methods of Changing the Under Sheet

There are two methods of changing the under sheet, according to the nature of the patient's illness. The more usual is to change it from side to side. Two people should assist, one on each side of the bed. First the bedclothes are loosened and the clean sheet, rolled lengthwise, is brought to the bedside. The soiled sheet is then rolled up until it reaches the patient, who should be lying on his right side, and the clean sheet is rolled along behind it. Thus the two sheets will be resting against the patient's back in two long rolls down the middle of the bed. The patient is then rolled gently back on to his other side, and the second person draws the soiled sheet from under him, following it by the clean sheet. Once it is clear of the patient it can be straightened out and tucked in. A draw sheet is changed in the same way.

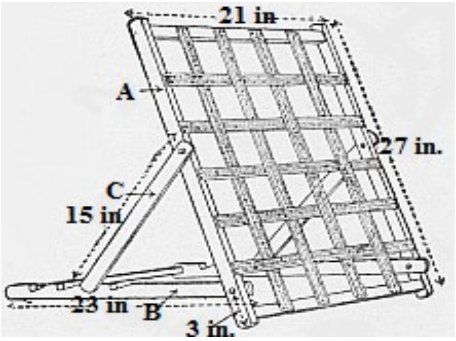
If the patient has to be lifted, as in most surgical cases, the change is effected from top to bottom of the bed instead of from side to side, and the sheet rolled widthwise instead of lengthwise. In this case the sheets will be rolled down until they are under his shoulders. The second person then raises him under the shoulders sufficiently for the sheets to be passed on as far as his hips. These are then raised, and the sheets can be drawn down beneath his legs and the change completed.

It is even more important in winter than in summer to see that a patient's bed sheets are thoroughly aired and warm. When the invalid is not too ill to leave his bed during a change of linen, the best method is to fold back the upper sheets and blankets, and to iron the lower sheet backwards and forwards several times with a hot iron. When, as in cases of severe rheumatism, etc., it is necessary to make a hot pack, the bed is prepared by putting a mackintosh covered with a hot blanket on it. A large sheet is rolled up lengthways and wrung out in boiling water, a large towel being used as a wringer. The patient is turned on one side, the sheet, half unrolled, is placed alongside, and then he is rolled in the sheet. The blanket underneath is then turned over to cover the patient in the sheet, while another mackintosh and several more blankets are placed over him. *See* Bedspread; Blanket Nursing; Sheet.

BED-PAN. The bed-pan is a utensil which should be in every home. In many cases of even slight illness patients suffer harm from chills, strain of the heart,

etc., by getting out of bed. Before use, the bed-pan should be warmed and the margin covered with flannel. After use it should be emptied and cleansed as soon as possible. It is wise always to keep some disinfectant in it, such as Lysol or a carbolic solution.

BED-REST. A comfortable bed-rest is a necessity in many cases of illness. A chair placed upside down and covered with a large pillow can be used as a temporary substitute, but where the patient has to face a long convalescence, as after a broken leg, it is usually worth while to buy a proper bed-rest. It is essential to have one in some types of chronic heart disease, where the patient cannot breathe comfortably if lying down.



Bed-rest. Easily made folding pattern. An explanation of the lettering is given in the text.

Making a Bed-Rest. The figure shows a simply made folding bed-rest. The framework, A, is 27 in. by 21 in. and made of wood 1½ in. by ¾ in. for the uprights, and 1¼ in. by ¾ in. for the rails, which are tenoned or dowelled into the sides. The back is webbed as shown. The rack, B, has the notched rails 23 in by 1½ in. by ¾ in. and a stretcher rail 1 in. by ¾ in. tenoned or dowelled. The supports, C, are 1½ in. by ¾ in. by 15 in. and are joined by a stretcher rail 1¼ in. by ¾ in. B and C are hinged to A by iron bolts 2¼ in. by ¼ in. A washer should be placed between the two pieces of work. Pine, beech or American whitewood are suitable for making this article.

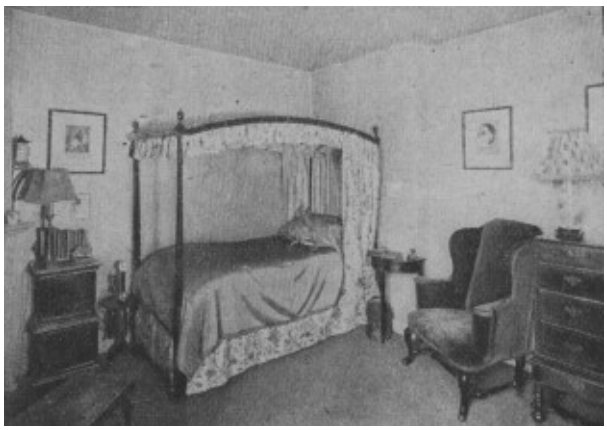
THE BEDROOM: DESIGN AND DECORATION
Ideas that Produce Harmony and Hygiene in the Sleeping Room

For the Furniture of the Bedroom see Bedding; Bedstead; Dressing Table; Wardrobe, etc.; also Bed-making; Bed-Sitting Room; Colour Scheme, etc.

Exciting designs and colours are out of place in a sleeping room, where the effect should be restful; also, it is advisable to dispense with heavy hangings and furniture not easily moved and cleaned.

In a small house, where the bedrooms open off one landing or corridor, a pleasant scheme allows of individuality in the separate rooms, but is harmonious when the doors are open. Thus the pattern of a cretonne in one room repeats the colour-note of paint and carpet in another, and so on. Building a colour scheme up to the already chosen design of wall-paper or fabric for hangings is often a good way to start new decorations.

The aspect of each room has also to be considered. An east room which will get the morning sunshine may be in cooler colours, and the same applies to a south room, but in a north room it is necessary to have walls which will suggest sunshine and reflect all the light there is. For a room facing north, or where, as in the case of many town houses, the sunlight is intercepted by other buildings, there is nothing better for the walls than the colour-range from cream to orange with clear yellows and discreet use of pinks; for a sunny south room, cool blues and greys, and in a west room mauves may be selected; but in case of bedrooms, individual taste should make itself felt and the room be characteristic of its occupant.



Bedroom. Small room in Georgian style with sprigged chintz canopy bed.

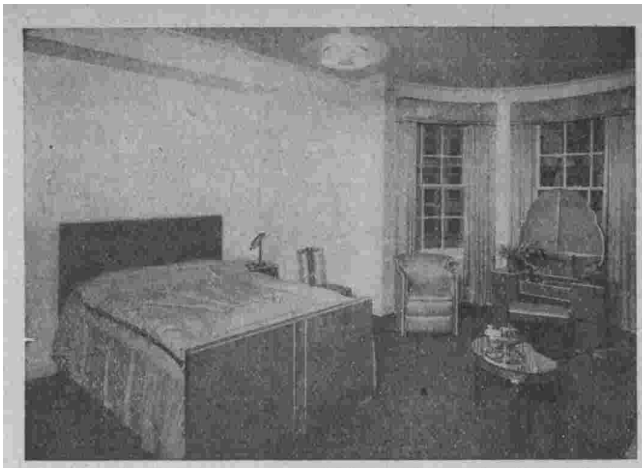
If wall-paper is used it should be of smooth surface so that dust can be removed. For the floor, parquet is always desirable, but ordinary boards can be made dustproof before staining by filling up the cracks. Linoleum is a clean floor covering, and easily swept and polished. Nothing more is required for the floor in a small room except mats which can be taken up and shaken. It is never advisable to have a carpet right up to the skirting.

The most important piece of furniture is the bed, and the best should be bought with the means at disposal. Bedspreads and day cushions can add to the colour of the room, in harmony with the curtains. In many houses hanging cupboards and cupboards with shelves are built into the walls, or built in flush with the wall, so that they form a kind of panelling.

The pedestal basin with hot and cold water is fitted into some houses, but the ordinary washstand is disappearing as a piece of furniture. A well fitted bathroom and a hall cloak room do away with the necessity of wash-hand stands in smaller houses.

For the larger bedroom a wardrobe which has a hanging cupboard on the one side, shelves on the other, and in the centre drawers and a cupboard may be chosen where there are no built-in fixtures. If space is limited a chest of drawers may be selected which will also serve as a dressing-table. A long mirror placed pannel-like between two windows, or elsewhere in a

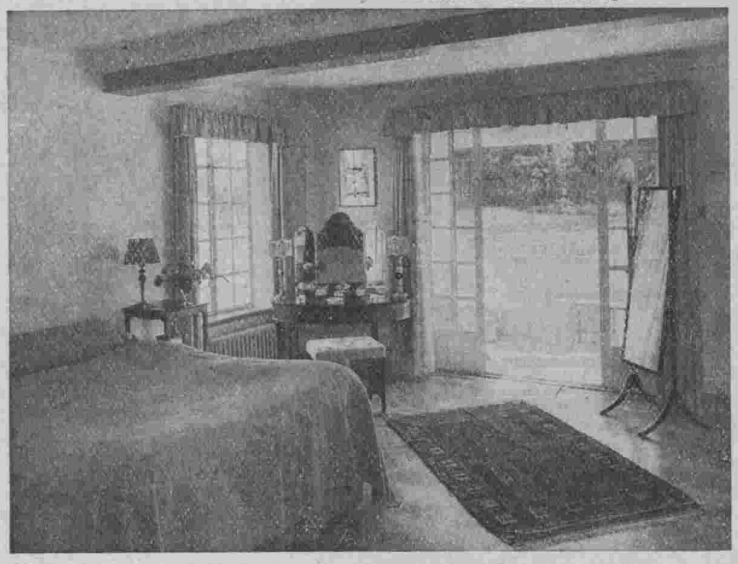
(*Continued in page 144)*





Ideas for the sleeping accommodation of two generations. Left, a mature suite in Burr Maple. Notice the kidney-shaped mirror and glass occasional table and accessories. Right, a bed-cum-workroom or " sitter " (in oak) for a young boy or girl ; the tallboy has an extending shelf for writing

Photos: Elsie Collins; courtesy John Barker and Hamptons





Classical lines and sophisticated modernity mingle attractively in these restful designs. Above, left, a " country " design. The furniture is not new, yet it harmonises. Right, a simple bedroom in unstained oak, using " unit " furniture, with a splash of colour in the striped bedspread



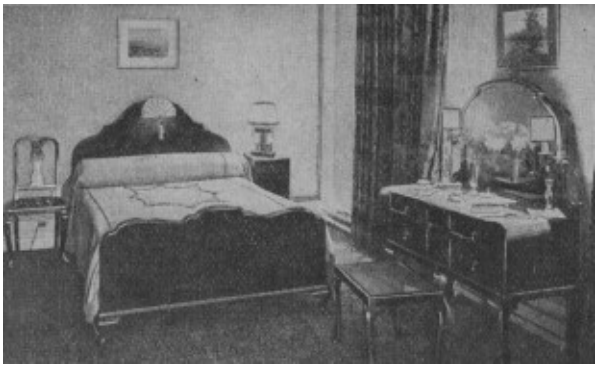


Here are two thoroughly modern and dignified arrangements. Left, old furniture and curtaining beside an up-to-date double divan. Right, an ingenious combination of exotic luxury and utilitarianism : the colour-scheme is off-white with " Empire " yellow. Notice the bedside cabinets with extending shelves, and the spacious and unusual window treatment

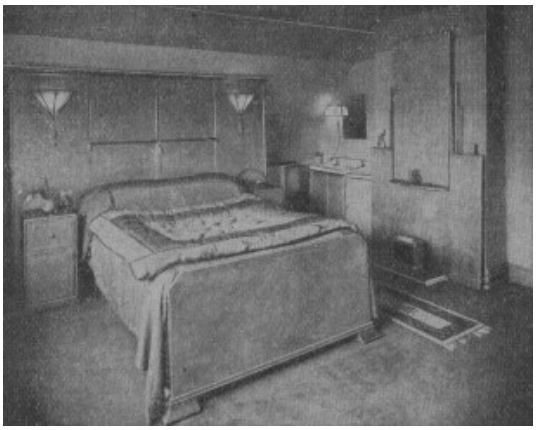
Photos: Elsie Collins; courtesy Bowmans, Julie Jacobs

BEDROOMS AND BEDSTEADS: SOPHISTICATED YET RESTFUL MODERN DESIGNS

good light, is a distinct addition to the room, as it catches and diffuses the light. It is of utmost importance to avoid overcrowding, but an armchair, small writing-table, and a couch are desirable additions, so that the occupant will be able to read, write, rest, study, or sew without disturbing or being disturbed by the rest of the household. In a small room, by the elimination of the washhand-stand, of the wardrobe in favour of the hanging cup-board, and of the dressing-table in favour of the bureau, there is usually space for a table and an easy chair, thus giving additional usefulness to the room as well as comfort.



Bedroom. Modern treatment in a town flat. Improved lighting, including lamp at bedhead.



Bedroom. Modern treatment in a town flat. Wardrobes with doors at ends and small cupboards composes the bedhead. (Courtesy of Rowley Galleries).

Well placed lighting is important for the mirror. Candle-lamps fixed to the dressing-table itself are convenient. A good reading-lamp is essential: either of the hook on to the end of the bed type, a pendant, or a standard. Ingenuity is shown in adapting the rest of the furniture to antiques. Where Jacobean chests are available the hangings and bedspread are of printed linens which reproduce the designs of the period. If the cost of a good modern copy of the Jacobean bed is too great, have a divan bed with legs and a head-board which suits the style of room. If the central piece of the room is a good eighteenth century chest or tallboy, a simple drop table with a reproduction of an eighteenth century mirror will serve as a dressing-table, and the window hangings may be in damask. For a room with painted furniture, hangings should emphasise colour and type of painted decoration. Placing furniture must depend upon the shape of the room. Fresh air is indispensable. The window should be kept open and the register of the fireplace should also be open, but the head of the bed should not be directly between the fireplace and the window, The dressing-table must be placed so that the mirror is in a good light.

In daily cleaning the bed should be covered with a dust-sheet to protect it. The carpet can then be gone over with the sweeper and the surround with the soft polishing mop. If the room has only small mats these can be removed daily and shaken. The room must then be thoroughly dusted. Once a week it should be turned out. A vacuum cleaner is helpful for carpet and hangings. All woodwork has to be dusted, particular attention being paid to the tops of furniture, curtain-poles, blinds, pictures, etc., which are out of reach in the daily dusting. Marble and tiles are washed, mirrors and furniture polished, and small rugs beaten.

The Invalid's Bedroom. The ideal position for the bed is between door and window; failing that, it should be placed between door and fireplace. A single bed is more convenient, and for any long illness a necessity, as a double bed adds to the fatigue and difficulty of lifting the patient, changing of sheets, etc. An iron bedstead about 3 ft. wide and not too low is best. It should bwe devoid of valances or curtains, and stand away from the wall so that the air can get to it from all sides.

All furniture, except essentials, should be removed. The best covering for the floor is cork carpet or linoleum, because it can be wiped over every day with a cloth wrung out in disinfectant. Even bare boards are preferable to a fixed carpet, and the necessary warmth and quiet can be procured by placing mats on the floor.

The top of the window should never be shut, and it should be possible to have the bottom open, too, for long periods at a time. If this places the patient in a draught a screen can be put round the bed. For purposes of ventilation a fire should be kept in night and day, unless the weather is exceptionally hot: not only does it ensure the chimney being clear, but it makes the temperature of the room easier to regulate. This should be from 60° to 65 ° Fahr., and kept even.

Heavy window curtains are unhygienic, but gaily patterned washable ones help to make the room bright and cheerful. Too many pictures, or too elaborate a wallpaper, are trying to the eye, and inclined to worry a patient. Plenty of flowers (not too heavily scented) should be kept in the room and should be removed at night.

There should be a comfortable chair or couch which the patient can occupy while his bed is being made, or when he begins to sit up.

BED-SITTING ROOM. One of the chief considerations is space. Accommodation must be found for clothes without introducing ordinary bedroom furniture. An antique style dressing-chest or a flat-topped bureau are useful pieces with long wall mirror conveniently placed. Two large cupboards are shown in

the illustrations, which provide in the one hanging room for clothes and space for bed linen, and in the other a sink for washing up and places for cooking utensils, etc.



Bed-Sitting Room. General view of the room which forms a complete flat. The cupboard on the left holds all domestic necessities, the one opposite all wearing apparel. The small gas cooker has a convenient shelf beneath.



The other side of the room above, showing the divan.

A divan bed may be covered in cretonne or silk, the cover lined to give weight. The pillows have covers to match or contrast. A day-bed with narrow head and foot-pieces and two bolster cushions at either end during the day may be substituted for the divan. Another type of bed is the settee bed, which has railings on one side and at the head and foot, and wired springs with an upholstered mattress. The cover should be removable so that it can be washed.

There are hanging cupboards described as hall cupboards, which do not look out of place in a sitting-room. The best type of table is the gate-legged variety of the drop-table, the leaves of which let down when not required. A gas fire is desirable, and also a small cooking stove, as shown in the illustration, but if there is a coal fire it is useful to have a gas ring in addition. *See* Bachelor Flat.

BED SORE. The cause of bed sores is the weight of the body constantly falling on bony points not well protected by fat. The chief sites are the heels, ankles, elbows and the lower part of the back. Beginning with slight redness, the affected area soon turns a dusky purple, and the soft tissues slough out or the skin ulcerates, leaving an angry sore.

The nurse should be vigilant in her efforts to prevent a sore forming. The sheet must be kept smooth and dry, any soiling being quickly attended to. Every day the skin of the back and other susceptible parts, having been washed with soap and water and thoroughly dried, should be sponged with methylated spirit and dusted when dry with talcum powder. If possible the patient should at least occasionally change his position. The mattress should not be a feather one, and if necessary a water-bed should be procured. Good results have been obtained by dry-rubbing the back with soap till the surface is quite smooth. If the skin becomes reddened it should be painted with flexible collodion. If the condition progresses and a slough is sepa-rating, fomentations may be applied in order to assist this.

These fomentations are made by wringing out clean napkins in a very hot saturated solution of boracic acid and should be just large enough to cover the affected area. They should be applied every two hours, being covered with oiled silk and a bandage to prevent too rapid cooling. When the slough has separated, wash the ulcer frequently with an antiseptic lotion and apply an ointment. Either of the following would serve: resin ointment and balsam of Peru, an ounce of each, or camphor gr. x., zinc ointment to an ounce.

BEDSPREAD. The bedspread should be in relation to curtains and carpet. While there is nothing daintier than the linen embroidered bedspread enriched with fine needlework of all kinds or by coloured border and large central appliqué design, linen bedspreads are not always favoured because of the cost of laundering or suitable for the style of the room.

For period rooms a selection should be made from printed linens, silks or satins which are in the designs nearest to the period. Chinese lacquer demands the beautifully designed silks of China, and if these are unobtainable the decorator may fall back on black or gold satin if matching the curtains, and trimmed with Chinese embroideries.

For ordinary purposes artificial taffeta the colour of the walls may be selected with a bold embroidered design introducing colours of curtains, etc.; or a patterned soft cretonne or print may be edged with casement cloth of the prevailing colour, or printed cotton bedspreads may be bought to tone with the room. *See* Appliqué Needlework; Embroidery; Linen.

BEDSTEADS: ANTIQUE AND MODERN TYPES
Their Choice, Construction and Repair

For the arrangement of the Bedstead see Bedroom; other associated headings are Bedding; Bed-Making: Divan; Mattress; Sheraton, etc.

The cheapest iron or brass bedsteads have the bars of head and foot placed transversely, but better types have the bars of the head and foot in a vertical position.

They may be obtained enamelled in black, in white, and in a variety of colours, or the brass may be lacquered. The best brass bedsteads have the minimum of decoration, and the uprights are square and not round in section. In cleaning these, only a soft polishing rag is necessary. Polishes of any kind should be used sparingly.



Bedstead of English oak, dated 1593, with finely carved pillars detached from the framework of the bed. (Victoria and Albert Museum)

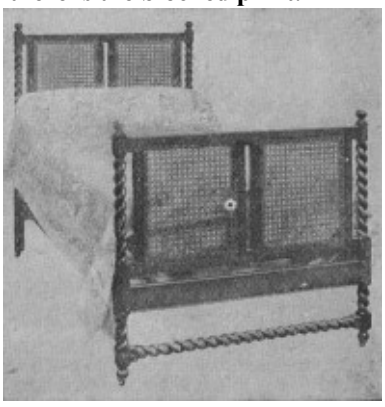
A wooden bedstead, with upright bars at head and foot, is the commonest type of bed chosen to go with plain or fumed oak furniture. The pattern can also be obtained in mahogany and in painted wood. If the bed is to stand by the wall it should always be provided with castors.

The cheaper kind of beds in the two foregoing types are of combination design, i.e. the wire-spring is fixed to the frame of the bed itself, screws allowing the wire to be drawn taut. It is better to choose a bedstead with iron frame complete, but without the wire. The wire or box-spring can be bought and superimposed.

For lasting value there is nothing better than the wooden bed with solid headboard and footboard made of mahogany or walnut. Where a finely marked piece of wood is used, it is in itself sufficiently decorative. This bed is a variety of what is known as the French bed.

Period wooden bedsteads are copies of old designs. A Tudor bed in dark oak will have a low footboard and two low posts at the foot, or no footboard at all; a Jacobean dark oak bed will have the twisted posts to be found in Jacobean furniture with upright bars at the head and foot; or if the solid head and footboard are chosen it will possibly have some carving. These Jacobean bedsteads have added strength by a transverse beam placed below the footboard. Good beds in inlaid mahogany in the Sheraton style can be had either with solid head and foot or with a central panel and upright bars.

A cane-panel bedstead looks right with furniture of 18th and early 19th century design, or with the lighter types of French furniture. The four-poster is an interesting revival, though hardly the most practical. It can be had either with or without the canopy. It is not necessary to retain the hangings behind the headboard, though this is usual. Curtains must be fixed so that there is no great difficulty in taking them down to clean and replace. The hangings are narrow, so that they do not prevent a free passage of air, but are only for decorative purposes. For the older patterns draperies of costly stuffs are in keeping. Models with twisted posts have Jacobean printed linen, or genuine embroidered hangings and an embroidered bedspread of the same pattern. For others hangings and bed-covers of silk or damask are chosen, and for the painted four-poster there is the blocked print.



Bedstead. Example in walnut with cane panels, adapted from a seventeenth century model. (Photo from Heal & Son, Ltd.)

All these beds are chosen for their decorative quality, and must be justified by choice of accessories. The Chinese four-poster, the most ornate of all, is made to accompany Chinese lacquered furniture in black, green or red.

The best model for a child's bedstead is one with half sides, which prevents all danger of falling out. These can be had in light and fumed oak, or in painted wood to suit the rest of the nursery fittings. In choosing a child's bed it is important to see that all the parts are solidly fixed, that the laths are solid, and cannot be displaced by the most energetic child.

A folding bedstead for the use of an emergency visitor is a useful addition to the household in a London flat or a country cottage. One wooden model, folding up on the concertina pattern, occupies a very small space when not in use, and the thin overlay can easily be stored in a cupboard. There are also several varieties of the military canvas folding-bed. These are provided with a stout canvas overall cover, and form a very useful part of the family holiday luggage.

For use in hot climates an iron or brass four-poster is the best type. No wood is used, as wood is accessible to ants and other insects. The high posts have the transverse rods connecting them fitted with secondary rods for the mosquito curtain, but these are not always used, as many people prefer the curtain to have no division between the canopy and the sides.

Between a wooden and a metal bedstead there is little to choose in the way of strength provided both are good models. The wooden bedstead has one possible point of weakness—where the iron angle-piece which connects the iron bed-rail with the wooden head and footboards is fixed by four screws into the wood. After years of hard service it is possible for these screws to become loose in the wood; it is then necessary to take the bedstead to pieces, plug the wood, and reset the screws. It is wise to count the cost of the spring and the

mattress before choosing the bedstead.

Repairs and Renovations. These are well within the capabilities of most amateurs, provided they exercise common sense and pay due regard to the nature of the work to be done to the damaged part, as this determines to some extent the method of repair.

Four-Poster Bedstead. The earliest English specimens are few in number, those which have come down from Elizabethan times being chiefly of Italian or Flemish make. They lost popularity in the 17th century, and remained out of favour until the time of Hepplewhite and Sheraton, who gave the type a lease of life that lasted well into the 19th century. Sheraton designed pieces are particularly graceful.

The majority of bedsteads of this type will be found to be more or less worm-eaten, and probably damaged. If the worm is still in the wood, it can be detected by the deposit of fine wood dust on the ground beside the part affected. It can be treated by injecting petrol into the worm holes by means of a very small syringe; a hypodermic syringe answers very well. Other effective methods are to steep the parts in turpentine or paraffin. The work is then cleaned and repolished, treating the worm holes with beaumontage (q.v.) or other filling.

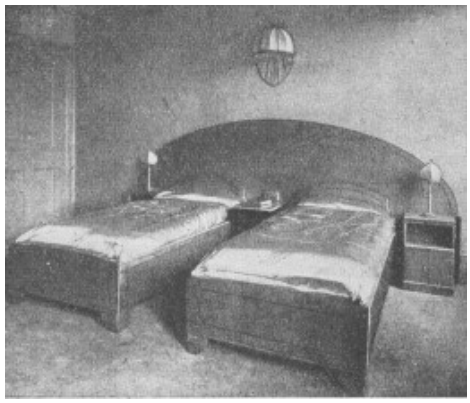
The joints were frequently held together with a form of coach screw; this will probably no longer hold in the wood, so bore out the hole, plug it with a well-fitting wooden plug, well glued into place, and drill out a suitable size hole for the screw. If the original canvas mattress is badly torn, either replace it with new or carefully patch and stitch together all the torn places, and re-work the holes for the lacing, using a buttonhole stitch. Probably only the old framework will be retained and a box-spring mattress fixed to it. All that is needed are some extra battens at the head and foot or elsewhere to support the framework of the box-spring.

Iron Bedstead. The usual failings of iron bedsteads are chipping of the enamel, rusting and tarnishing of the ornamental brass knobs and other parts, and breakage of castors. The paint work is readily dealt with by filling the chipped places with hard stopping, after cleaning the metal, and re-enamelling the whole framework. If the brass work is badly tarnished, or covered with a kind of black growth of spots, it is best to remove the parts— generally by unscrewing them— then boil in strong soda water to remove the remnants of the old lacquer. Polish with very fine and old emery cloth (that known as blue black is the best), then polish thoroughly with good metal polish, wash in hot water and re-lacquer. A good effect is often obtained by bronzing the brasswork, say, to blue-grey, and enamelling the metal work in a contrasting colour.

Missing castors are difficult to replace, as they are often cast on. One method is to cut off the old castor with a hacksaw, and drill out the end of the tubular leg. Obtain a new castor of similar size to the others on the bedstead and mount this on a hardwood, or preferably metal, plug that can be tightly driven into the hole of the leg. An alternative is to fix a tube to the castor, either by riveting or brazing (q.v.), and then fit the leg into the tube. A length of about 6 in. above the castor will serve the purpose.

All-brass bedsteads can be dealt with along the same lines, but the re-lacquering job is no easy one for an amateur, as the whole section must be done at one time and must be kept at proper temperature.

Wooden Bedstead. With the so-called sanitary iron fittings, wooden bedsteads sometimes give trouble by the failure of the screws holding the shoe or cast-iron fitment into which the side bars are fitted. The only remedies are to withdraw the old screws, plug the holes, glueing the plugs securely into place and fitting new screws. A drastic and effective remedy is to bolt the shoes on with coach bolts. The heads will, of course, be visible, but this need be no detriment.

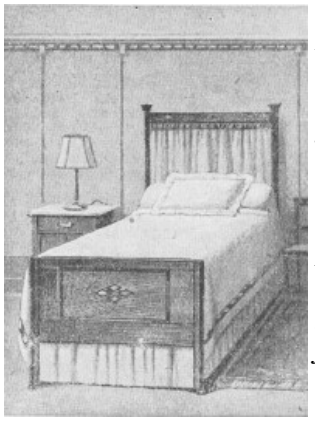


Bedstead. Modern design by Joseph Emberton, A.R.I.B.A. Twin bedsteads linked together by one large head board.

Sometimes it is desirable to alter the colour of a bedstead so as to harmonise better with the scheme of decoration. When the bed is an enamelled one, the treatment is obvious—re-enamel it in the desired tint. Many bedsteads are made of oak, birch, or similar material and then stained and polished. Here the old colour can to a certain extent be removed with methylated spirit or turpentine. Follow this with a careful rubbing down with fine glass paper Re-stain the wood with a good quality water stain of the desired colour (obtainable from an oil shop) and then re-polish, or even work up a gloss with a good grade of furniture polish.

Making an Oak Bedstead. The bedstead shown in Fig. 1 is intended for a room of moderate dimensions. It is a 3 ft. size, but the general character may be preserved in a 4 ft. 6 in. size, if a double bed is required, or a pair of 3 ft. bedsteads could be made to stand side by side as twin beds. Width, as stated, is 3 ft.,
but for a child's bedstead it is possible to get an iron frame with diamond mesh-wire spring combined 2 ft 3 in. wide. This hint might prove of service when space is

limited, the accommodation being sufficient for comfortable sleeping without much sacrifice in appearance with the low foot-end. The height is 2 ft 3 in., and may be as low as 1 ft. 10 in. for any special reason. The length of bed is governed by that of the separate iron angle sides or combined spring, whichever is fitted, the size usually supplied being 6 ft 4 in. Fig. 2 shows a type of dovetail iron socket used in conjunction with angle iron bearers to connect the head and foot of a wooden bedstead. The height of head end is 4 ft 3 in., giving a sufficient display of curtain.



Bedstead. Fig. 1. Single oak bedstead, the making of which is described in the text .

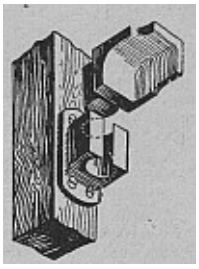
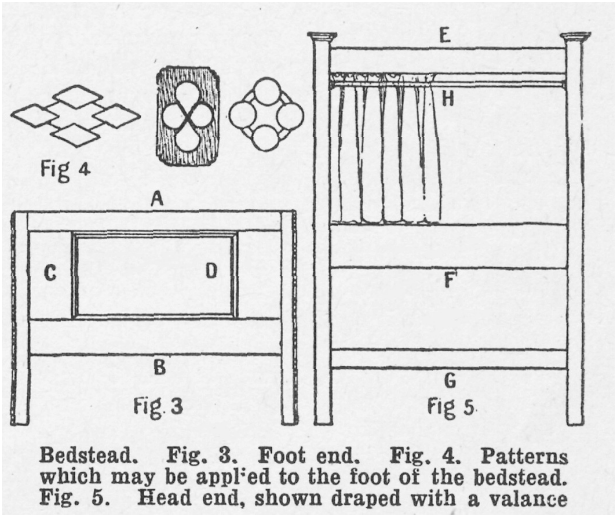


Fig. 2. Dovetail iron socket for angle iron bearers.



Bedstead. Fig. 3. Foot end. Fig. 4. Patterns which may be applied to the foot of the bedstead. Fig. 5. Head end, shown draped with a valance

A start may be made with the foot end. The posts, allowing 1½ in. on for height of castors, will require two lengths of 2 ft 1 in. by 2 in. by 2 in., finished sizes being a shade under for a stout bed. It is possible to use wood 2 in. wide on face by 1½ in. thick, if this happens to be more accessible. For the former size the posts are square for their full length, but have the corners just nosed off. A ¼ in. ovolo is intended to be worked down the outer angle, and this can be carved effectively with pip and-bean detail, or this ornamental portion can be obtained separately in long strips (about 10 ft.) from the woodworkers' sundries-man, ready for grooving into the corner of the posts, to be glued and fastened here and there by needle points. Castors are often omitted in a 3 ft size, in which case it should be remembered to allow the slight extra length for the posts.

The top rail (A, Fig. 3) is mortised and tenoned into position, but is often dowelled, or might be dovetailed in. It looks well if the top edge is slightly rounded away, D-shape. This rail is shown 2¾ in. wide, and should be at least 1¼ in. thick. The foot-rail (B, Fig. 3) enters the posts with a couple of shouldered tenons, and is 4½ in. wide.

The inner uprights (C, Fig. 3) take two pieces 12 in. by 6½ in. by 1¼ in., to include ½ in. tongues, entering top and bottom rails and uprights, and all three are grooved to receive the panel. The panel (D, Fig. 3) should be of ⅝ in. thickness, reduced at edges to enter the ½ in. or ⅜ in. grooving. A flat section of mould can then be mitred up to drop in on face and be glued and pinned.

This finishes the construction of the foot end, but if some relief is required the left-hand device at Fig. 4 might very well be introduced into the centre of panel. It is easily set out and cut from a piece of ⅛ in. thickness for the centre diamond, this being notched for the smaller diamonds out of ¼ in. material to intersect. Size for the device to finish is 8 in. by 4 in., and in mounting care must be taken to get the extreme points level. The easiest way is to pencil in centre lines on the panel, and glue up the pieces over these, the final being by the addition of a few needle points. The right-hand device is an alternative. The centre device is cut from a piece of ¼ in. material cleaned up, with a four circle and crossbar opening, and the corner shaped ogee to form a centre panel. This last device would be very suitable if the bed were made in dark mahogany.

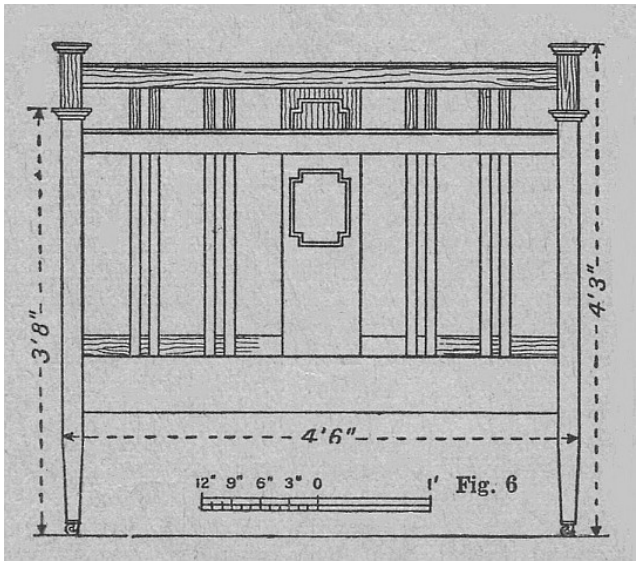
The head posts (Fig. 5) are 2 in. by 2 in., and are shown with 4 in. by 4 in. moulded cappings stub-tenoned on. It will not be necessary to introduce the pip-and-bean mould on the angle of the posts as for the foot-end. The top rail (E) is 3½ in. wide, which will afford an opportunity of applying some relieving device in keeping with the foot-end. The mid rail (F) might be 2 ft 6 in., or a trifle higher; width is allowed 6 in.; thickness of both this and the top rail (E) should be 1 in. The lower stretcher rail (G) can be 2½ in. by 1 in., and can be fixed anywhere between 6 in. and 10 in., from lower end of posts.

The curtain rod (H, Fig. 5) can be of ½ in. brass tubing, and special fittings are obtainable in brass for a small sum from most furnishing firms.

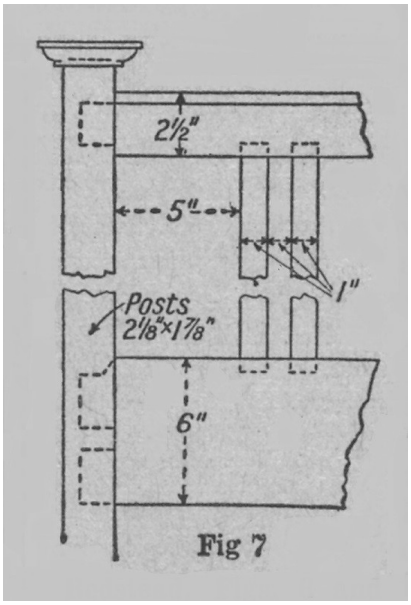
Details are given in Figs. 6 and 7 of a 4 ft. 6 in. bedstead of straightforward design. The woodwork, as in the bedstead described above, consists only of the head and foot, which are joined by dovetail sockets and angle iron sides. The posts, which are finished off with a moulded capping, are 2⅛ in. by 1⅞ in., the rails are 1 in. thick, and the central splat ½ in. thick. The upright slats are 1 in. by ½ in. The top edges of the upper rails are finished with a moulding, as shown. The panel on the centre splat is formed with a small moulding, which may be pinned and glued.

The posts for the head are 4 ft. 3 in. high over all, including castor and capping. The latter is planted on, and has an ovolo moulding worked on its edges.

The height of the foot posts is 3 ft 8 in. over all. The extreme width of the end, measured over posts, is 4 ft. 6 in. The upper edge of the lower rail for the head end is 1 ft 9 in from the floor, that for the foot being 2 in. nearer the ground. These rails are 6 in. wide, and the top rails are 2½ in. wide. The central splat is 8 in. wide; the 1 in. vertical slats are in pairs, as shown, spaced so as to leave intervals of 5 in. The dovetail sockets are attached so as to bring the angle-iron sides 1 ft. 3 in. from the floor.

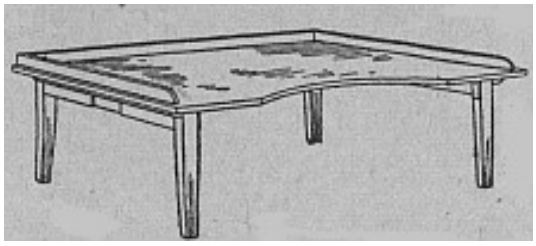


Bedstead. Figs. 6 and 7. Simple design in oak, with working diagrams.



This design can be readily adapted for a single bed. The overall height of the posts for both ends might be 3 ft, and the overall width of the ends from 2 ft 6 in. There would be a single pair of upright slats each side of the central splat. If a pair of twin bedsteads is made, the head ends might be taken a little higher than the foot.

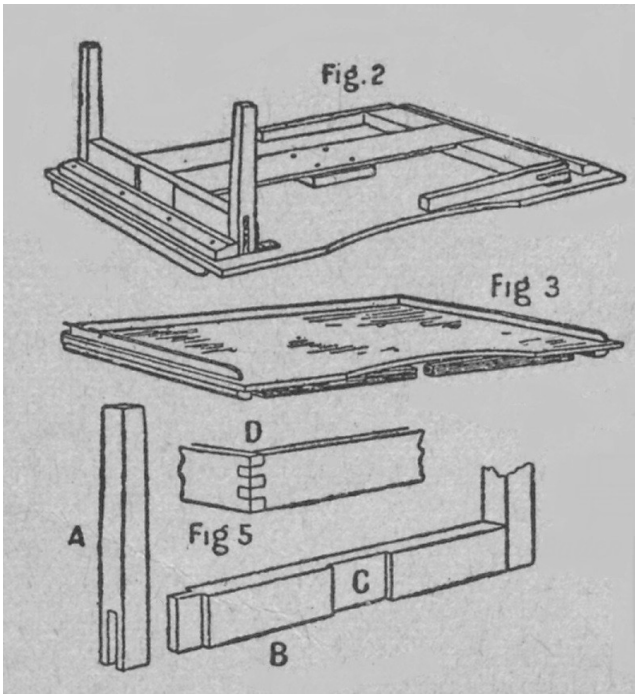
BED TABLE: For Invalids. The bed table shown in Fig. 1 has a double advantage. The legs are hinged so that the article may be converted into an ordinary tray. By means of a very simple contrivance (Fig. 2) the legs are held down firmly, so that the tray will stand flat on a table or sideboard. When the legs are unfolded for bed-table use the same arrangement provides for them being held rigid. A tray of this kind may be made in almost any wood. American whitewood, or even pine, will serve the purpose. For a stronger article oak may be used, or if a specially nice piece of furniture is wanted, mahogany may be taken.



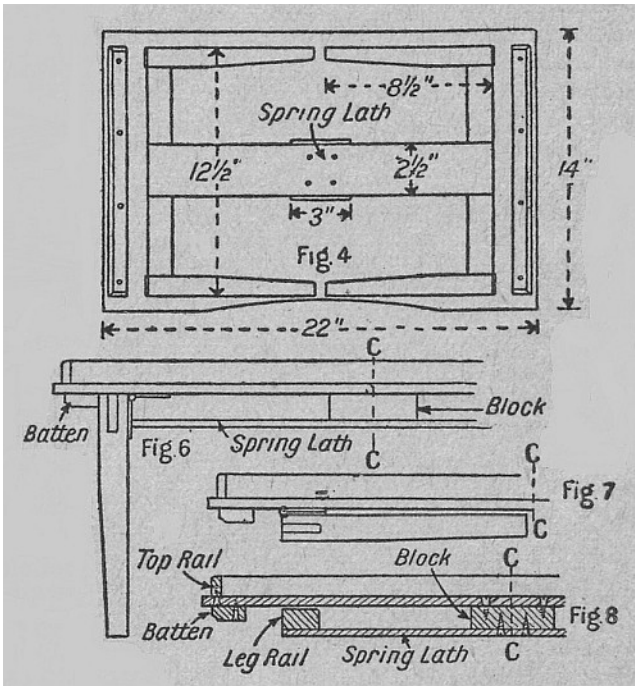
Bed Table. Fig. 1. Folding table for invalid use.

The size suggested in Fig. 4 is a tray measuring 22 in. by 14 in. This might be reduced to 20 in. by 12 in., with proportionately shorter legs, if only a small tray were wanted; or could be increased to about 28 in. by 18 in. for a patient who was likely to do much writing in bed. The legs are shown, 8½ in. long, which places the table at a convenient height.

Fig. 1 shows the bed table ready for use. At Fig. 2 is given a view of the underside, one pair of logs being up, while the other two legs are shown folded with the spring lath holding them down. Fig. 3 shows the article when used as a tray, while the scale plan at Fig. 4 will be a guide for sizes. The remaining sketches show details of construction.



Bed Table. Figs. 2-8. Working drawings by means of which the amateur woodworker can make it.



The top may be in one piece, 22 in. by 14 in. The thickness for pine or American whitewood may finish ⅜ in., but if oak or mahogany is used, 5/16 will do. A good sound board of ¼ in. 3-ply would serve the purpose for a light table. The front of tray may be gently curved inwards as shown.

To the underside of the top at each end are screwed two battens, which may be 12½ in by 1 in. by ½ in. thick. These should be chamfered on the outer edge (Fig. 6) and at the ends, and each is held with four brass screws. A rail is required for the back and sides of tray. The height may be ¾ in., with a finishing thickness of 5/16 in. At the corners the rail may be simply notched, as Fig. 5, D, or dovetailed, or mitred and keyed. The top edges should be gently rounded, and the front ends of the side rails neatly finished off, as in Figs. 1 and 3. The rails are screwed with fine screws passed in from below, this being done before the battens are fixed.

The legs are 8½ in. long and 1 in. square, and are shown tapered on two sides. The leg rails shown in Fig. 5 (A and B) are fixed with an angle bridle joint. They are 1¼ in. wide by 1 in. thick. The outer side of each has a shallow piece cut away to take the spring lath when the legs are folded. This is shown in Fig. 2, and also at Fig. 5 C. The part thus cut off will be 2½ in. wide and 3/16 in. deep, and must be in the centre of the rail. The cut provides for the spring lath lying flush with the legs when the article is used as an ordinary tray, so that the tray lies quite flat when the legs are folded down. Each pair of legs is hinged to the underside of the tray as shown in Figs. 6 and 7. The perspective sketch (Fig. 2) and the plan (Fig. 4) will also assist the worker. Strong back-flap hinges, 1½ in. by 1 in., are used. They are so fixed that the legs, when up, will lie against the flat ½ in. edge of the batten. It is important to note this, as if the legs stood away from the batten, the hinges would gradually loosen.

The spring lath holds the legs secure both when up and down. It is approximately 17½ in. long, but allowance should be made for a little adjustment when fitting. In width it may be 2½ in. or 2¾ in., and in thickness 3/16 in. or ¼ in. bare. If the table is made in pine or American whitewood, it will be desirable to use sycamore or ash, or any other wood which yields a good spring, for the lath. If oak or mahogany is in use, the same wood may be taken for the lath.

BED-TICK. For a feather bed and for pillows and bolsters an all-linen tick of a close weave should be chosen, and the sewing must be close and strong; otherwise feathers and down will escape when the outer covering is removed. For hair and wool mattresses it is safer to choose a stock pattern, as when mattresses are re-made there is usually a certain amount of shrinkage and new tick may have to be added. *See* Feather Bed; Mattress; Pillow; Ticking.

BEES AND BEE-KEEPING

How the Amateur Apiarian May Secure Profitable Results

Instructions for making Beehives are given in page 159. See also Bee Pest; Beeswax; Honey, etc.

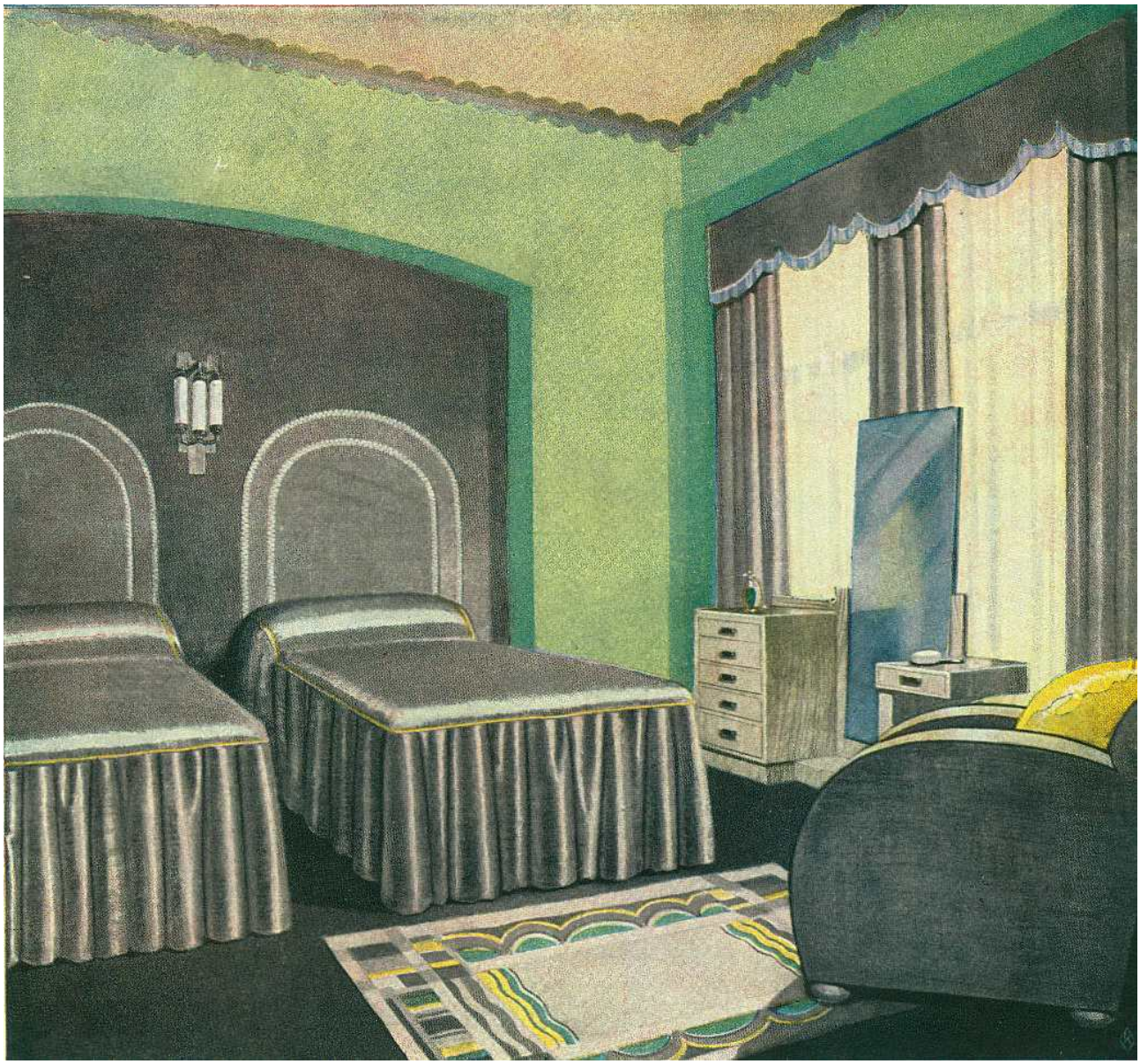
Bee-keeping is eminently suitable for smallholders, cottagers, and others with a limited area at their disposal. The prospective bee-keeper should begin with not more than a couple of stocks, increasing the number as he acquires experience. The following instructions on bee-keeping are based on information given in Bulletin No. 9 issued by the Ministry of Agriculture.

A stock resulting from a cross between the English, or so-called Black Bee, and the Italian, or Ligurian race, will probably be found the best; but on this point it would be well to take the advice of an experienced bee-master in one's own neighbourhood. A normal colony of bees consists of the queen, a large number of workers, which are rudimentary or undeveloped females, and a few male bees or drones. A swarm is a mass of bees, frequently numbering 20,000, with a queen. The first swarm from a hive is, as a rule, much larger than succeeding ones.

Bees thrive best when protected from frequent variations of heat and cold, and a steady temperature can only be maintained when the walls of the hive do not conduct heat. If they do this in summer the warm sunshine will soon make the interior of the hive excessively hot in the daytime. During the cool summer nights the reverse will be the case. In winter, when the temperature of the air outside is constantly lower than that inside, a steady loss of heat from the bee cluster occurs. This often results in the death of the bees from exposure and starvation, although ample food may be accessible.

A double-walled hive of sound pattern is that called the "W.B.C." Fig. 1 shows the arrangement of this hive, full instructions for constructing which are given

(*Continued in page 152*)



BEDROOM: UPHOLSTERED IN SOFT-COLOURED VELVET

Restful shades of green and grey make this bedroom scheme peaceful and soothing. The walls are apple green, with a metallic grey edging: the ceiling is a paler shade of green. The furniture is in modern grey-wood, the upholstery and bedspreads of grey velvet. The colour scheme is accentuated by the mat, with its modernist design, against a background of plain grey carpet. A note of warmth is struck by the rich yellow cushion in the armchair.

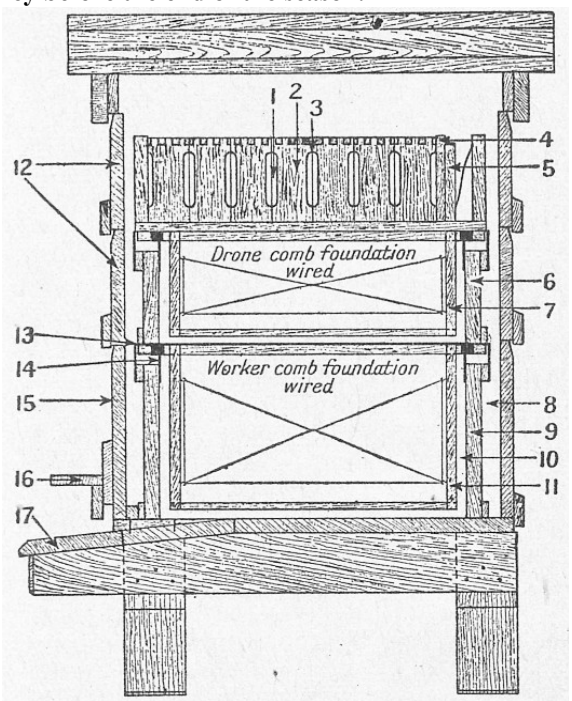
in the article Beehive. It consists of a floor board having having four splayed legs, and a brood chamber containing ten frames with a division board. These frames hang by ears or lugs on a metal runner, so that there is a space of ¼ in. between the end bar of the frame and the side of the hive. This is a bee space, and therefore left clear. Between the bottom bar and the floor board ½ in. space allows the bees free passage, and they are also able to clean out in comfort the dead and any dirt which accumulates. Their natural instinct teaches the bees to leave this space open, and they therefore do not build comb there.

To obtain combs of the right thickness for brood rearing, i.e. ⅞ in., metal ends are fitted on to the lugs of the frames; these are 1½ in. wide, so that when they are in position, and all the frames are pushed together until the metal ends touch each other, there is a space of 1½ in. from the centre of one comb to the centre of the next, allowing for ⅞ in. comb and a ⅜ in. passage between each comb to accommodate the bees when carrying out their work in the summer, and to cluster in during the winter.

To compel the bees to build their combs in the frames they are provided with comb foundation. This is pure beeswax, in sheets impressed with the base of the cells. By its use straight combs can be obtained in any desired position. To make the brood comb strong, wire is first stretched across the frame; a sheet of worker base foundation cut to fill the frame is then inserted into the saw-cut made in the top of the frame for this purpose, and a serrated grooved wheel, called a spur embedder, is then heated in the flame of a spirit lamp and run along the wire, thus melting the wax slightly in order that the wire may sink into it. This holds the foundation rigid, and when the comb is built the wire is right in the centre of it, and there is very little fear either of the comb dropping out if held in the wrong position, i. e. horizontally instead of vertically, or of the combs breaking down, should the hives be sent any distance. The combs in these frames are reserved for the rearing of young and the storage of winter food, and should not be touched for surplus honey.

The Structure of the Chambers

A second chamber, or super as it is termed, contains shallow frames, the combs in which are used for the production of extracted or liquid honey. The third chamber is a section rack containing 21 sections (bottomless wooden boxes 4¼ in. square by 2 in. wide) in which comb honey is produced. Each section holds about a pound of honey. Surrounding these chambers and the brood chamber there is an outer case which also carries the porch over the entrance; the size of the latter is registered by sliding doors. There are also lifts which fit on to the top of the outer case, and on one another to accommodate the supers during the honey season. A roof completes the structure. The hive should be stocked as early as possible in the spring. It may be populated in three ways: by purchasing a colony of bees, a nucleus, or a swarm. The first is the most expensive method, as the bees have already built the combs, are rearing broods and have stored a certain amount of food. A nucleus consists of four combs, and under favourable conditions may be worked into a full colony in time to give a limited amount of surplus honey before the end of the season.



Bee. Fig. 1. Section of double-walled W.B.C. Bee-hive. 1. Bee way. 2. Section. 3. Metal divider. 4. End following board. 5. Spring block. 6. End of shallow frame box. 7 Shallow frame. 8. Air space. 9. End of brood chamber. 10. Bee space between frames and hive side. 11. Brood frame. 12. Lifts. 13. Queen excluder. 14. Metal runner for frames. 15. Outer case. 16. Porch. 17. Alighting board. (By permission of the Ministry of Agriculture)

The safest way for a beginner to start is with a first swarm (not a cast, or after-swarm). The most satisfactory method of purchasing a swarm is by weight. A swarm weighing 5 lb. should be obtained, if possible. After-swarms weigh about 2 lb. and have a virgin queen.

The swarming season varies somewhat in Britain, according to the weather. There has been, in a very early season, a swarm on the 19th of April, the earliest in a 40 years' experience in the south of England. As a general rule, however, the latter part of May is the busiest portion of the swarming season, extending as it does through June and into July. Most of the swarms issuing in July are casts or second swarms, and, except in the hands of an expert keeping many colonies, are of little use and should be returned to the parent colony.

When the box or skep containing the purchased swarm arrives, it must be placed in the shade near the hive the bees are to occupy. If the swarm is in a box, the box should be placed upside down and the screws fastening the lid taken out. The lid should then be wedged open at one end about ½ in. to allow the bees to fly. If the bottom is of perforated zinc it should be

covered with a sack to exclude the light, otherwise the bees may escape. If the swarm arrives in a skep, the cording and wrap should be removed, and the skep placed on a board with a stone under one edge in order to allow of flight and ventilation.

How to Hive a New Swarm

The hive must be made ready before the arrival of the swarm, and should face southeast. An ideal situation is by the side of but not under a standard fruit tree. The legs of the stand should rest upon bricks to prevent them from rotting. The hive must be set perfectly level from side to side, with a downward inclination of about ½ in. towards the front. In the early evening the roof, lifts, and outer case should be removed. To prevent the bees ascending to the roof a thin quilt of ticking or unbleached calico is placed over the frames. The front of the brood chamber should be raised from the floor board about an inch by means of two wedges. A board the width of the alighting board should then be placed in front of and level with the latter, sloping down to the ground. Both boards are covered with a cloth hanging over the sides to the ground, to stop the bees from crawling underneath.

The skep or box is gently carried mouth downwards until it is just above the sloping board. With a smart jerk the bees are thrown out in front of the brood chamber, about 1 ft. away from the entrance, when they will at once begin to take possession of their new home. It is their natural inclination to run uphill. As they run in watch should be kept for the queen, to see that she enters safely. When all are in the wedges should be taken away and the front of the brood chamber gently lowered to its proper position. Any bees in danger of crushing should be brushed away with a feather.

The swarm will benefit greatly if it is fed for at least a week with warm, thin syrup, made by adding three-quarters of a pint of water to one pound of white cane sugar, and heating it over the fire until the sugar is dissolved. Add a teaspoonful of Bacterol to each pound of sugar. It is administered by means of the bottle feeder, Fig 2. Brown sugar must not be used. On the second day after hiving, the bees are closed by means of the division board on to the number of frames of foundation which they are able to cover.

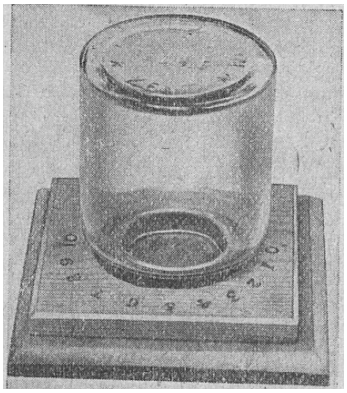


Fig. 2. A nine-holed bottle feeder.

If the swarm has been obtained early in the season building up will proceed fairly rapidly until all the combs are completed, and brood rearing will be carried out on such a scale that the hive will become overcrowded with bees before the honey flow is over. If this is allowed to continue the bees will swarm.

Swarming can be prevented to a great extent. Remove the quilts and place a queen excluder in position over the brood frame tops. This is perforated with slots made so accurately to size that the workers can pass through, but not the queen. Thus honey, without intermingling of brood or pollen, is obtained in the super that is now put on. If it is a shallow frame super, the frames should be fitted with sheets of wired drone base foundations.

When the combs in the first super put on are drawn out, and about two-thirds of the whole are filled with honey (i. e. when the bees commence to seal over the honey in the middle of the central combs), the super should be lifted and a second one placed underneath it. When the honey flow commences to decline it is better to allow the bees to complete those supers already in situation than to give extra ones.

Clearing the Supers

The bees are cleared from the supers by means of an escape, Fig. 4, which allows the bees to pass through a hole into a passageway in which there are two springs placed in a V-shaped position. This escape is fitted into a clearing board, Fig. 5, cleated so that it entirely covers the top of the brood chamber. The clearing board, with the escape in position, is placed in the evening under the super or supers which it is desired to remove. The only means of exit for the bees is from the wide ends of the springs in the escape, which are so finely adjusted that the bees can push them apart to pass out at the points, but are unable to return when the springs are closed.

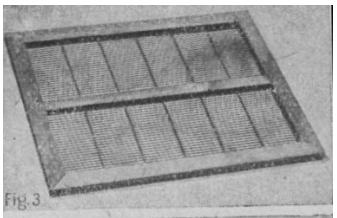


Fig 3

Bee. Fig. 3. Shallow frame super perforated with slots of a size to exclude the queen.

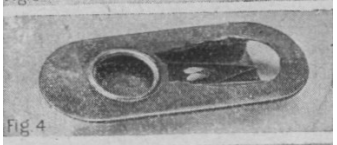


Fig 4

Fig. 4. Bee escape, the V-shaped springs only permitting egress.

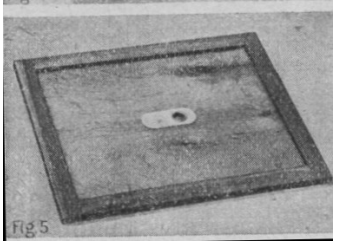


Fig 5

Fig. 5. Clearing board fitted with bee escape.

The honey in the shallow combs must be extracted as soon as it is removed from the hive, while still warm. The extractor, Fig. 6, is a tin cylinder with an inside cage revolving on a spindle when the handle is turned. The cage will accommodate either two combs, one on either side, or twelve sections, six on either side.

The first operation in extracting honey is to uncap the combs with a special knife or an ordinary sharp carving knife. A jug, the depth of the length of the knife blade, is filled with hot water and the knife inserted. If

a cold knife is used it will spoil the comb. The cappings are removed by cutting upwards from the bottom of the comb with a see-saw movement.

Two combs are placed in the cage and the cage is turned slowly. When a portion of the honey has been extracted from one side, the combs are reversed, and the other side treated in a similar manner. Extraction is completed by revolving the cage more rapidly. When the honey in the bottom of the extractor reaches to the cage, it is drained off and strained through muslin into 28 lb. tins or other suitable vessels.

The wet combs are now given back to the bees to clean down. The clearing board is left in position over the colony, and the tin slide over the hole on the front side of the board is withdrawn so that the bees can pass freely up into and down out of the super. When the empty combs are quite dry, the tin slide is pushed back over the hole, so that the only exit for the bees is through the escape.

The most profitable system is to work for extracted honey. It takes from 10 to 20 lb. of honey to make 1 lb. of beeswax, so that when a section is sold the bee-keeper parts with a valuable asset in the form of wax.

At the close of the honey season the keeper should see that sufficient stores have been left in the body box for consumption by the bees throughout the winter. A knowledge of the amount or weight of stores can be gained by tilting the hive at the front; if it feels like lifting from 15 to 20 lb., there is a sufficiency; but if it feels light they must be fed until it does so feel. To feed them, place a piece of perforated zinc, 5 in. square, of a gauge similar to that used in a meat-safe, over the feed hole already made in the quilts. Fill a 3 lb. glass jam jar with syrup made as directed for the swarm, but using only half a pint of water to the pound of sugar. Cover the mouth of the jar with two thicknesses of muslin and invert it on the zinc.

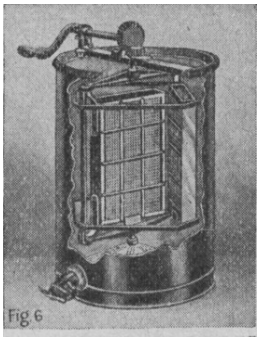


Fig. 6

Bee. Fig. 6. Extractor for withdrawing honey from comb by rotation.

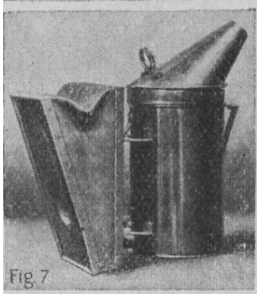


Fig. 7

Fig. 7. Bee smoker with bellows.

As the bees empty the jar, replenish it with syrup until they have had sufficient by weight. There will then be a perfect colony or stock to commence the next season. Should there be any doubt as to the sufficiency of the syrup to last through the winter, a cake of bee candy should be placed over the frames.

The chief attributes necessary for handling bees successfully are a knowledge of the habits of the bee, firm but gentle movements, adequate protection of the manipulator and proper subjugation of the bees. The only protection necessary is a veil for the face. This can be made of black mosquito netting, with an elastic band top and bottom, fitting tightly round the crown of the hat and under the collar of the coat to prevent the ingress of the bees. Gloves should not be worn, as they conduce to clumsiness, which will irritate the bees.

Subjugation is carried out by frightening the bees. When frightened they gorge themselves with honey, and are not inclined to sting. One of two subjugators can be used— a smoker (Fig. 7) or a carbolic cloth. The former consists of a tin cylinder having a conical nozzle, open at the pointed end. This is fastened to a pair of bellows with a connexion between the two at the back. Ordinary thick brown paper, corrugated paper, or fustian is rolled into a cartridge, lighted, and placed in the furnace of the smoker, with lighted end downwards. When the bellows are worked a volume of smoke is emitted from the nozzle and can be driven in any direction. A carbolic cloth is made by sprinkling a piece of calico the size of the quilt with a solution of one part Calvert's No. 5 carbolic acid to two parts of water.

When manipulating it is inadvisable to stand in front of the hive. When handling or turning the combs, keep them vertical and not horizontal. Bright, warm weather should be chosen for manipulating bees, as they are then usually in a good temper.

Economics of Bee-Keeping

The strength of a healthy coiony depends on the vigour and laying power of the queen, who is at her best in her second season, and should be replaced in the third by a young one. The economy of a hive depends on: (1) the generation and keeping up of the warmth of the brood nest (by means of the heat evolved from the bodies of the clustering bees) to such a point as will stimulate the production of eggs and enable young bees to be reared; (2) the nursing of the larvae, and the cleansing of the cells, for the queen to lay in; (3) the collection of pollen, water and nectar for food; and (4) the building of storage combs and collection of nectar for future supplies of honey.

The aim of the bee-keeper is to keep his colonies strong. The crowded condition of the hive should be secured at the right time—i.e. at the honey flow. Honey is made from the nectar of flowers. Spring and early summer are the times when the honey crop is gathered. There is a period every year, varying in each district, when the supply of nectar is most abundant. This time, should be ascertained by the bee-keeper, who will then stimulate his colonies beforehand.

Bees are thirsty insects, and at the end of February a shallow pan half-filled with washed stones should be placed at a distance of four or five yards from the hives. This should be partly filled with water to which table salt has been added in the proportion of one teaspoonful to a pint. The tops of the stones should be left dry for the bees to alight on.



Bee. Shaking a swarm from branch on which the bees have settled.

BEECH. One of the chief uses of beech wood is for chairs. Most of the bent-wood variety are of beech, and so are the Windsor and other non-upholstered chairs. The frames of upholstered chairs and couches are often of beech, if they are not of birch; also turned table legs and many other turned articles. Beech may be stained to resemble mahogany or walnut. It is used for tool handles and for mallets and planes; sometimes for wood-worker's benches and dowel rods; also for brushes, and rollers for wringing machines and mangles. Beech is a heavy wood with straight and close grain, light in colour, sometimes with a reddish tinge. *See* Chair.

BEEF AND HOW TO COOK IT

Helpful Information about the Joints and Tested Recipes for their Preparation

For general cooking methods see Baking; Boiling; Braising; Roasting; also specific cuts as Brisket; Sirloin; Steak, etc.

Grass-fed, short-horned cattle provide the best beef on the English market. Cow-beef is not so tender or well-flavoured, but is sold at a lower price. Chilled beef is superior to and a little more expensive than the frozen meat imported from abroad. It may require to be slowly thawed before being put in the oven, and is wholesome and tender if properly cooked.

If raw beef is pale pink or purple the animal has not been in good condition; a clear red indicates health. If the fat is streaky, giving the beef a marbled appearance, the animal has been in prime condition. The fat should be without brown spots or streaks of blood. The flesh should feel firm and elastic. There is no disagreeable odour from good meat. After keeping it at home for a day or so, washing with diluted vinegar will restore freshness. Meat that is in prime condition does not get watery on standing, nor lose much juice in the process of cooking.

The Parts of Beef and Their Uses

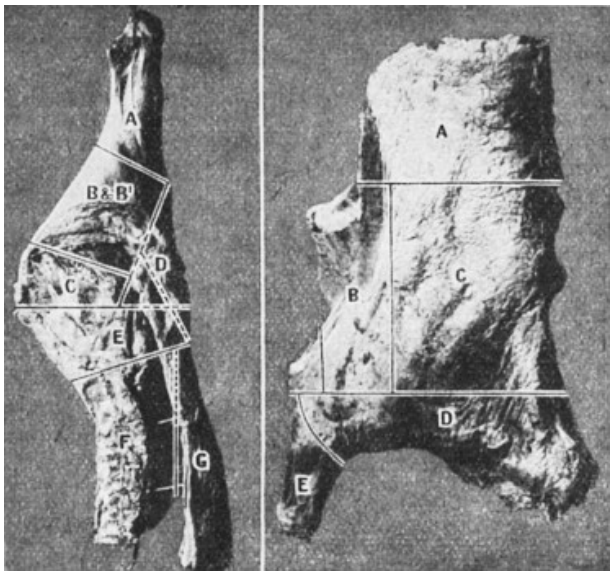
The hind parts of a bullock are the most expensive. Sirloins and ribs are used for roasts: the rump gives the best steaks for broiling. The topside of the buttock is useful tor roasting or gives good stewing steaks. The silverside or underside is usually salted and boiled, as is also the brisket, which is a cheap joint. The aitchbone (buttock) is cheap and used mostly for boiling. Flank of beef provides good steaks for pies. The leg and shin are used for soup and also for potted meat. Cow-heel makes a jelly as good as calves-foot jelly.

Oxtail is stewed or made into soup. Tripe is the ruminant stomach of the ox, and is easily digested. The heart, liver and kidneys are moderately digestible. The sweetbreads of an ox require long and careful cooking. The suet around the kidneys is specially good for the finest of cookery uses.

When a joint of meat is kept for a few days it should be wiped and hung up in a cool, dry place to which flies have no access. The undercut of a sirloin may be taken off and used separately for beef olives or fillets of beef, thus giving an extra hot dish out of the joint.

Boiled Beef. Choose a salted round, aitchbone, brisket, or silverside, and tie it into a shape convenient for carving. Put it into a pot with just enough water to cover—cold water if the beef is very salt, otherwise warm. Bring the water slowly to the boil, and then add two onions, several carrots (cut lengthwise into pieces), some sliced turnips, and some herbs. Let the beef simmer, but not actually boil. Make some small suet dumplings and boil with the beef. Allow 25 min. for each lb. the joint weighs and 25 min. over. Serve the beef on a hot dish, pouring over it a cupful of the water in which it was boiled. Garnish with vegetables and dumplings.

These are made with 6 oz. flour, 2 oz. suet, 1 small teaspoonful salt, ¼ teaspoonful baking-powder, and a little water or milk. First the suet is chopped and mixed lightly with the flour, baking-powder, and salt; then all are bound together with the water, kneaded lightly and made up into soft balls of dough, which are cooked during the last 15 min. the meat is boiling. Serve at once, otherwise they turn heavy.



Beef. Quarters marked off to show how they are cut for market. 1. Hind-quarter. A. Leg. B. Topside. B1. Underside. C. Aitchbone. D. Thick flank. E. Rump. F. Loin. G. Flank. Dotted lines show direction of cut on the other side. 2. Forequarter. A. Fore-rib. B. Brisket. C. Middle piece. D.Clod and Sticking. E. Shin.

Braised Beef. A round of beef is the most suitable. Flour the meat lightly and brown in a saucepan in hot fat. Add a teacupful of hot stock, salt and pepper, a little mace or nutmeg, any sliced or chopped vegetables, 6 or 8 peppercorns, 2 cloves, and a little parsley. If no fresh celery is available, add a little celery seed and a teaspoonful of dried herbs in a muslin bag. Cover and cook gently till the meat is tender, laying a piece of greased paper over it to keep in the steam. A couple of Spanish onions, boiled for a few minutes and then quartered, may be added to the braise. Place the meat on a hot dish, strain off the liquid, arrange the vegetables in four heaps round the dish, and pour some of the gravy round, serving the rest separately.

Roast Beef. Ribs of beef are often boned and rolled before roasting. Rounds and aitchbones can only be roasted successfully if very tender. Put in a very hot oven and reduce heat after first 10 minutes. Give 20 minutes to each pound, and 20 minutes over. The roast should be served on a hot dish with pieces of Yorkshire pudding, horse radish sauce, and gravy separately served.

Rolled Beef. Procure a large steak cut from the topside of beef, weighing about 2 lb., and cut about 1½ in. thick. Wipe and flatten slightly by beating with a rolling-pin or a cutlet-bat dipped in cold water. Remove the skin from ½ lb. of raw pork sausages, mix the sausage meat with 2 oz. fresh white crumbs, 2 teaspoonfuls chopped parsley, a dust of powdered herbs, a little salt and pepper, and one well-beaten egg. Spread this forcemeat evenly over the beef, but not within ½ in. of the edges.

Roll up the beef, bind in shape with tape, put in a baking-tin with 2 oz. of beef dripping and a teacupful of water, and bake in a moderately hot oven for about 1¼ hours. Baste frequently, and if the dripping smokes, add more water. When cooked remove the tape, place the roll on a hot dish, and strain round it about ½ pint of hot tomato sauce. If liked, a veal forcemeat of crumbs, suet, and herbs can be used instead of the sausage filling.

Stewed Beef. Trim 2 or 3 lb. of meat, tie neatly, and lay in an earthenware dish. Then boil 1½ gills of vinegar together with 2 teaspoonfuls mixed of allspice, cloves, and mustard seed for 5 min. and pour over the beef. Leave in this marinade for 2 hours, and turn occasionally. Cut 4 oz. bacon into large cubes; melt 1 oz. of beef dripping in a saucepan, and fry the cubes lightly. When done, lay them on one side and put the beef into the hot fat, letting it brown well.

Lift the beef out of the pan putting in its place slices of onion. Fry these, and add 4 oz. of whole new carrots. Lay the beef on these vegetables, add 1 quart of stock, a small bunch of herbs, and a few spring onions. Cover the pan and simmer contents for two or more hours, until the meat becomes tender.

Meanwhile melt 1 oz. of beef dripping in another pan. adding and carefully browning 2 oz. of flour. Colour and flavour will largely depend upon this. Strain and stir in gradually the stock from the beef, then boil, skim, and season this gravy.

Beef à la mode. This is a useful casserole dish. Take 1 lb. of steak, and place in a pan to brown with a little butter, flour, and some small onions. Add a glass of claret to a breakfastcupful of stock. Pour over the meat and add carrot, a little mixed herbs, pepper, salt, and the juice of half a lemon. Simmer slowly for two or three hours, adding boiling water if necessary. Serve the meat in the casserole with the onions and carrots and a little chopped parsley.

Cold Beef. Scraps of cold meat may be utilised to make beef cake. It can be ornamented by pressing into the thickly greased top and sides of the mould thinly cut rings of boiled macaroni or cooked peas, rings of cooked carrot, etc.

Take a plain round mould and thickly grease it inside. Melt 1 oz, of butter or dripping in a saucepan, add 2 teaspoonfuls of chopped onion and fry a light brown. Stir in ½ lb. finely minced cooked beef, 2 oz. fresh white crumbs, and 2 teaspoonfuls of chopped parsley. Mix these with one whole egg and one extra yolk, well beaten, and ½ gill of stock. Season and mix carefully.

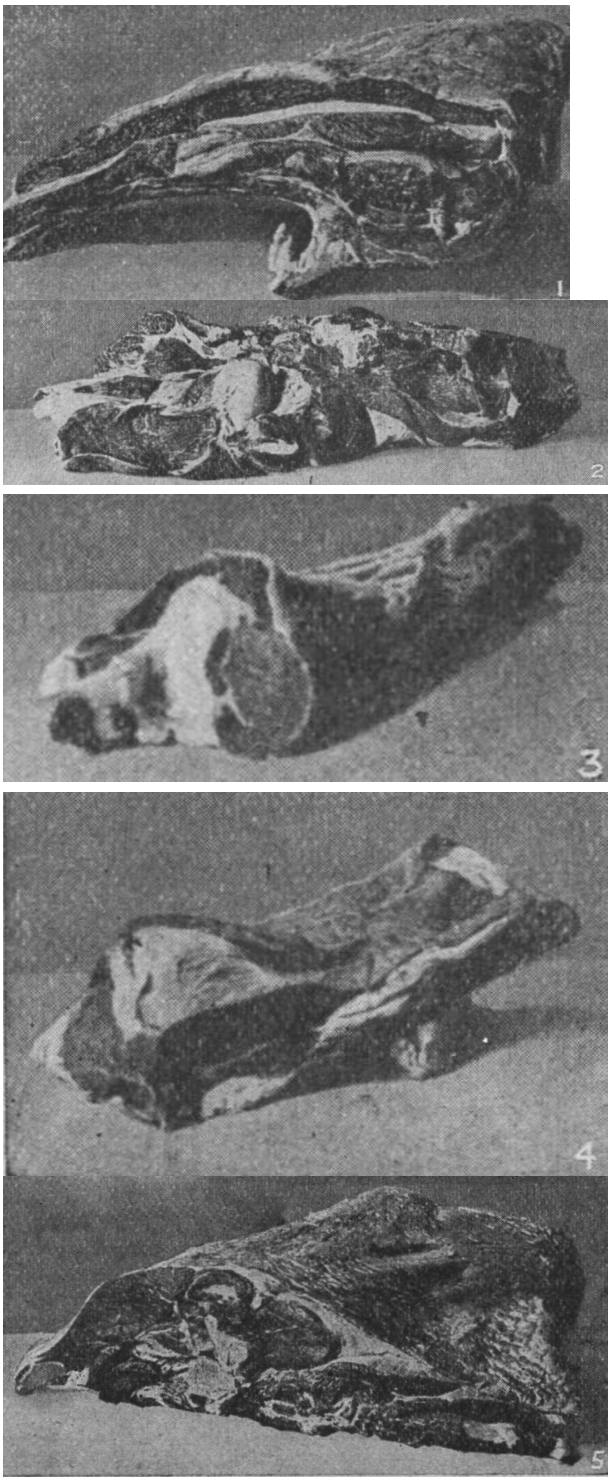
Press the mixture, a little at a time if the mould is decorated, into the greased mould. Twist a piece of greased paper over the top and steam the cake for ½ an hour, or till firm in the centre. Remove the paper, slip the shape on to a hot dish, and strain over and round it a well-flavoured hot brown gravy.

Beef Polantine. This may be served either for breakfast or as a supper dish. Cut ½ lb. of cold roast beef into fine shreds. Have ready 1 gill of good brown gravy heated in a stewpan, add the meat to it, and allow to heat gently. Peel and thinly slice one Spanish onion and divide these slices into rings.

Dip each of these in slightly beaten white of egg or milk, then draw them through a little flour and fry them in smoking hot fat until they are a golden brown tint. Keep these hot, and in the same fat fry three small firm tomatoes cut round in halves. Put the meat and well-seasoned and thickened gravy in the centre of a hot dish, arrange the tomatoes round and heap the fried onions on the top of the meat. This is sufficient for 3 persons.

Pickled Beef. To dry-pickle remove any bones or unsuitable bits from about 5 or 6 lb of thin flank or topside. Rub well over with common salt and leave for 24 hours. Pound together in a mortar 1 lb of common salt, ¼ lb. of brown sugar, ½ oz. of saltpetre, and ½ teaspoonful of black pepper to a fine powder. Rub this mixture thoroughly into the beef, keeping it in an earthenware pan. Turn and rub every day, or at least 3

times a week. Continue this process for 8 days, or until sufficiently salted.



Beef. Above. Joints cut from the fore-quarter, as shown marked off in page 142. 1. Fore-rib. 2. Clod and sticking. 3. Shin. 4. Brisket. 5. Middle piece.

BEEF GOULASH. A Hungarian stew. Cut 1½ lb. of boneless beef into 1 in. cubes, also 3 oz. of streaky bacon. Put these into a stewpan or casserole with 2 oz. of chopped onion, and one small, fresh red chilli, or 2 dried cayenne pods. Add ½ pint of good stock, cover the pan, and simmer contents for one hour, or until the meat is tender.

Mix 2 teaspoonfuls of fine oatmeal with 1 gill of cream, and stir into the stew until it boils. Allow it to cook gently for another 10 min, then season carefully and serve in the casserole or poured out on a hot dish. Small pickled gherkins and wholemeal bread should accompany this dish, which will be sufficient for five to six persons.

BEEF JELLY. Prepared by cutting 4 lb. of good gravy beef into small pieces, laying them in a jar with a pint of cold water and a little salt. Cover tightly, stand in a pan three parts full of boiling water, and stew gently for eight hours. Then strain through a clean hair sieve, and remove every particle of fat the following day. A sheet or two of best leaf gelatine or a little isinglass can be used to stiffen the jelly.

BEEF NOISETTES. Select a good fillet of beef weighing 1½ lb. Trim off rough pieces and divide fillet into round slices not less than ½ in. thick. Melt 1½ oz. of beef dripping or butter in a frying-pan, lay in the noisettes, and fry them quickly for 8 to 10 min., taking care they are under rather than over-cooked. Arrange neatly in two rows on a bed of hot mashed potato or spinach, pressing the round pieces of beef down to hold in position. The next process is to strain round them some hot brown gravy and lay on them a small pat of maître d'hôtel butter.

To prepare this, work into 1 oz. of butter, 1 teaspoonful of finely-chopped parsley, 1 teaspoonful of lemon-juice, salt and cayenne to taste. When mixed, shape into a little flat pat, and allow it to become cold; just before serving place a small piece of it on each noisette.

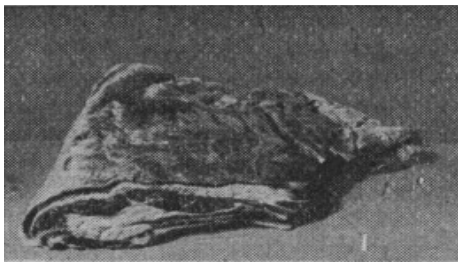
BEEF STEAK PUDDING. Take 2 lb. of steak, wash quickly, dry and cut into pieces about an inch square. Mix together 3 teaspoonfuls flour and a good seasoning of salt and pepper; dip each piece of steak in this mixture.

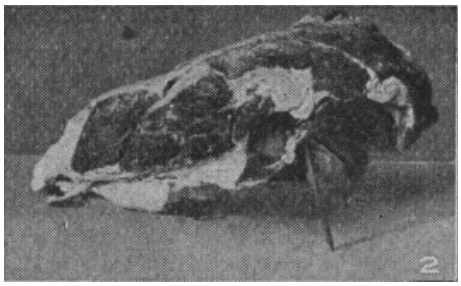
From ¾ lb. of suet pastry cut off about a third and put it on one side; this is for the lid. Grease a pudding-basin, line it with the pastry, then pack in the pieces or rolls of steak. When the basin is full, pour in enough water or stock to come half-way up. Wet edges of pastry, put on lid, and press the edges together. Scald a pudding-cloth and tie securely over the pudding, taking care to make a pleat in the middle of the cloth to allow room for the crust to swell.

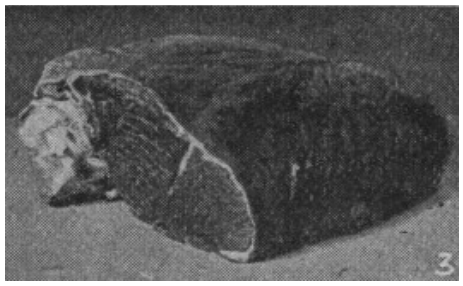
Put the basin in a pan of fast-boiling water and boil from 2 to 3 hours. Serve in the basin with a clean napkin pinned neatly round it. *See* Steak.

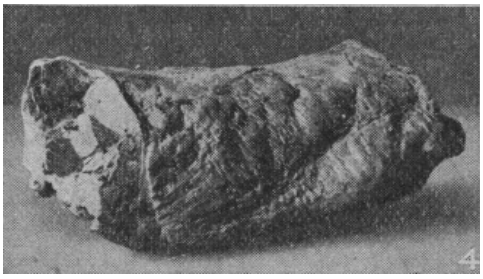
BEEF TEA. When properly prepared beef tea may provide some of the nutritive materials of beef, but the common idea of its excellent food value is unfounded. It is always of less value than milk as food. The stimulating effect on the digestion and the bowels of the meat extractives which it contains is often

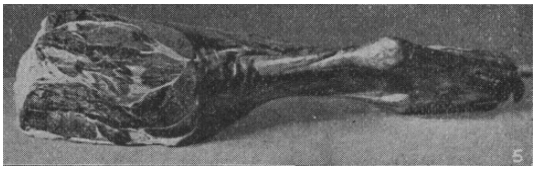
valuable. Beef tea must not be allowed to boil, or even become so hot that the albumen it contains coagulates, as this renders it less easy to assimilate.

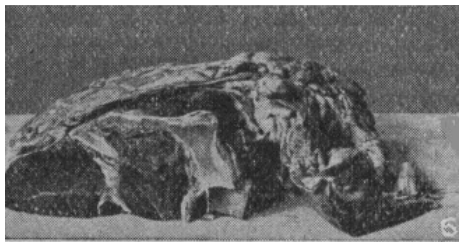


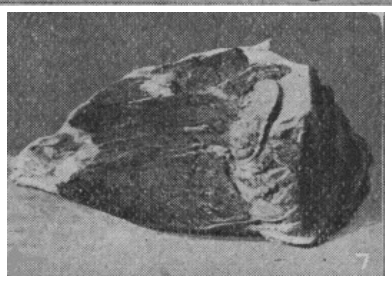


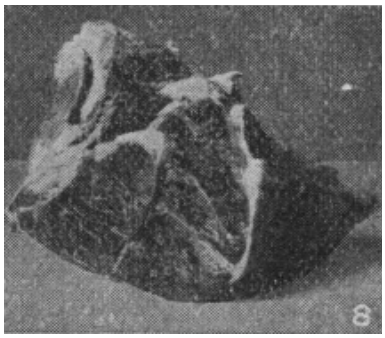












Beef. Above. Joints cut from the hind-quarter, as shown in page 155. 1. Flank. 2. Rump. 3. Silverside. 4. Loin. 5. Leg. 6. Topside. 7. Top-rump. 8. Aitchbone.

Wash 1 lb. of lean beef and dry, cut in slices, and scrape these with a sharp knife. As each piece is scraped, lay it at once in a pint of cold water with ¼ teaspoonful of salt and let it stand for half an hour. Then put the meat and water in an earthenware jar, tying a piece of thick paper over the top. Place the jar in a pan of boiling water on the fire and let the water simmer gently for 3½ hours, stirring occasionally. When cooked, strain out the meat, but do not use too fine a strainer, unless it is imperative that not a particle of solid matter is given. Season carefully with salt. If more convenient, the jar containing the beef tea can be put in a slow oven instead of in a pan of water. Serve with thin dry toast, unless the patient is restricted to a liquid diet.

Uncooked beef tea may be ordered in cases of extreme exhaustion. Usually only one or two teaspoonfuls are given at a time, as it is very strong. It should be prepared only in small quantities, as it will not keep.

Wash and wipe 3 oz. of fresh topside of beef, trimming off fat. Scrape the meat finely, and as it is scraped lay in a shallow dish with three large tablespoonfuls of cold water and a salt-spoonful of salt. Cover over and let it stand until the meat is almost white and the water deep red. Keep pressing the meat well. It will take an hour or more to soak sufficiently. When ready, pour through a piece of fine muslin, squeezing out all the juice.

For beef essence cut 2 lb. lean meat into small pieces, sprinkle with one teaspoonful salt, put into a covered dish with one tablespoonful water, and bake in a moderately hot oven for five or six hours. Serve a teaspoonful of the juice at a time, hot or cold.

BEEF TEA CUSTARD. A useful invalid dish. To make, beat one whole egg and one extra yolk lightly, but well together, without frothing. Heat ¼ pint of beef tea, and pour gradually on to the egg and season. Strain the custard into well-buttered little moulds, twist a piece of buttered paper over the top of each, and steam slowly until firm. If cooked too fast they will be watery and full of holes. When sufficiently cooked, let them stand for a minute or two and then turn them out carefully.

BEEFWOOD. **This wood, which is used by cabinet-makers, comes mainly from the various species of the Australian tree Casuarina. It is also obtained from the bully tree grown in Guiana. *See* Wood.**

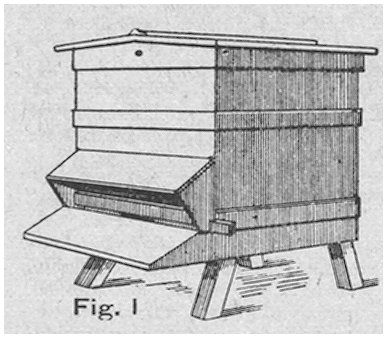
BEEHIVE: CONSTRUCTION OF A MODERN TYPE

Comprehensive Instructions for the Craftsman Beekeeper

For the Principles and Internal Arrangement of a W.B.C. Hive see the article Bee.

Modern beehives are of two main types, the Langstroth and the W.B.C. The former is an American invention dating from 1852, and an improved form is extensively used in Great Britain. The W.B.C. is a hive planned in 1890 by W. Broughton Carr, solely to meet the needs of British bee-keepers. Its internal arrangement is shown in the illustration under Bees and Bee-keeping on p. 139, and we give below all necessary instructions for making a hive of this type.

The hive is shown in perspective in Fig. 1. The outer case, including the roof, consists of three parts, and it is advisable to commence by first making the portion shown at Fig. 2.



Beehive. Fig. 1. W.B.C. hive which can be made by the amateur woodworker

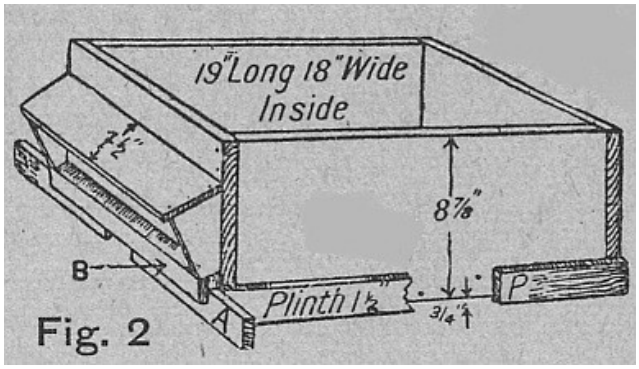


Fig. 2. Lower portion.

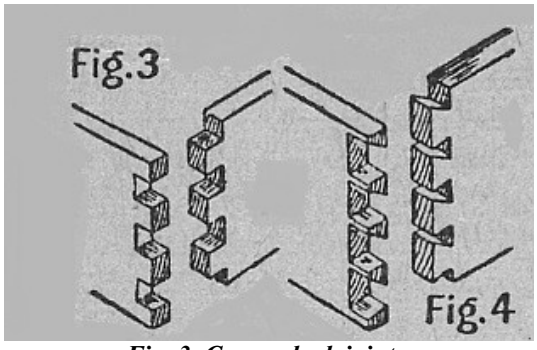


Fig. 3. Corner-lock joint.
Fig. 4. Through-dovetailed joint.

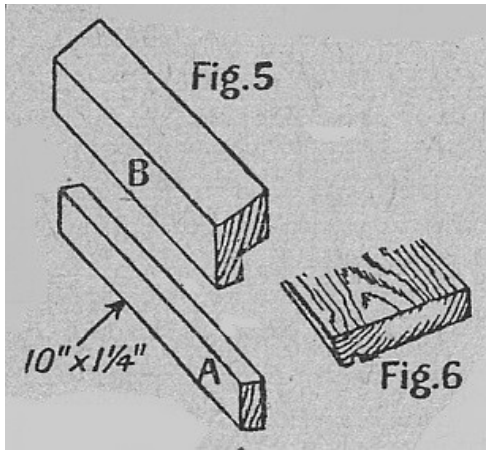


Fig. 5. Details of slides. Fig. 6. Weather groove in porch.

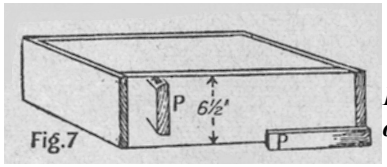


Fig. 7. Upper portion of lift.

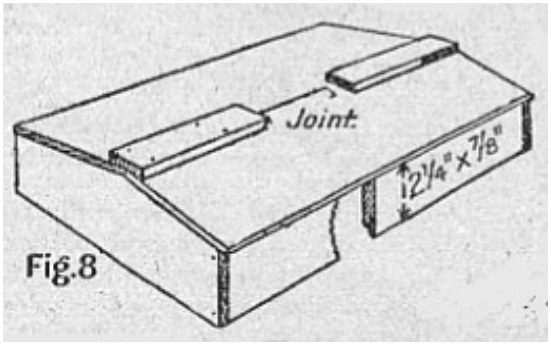


Fig. 8. Roof of case.

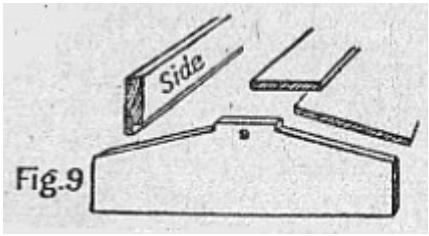


Fig. 9. Alternative method of making a roof.

The construction may be by nailing the case together; if this is done, fine oval brads should be used, and the work should be skew-nailed so as to prevent the joints opening when exposed to the weather. Or, the construction may be by the combing or corner-lock joint (Fig. 3), and this would, of course, be glued and nailed at the joints. Thirdly, the worker could adopt the through-dovetailing method illustrated in Fig. 4.

The front and back boards of Fig. 2 are 19¼ in. long, 8⅞ in. wide, and ½ in. thick: the sides, 19 in by 8⅞ in. of ⅝ in. material. The inside measurement, when fitted together, is 19 in. from front to rear and 18 in. across the front. A plinth 1½ in. wide drops ¾ in. below the edge of the case so as to fit around the floor board and carry off the wet. The two slides, A (Fig. 2), which enlarge or reduce the entrance, are 10 in. by 1¼

in. by ½ in.; these pieces pass through a rebated guide piece (B, Fig. 5), fitted below the porch. A is one of the slides.

The porch is 4½ in. wide, and a weather groove is worked along the edge (Fig. 6) to carry off the drip. This porch is supported at each end by two ½ in. brackets. The second portion of the outer case is a "lift" 6½ in. deep, the wood being the same thickness as the lower portion (Fig. 2). It is advisable to make this in duplicate. A sketch of this lift is given at Fig. 7, and the inset, lettered P, shows an enlarged end sketch of the plinth. The lift may be removed to reduce the height of the hive for winter, and a second lift may be added in the summer when necessary.

The roof is very simply formed with a view to lightness, and is thoroughly rainproof. Fig. 8 will make the main points in the construction quite plain. The front and back pieces are ½ in. thick, 20 ⅜ in. long, 2 ¼ in. deep at the ends, rising to 3¼ in. in the centre or ridge; the sides are of ⅞ in. wood 20⅛ in. long and 2¼ in. deep. Along the lower edge of the side pieces a rebate is cut ⅜ in. by ½ in. deep. This allows the roof to slip over the upper portion of the outer case, and so dispenses with a plinth, whilst effectually keeping out the wet. The top of the roof is of ½ in. wood, each piece being 24 in. by 12 in. Where the parts meet at the centre the ridge piece (of 3 in. by ⅞ in. material) is cut on the underside to cover the joint as shown, so that no water can possibly get in. This roof portion should easily fit over the other; let there be no tightness anywhere so long as the bees cannot enter from the outside.

Some amateurs may prefer to use the type of roof shown at Fig. 9. By making the front and rear of the roof of the shape here shown, the necessity of working out a V-shaped recess under the ridge piece is removed. Suitable ventilation holes should be bored in the front and rear, and a small piece of fine wire gauze should be fitted behind the holes to keep out intruders.

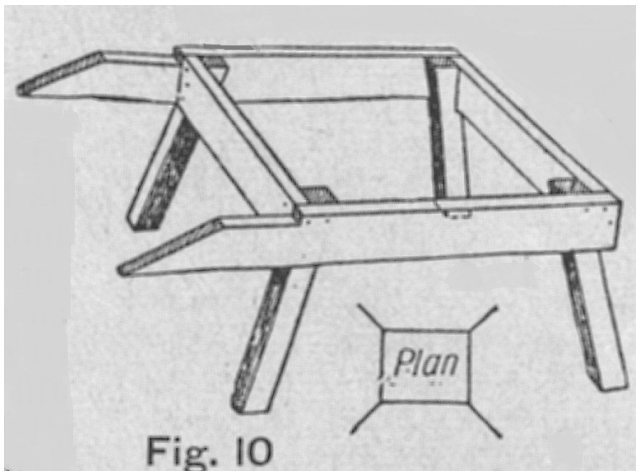
The floor board may be made separate from the legs and supported by a distinct leg frame, or the floor may be built in combination with the splayed legs (Figs. 10 and 11). Beginning with the floor board, the boards forming it are ½ in thick, tongued and grooved where joined, and nailed on to the stout battens 2½ in. deep by 1½ in. thick. Between the points at A it measures 20 in., and the width across is 19⅛ in. The sloping alighting board projects 7 in. beyond the point A. The form of the entrance, as seen in sketch, explains itself. It is 15½ in. long by ½ in. high. Fig. 2, of course, fits on to this floor portion.

The splayed legs (a single line plan diagram of which is shown at Fig 10) are likely to cause some little difficulty to the amateur builder, and the following suggestions will considerably help him. Take a joiner's adjustable bevel and, with a protractor set the blade to 105 degrees, as shown at Fig. 12; then mark at the shoulder lines, as shown at Figs. 13 and 14. Cut the joint as shown, and it will be found that the portion above the shoulder line fits closely into the corner of the frame, whilst the shouldered portion gives rigidity to the whole structure. The height from the floor proper to the top of the flooring boards of the hive may be about 12 in.

Details of Body and Frame

The body box (Fig. 15) is 15⅝ in by 14½ in. inside measurements. It holds ten standard frames and a division board (or dummy), along with two strips of thin wood ⅜ in. wide and 16½ in. long. The front and back boards are ⅝ in. thick. 15⅝ in. long by 8¼ in. wide; side pieces, 17 1/16 in long, 9 in. wide and ⅜ in. thick. The strip of wood, D (16⅜ in. by 1⅜ in. by ¼ in.), nails on the outside to enclose the frame ends as shown. Prior to nailing on this strip, a piece of wood S (⅝ in. by ⅝ in. full) is secured in position level with the top edge of the front and back boards, along which are nailed the tin angle-pieces forming the metal runners, whereon the frames (fitted with W.B.C. ends) work. Fig. 16 shows one end of a standard frame: the portion above A lies on the recess formed in the body box.

The shallow frame box (Fig. 18) is an exact counterpart of the body box with two exceptions: first, the depth is reduced to 3 in.; second, the front and back boards are only 15⅛ in. long. The capacity of this box is ten shallow frames 5½ in. deep with ordinary ends, and two thin slips of wood, or eight similar frames fitted with W.B.C. ends.



Beehive. Fig. 10. Leg frame with plan diagram.

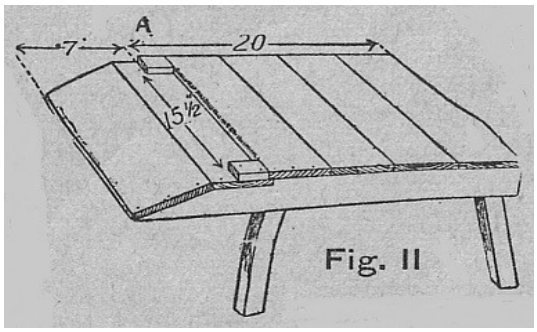


Fig. 11. Flooring and alighting board nailed to frame.

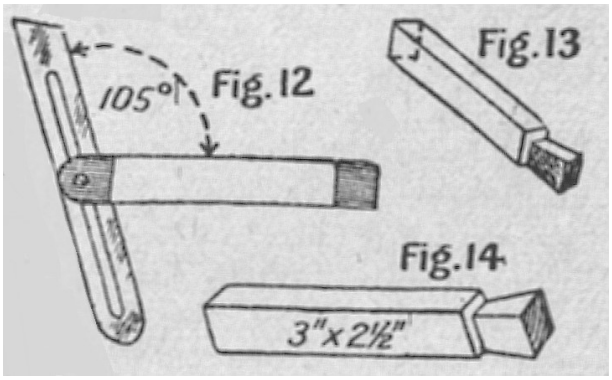


Fig. 12. Joiner's adjustable bevel, set to 105°, for marking off splayed legs. Figs. 13 and 14. Two views of legs showing shoulder joints.

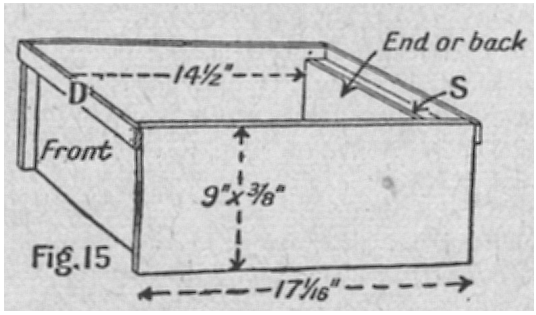
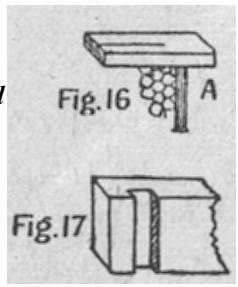


Fig. 15. Body box.

Fig. 16. Corner of standard frame.

Fig. 17. Housing joint for frame.



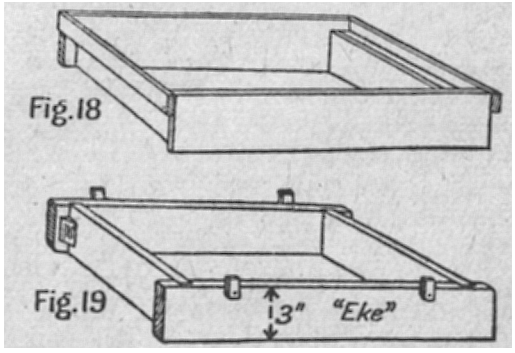


Fig. 18. Shallow frame box. Fig. 19. The eke placed beneath the shallow frame box.

The eke (Fig. 19) may be described as a slice 3 in. deep from the lower side of the body box (Fig. 15) and, beyond stating that the four slips of wood shown on the upper edge are for keeping it in position when fixed, the sketch explains itself. Fig. 17 is a sketch of the housing joint for constructing the frame, and due allowance must be made in the length of the front and rear pieces to fit this housing. The eke may be used for giving space below the combs in winter and, having served this purpose, by reversing and setting it above the frames in early spring it helps in tucking in additional warm wrappings. Finally, when set below the shallow frame box (Fig. 18), it converts the latter into a full-sized brood chamber for standard frames.

Suitable timbers for the making of the hive are yellow pine and red deal, or a combination of the two woods. Where required, screws alone are used, and these are previously dipped in paint, the overlaps and plinths being screwed in their positions from the inside of the cases. Where the wood overlaps, it should have two coats of white lead and oil previously. The outside of the hive is generally painted middle green, the inside being left unpainted. The illustrations are taken from The British Beekeepers' Practical Notebook, Madgwick Houston & Co.

BEE PEST: How to Counteract. Also known by the name foul brood, this disease spreads so rapidly that, unless precautions are taken, a whole neighbourhood may become affected, and the chances of successful beekeeping therein will be seriously imperilled if not utterly destroyed. Two forms of foul brood have long been recognized as existing in Europe, a virulent or strong smelling and an odourless form. A third type, sour brood, has usually been found associated with the strong-smelling type.

When stocks are found to be weak and are working languidly, with little desire to fly and swarming little, foul brood may be suspected. If it is present, an examination of the combs will show cells containing dying or dead larvae, and others with their covers sunken or perforated.

Chilled brood must not be mistaken, as it very frequently is, for foul brood. The dead larvae of chilled brood turn first grey, and afterwards become nearly black, whereas in foul brood the larvae turn at first pale yellow and then brown, except in sour brood, when they turn from grey to yellow.

When the disease is discovered in a weak colony, the burning of bees, combs, frames and quilts together with a thorough disinfection of the hive, is the best course. The spores are then destroyed and the source of the infection removed.

If an affected colony be still strong, the bees may be preserved by making an artificial swarm into a skep or swarm box. The bees should be confined in the skep or box. They should be kept confined in a cool place, such as a cellar, for 48 hours without food, by which time all the honey they may have taken with them will have been consumed, and the diseased bees will have died After the outside has been well painted with oil paint the hive will again be ready for use.

At the end of the period of starvation the bees should be hived into a movable comb hive in the same manner as a swarm. They are then fed for at least a week on syrup, to which as much naphthol beta as can be heaped on a threepenny piece has been added to every pound of white cane sugar used; the naphthol beta being dissolved in methylated spirit, sweet spirit of nitre, or whisky, and added to the syrup while warm

but not hot.

In the case of mild attacks disinfection or fumigation may be resorted to with success, hot soda water or sulphur being used.

These remedial measures are described in Bulletin No. 9, issued by the Ministry of Agriculture. Before attempting them it is advisable to consult an expert bee keeper. *See* Isle of Wight Disease, etc.

BEER. Beer is a fermented infusion of sugary substances with added bitters. At one time the sugary substance consisted of sugar derived from malted barley, and the bitters took the form of hops, but now sugar from other sources is used one of these being by the action of sulphuric acid on starch, and calumba chiretta, quassia, and other substances are used to give the bitter flavour. Notwithstanding these changes the beer may be perfectly wholesome, though many beer drinkers prefer to have the old brew when they can get it.

Beer is a food to a greater extent than other alcoholic liquor, mainly in virtue of the malt or sugar which it contains: but, as a general rule, it is taken as an agreeable form of bitter tonic to stimulate appetite and aid digestion: or it is taken to slake thirst. If taken with a meal it should be in moderate amount, as apart from the nature of a liquid, any large quantity taken during digestion dilutes the gastric juice and delays digestion.

During convalescence from acute illness, and in many cases of consumption, a glass of beer or stout makes a useful and agreeable tonic. Stout is often recommended to nursing mothers by their friends as a means of meeting the additional strain thrown upon them: but as a general rule it is much more satisfactory to leave alcoholic liquor alone, and rather to supplement the diet with extra milk. Stout and porter are beers to which colouring matter has been added. Formerly this was burnt malt, but now it may be caramel, molasses, or liquorice.

People who drink a lot of beer are apt to become stout, and gout and rheumatism may be other legacies of the habit. A beer-heart is one which has broken down under excessive strain, largely imposed upon it by the necessity of pumping through the blood-vessels of the body streams of blood swollen by inordinate beer drinking over a long period. Again the heavy drinker may produce permanent dilatation of his stomach, and chronic gastric catarrh may be a result of intemperate beer drinking.

One has always to be careful about the quality of the beer purveyed. A good beer should be clear, transparent, and reddish-brown in tint, and should not be soured. Beer is sometimes watered, and alum or sugar is added to produce a "head"; the beer goes bad very readily with an increase in its acid content. Such beer may upset the stomach in any quantity. During hot weather many people bring on sickness and diarrhoea by the combination of lager beer and fruit of some sort. There is always some common salt in beer, but in some samples this is materially increased, apparently with the object of creating thirst.

Beer becomes sour on standing in consequence of the growth in it of a minute fungus which converts the alcohol in the beer into acid. This acid is the one which is found in vinegar. If beer becomes dead—that is to say, only slightly sour—it can be restored by adding a teaspoonful of carbonate of soda to each gallon of beer, mixing well, and allowing to settle. The beer will recover a good deal of its sparkle and flavour by this means, but will have lost some of its potency.

If markedly sour the beer cannot be restored, but should be kept to make vinegar. This is done by allowing the beer to stand in contact with the air until souring has progressed to the required stage. The liquid that results may be used as vinegar after having been clarified by filtering through several thicknesses of muslin or through cotton-wool. *See* Ginger Beer; Lager Beer; Spruce Beer.

BEE STING: How to Treat. The constitutional effects of a bee sting may be severe, and are those of shock coldness of the body, faint- ness, etc. The sting should be searched for and removed. The best application is ammonia, but solutions of bicarbonate of soda, common salt, or permanganate of potash may be used. Where the sting is about the eye, mouth, or outer passage of the ear, ammonia would not be used. For the shock the patient is kept warm and stimulants given. If speedy relief is not obtained the doctor should be sent for. *See* Bite; Sting.

BEESWAX. Wax is not gathered by the worker bee, but is organically produced in her body from honey and pollen, by secretion beneath scales. When cleaning hives a box should be kept for the collection of all refuse and burr combs. The scrapings from the floor board during spring cleaning should be saved, for there is generally sufficient wax to make it worth the trouble of extraction. Wax can be obtained from old brood combs and the capping from extracting combs.

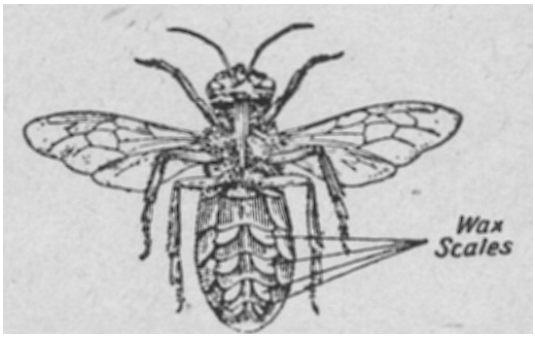
The following methods for extracting the wax are recommended by the Ministry of Agriculture (Bulletin No. 9); (1) The Solar wax extractor; (2) steam; (3) boiling water; or (4) the heat of the oven.

The solar wax extractor is really a miniature garden frame, with a double glazed and hinged light. Inside the frame is fitted with a metal tray which slopes down to a tin trough covered with wire gauze. The extractor is placed in a sunny position and the material to be treated is spread thinly over the bottom of the metal tray. The wax melts and runs into the trough being strained of impurities by means of the wire gauze covering.

The material to be extracted by methods (2) and (3) must be stored until required in an airtight tin for protection against the ravages of the wax moth. In the winter it can be melted over the kitchen fire by means of a Gerster wax extractor, an arrangement similar to a domestic steamer.

To extract wax by means of boiling water the material is tied in a bag made of porous fabric and

stood on laths of wood placed across the bottom of a copper or saucepan, so that the bag does not touch the bottom. The bag should be weighted with a stone, and water poured in until it flows above the bag. The water should then be boiled very gently. The melted wax will percolate through the bag and float on the water, and when cold it can be lifted off in a solid cake.



Beeswax. Worker bee, enlarged to show scales where wax is secreted.

The chief use of beeswax for domestic purpoaes is for floor and furniture polishes.

A floor polish is prepared by shredding yellow wax, 14 oz., and placing it overnight in spirit of turpentine, 32 oz. In the morning place the basin containing the above in a vessel of boiling water and stir until clear. Then remove the basin from the hot water and stir the polish occasionally until it is cold. Many accidents have happened in preparing floor polish through contact of the turpentine vapour with flame. By the above method no danger of fire need arise.

White wax, which is employed for cosmetics, cold cream, and ointments, consists of beeswax bleached by exposure to sunlight. The beeswax is melted and formed into ribbons by pouring it upon rollers partly immersed in water. *See* Cold Cream; Cosmetic; Furniture Cream.

BEET. Of the ordinary garden beet, Beta vulgaris, there are several species, but the only two other than the common kitchen-garden beet which are much cultivated are the spinach beet and the Chilian, the variegated form of which has extremely beautiful foliage and is much grown in flower gardens. There are both green-leaved and red-leaved varieties, and there are white-skinned as well as red-skinned roots.

Most of the beets are natives of Italy and other countries of Southern Europe, and are best if lifted from the ground and stored for winter use, instead of remaining in the soil.

There are two types of culinary root beet—the round and the long. The typical round beet is the turnip-rooted or Egyptian. The skin is dark red and the flesh crimson, but not so deep in colour as some of the long beets. It grows quickly, and consequently gardeners have come to use it for their early supplies storing only the long type. The flavour is excellent. Somewhat larger than the turnip-rooted, and yielding a heavier crop quite as soon, is the globe, in which the roots while quite as wide as the Egyptian, are deeper. The flavour and colour are good.

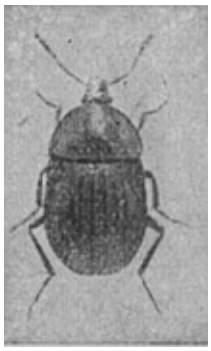
Beet is usually offered for sale at shops in a cooked state. The reason for this is that the skin of the edible beet is very tender, and easily cut, scratched, or pierced. If such an accident happens in its raw state, the beet bleeds or loses its colouring matter, and, at the same time, its appearance and flavour. Hence the value of cooking the root as soon as possible after it has been lifted.

As a native of the seashores, beet appreciates a light, sandy soil, but it is not fastidious, and will succeed in the heaviest clay, provided the soil is made friable. It is raised from seed and thrives in most parts of Great Britain. Early sowing is not advisable for the long or parsnip-shaped beets, because, apart from the risk from frost, there is the danger of the roots becoming large and coarse. May is generally quite early enough, but in light dry soils sowing may be practised about mid April. The turnip-rooted and globe beets may be sown about a month earlier. As a further safeguard against coarseness it is usual to sow beet on ground which was manured for a fibrous-rooted crop the previous year. It may follow peas, beans and leeks.

The seed should be sown in drills drawn 15 in. apart and about 2 in. deep, rather less than more. It is well to sow a patch as a reserve, transplanting to the rows in showery weather as occasion may require. Then only hoeing and thinning will be needed until the crop is ready. Some like to sow the turnip or globe beet in July after early peas or potatoes, and useful roots are thereby secured. To store, fork beet lightly up in October, taking care not to pierce the taps, draw them out by hand, remove the tops, and lay them head to tail and tail to head in sand, covering with straw, bracken or litter to keep out frost. It is not the case that cutting off the tops necessarily leads to loss of sap and colour. As long as the leaves are ripe it does not matter whether they are cut off or twisted, if at least an inch of the stem of each leaf is left on the crown.

Spinach and Seakale Beets. Even the smallest of kitchen gardens is the better for a row or two of spinach beet, which grows to a height-not including the flower-stem--of two feet or more in rich soil. The root is a parsnip-coloured tap. The seakale beet, which is the same plant as the silver beet, is even more vigorous than the spinach beet, from which it is distinguished by having broad, white midribs instead of somewhat narrow green ones. *See* Beetroot.

BEET CARRION BEETLE. The beetle which attacks the beet is flat-backed about half an inch in length, and of a blackish-brown colour, the wing-cases ridged in their length. The larva is a shiny black flat oval whose natural food is carrion, but in the absence of this it attacks the leaves of beet and mangold. The description applies to Silpha opaca, but a near ally, Silpha atrata, of blacker hue, is equally destructive.



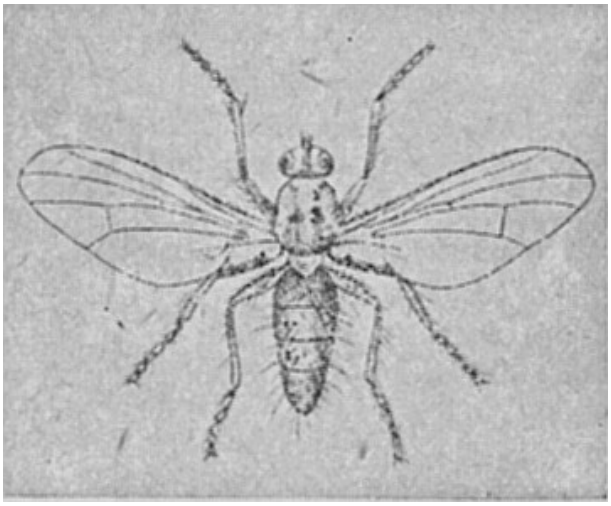


Beet Carrion Beetle, Silpha; right its larva, magnified

The white eggs are laid in the ground in spring, and these soon hatching, the larvae are ready to attack the tender seedlings of the beet. When the leaves show signs of being eaten they should be examined carefully, and the insects picked off and destroyed. Stimulating chemical manures should be applied to give the plants a chance by rapid growth of outliving the injury. Where manures of animal origin are used these should be well worked into the ground in autumn, so as not to attract the beetle in spring.

BEET FLY. The grubs of Pegomyia betae, a small two-winged fly, known as the beet or mangold fly, feed upon the leaves of beet and mangold. The white eggs are laid in batches on the underside of the leaf, and if these are looked for in spring and early summer they may be destroyed by the pressure of finger and thumb. If allowed to hatch, the legless grubs eat the fleshy parts of the leaves, thereby impairing the health of the entire beet plant.

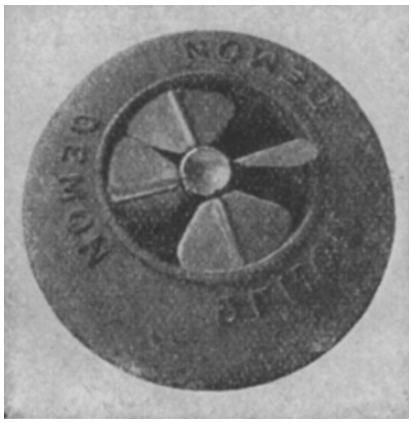
The application of artificial manure, by stimulating growth, may enable the plant to thrive, in spite of this set-back. If, however, some plants have had their leaves skeletonised, it is better to pull these up and destroy both plant and insects.



Beet Fly, a dangerous pest to beets and mangolds; magnified.

BEETLE DESTRUCTION. A beetle trap consists of a well into which beer or diluted treacle is put, and sloping ends which make the well accessible. Attracted by the odour, the insects fall in and die. Phosphor paste spread on thin bread is a deadly lure. Store-room beetles of different kinds will be found on or in the food they attack.

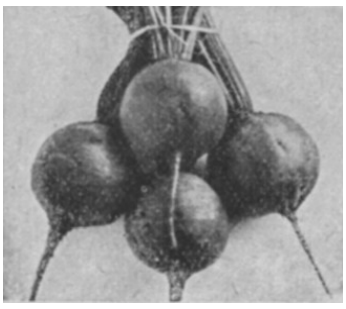
In the case of furniture the problem is often difficult owing to the large size of the article attacked. If small, it may be subjected to a high temperature in the oven; but if large, corrosive sublimate dissolved in methylated spirit should be forced into the minute worm-holes with a fine syringe. If it runs over the surface it will spoil the polish.



Beetle trap with delicately balanced plates that yield with the weight of the insect and drop it into a central well.

Furs or feathers attacked by beetles may be treated by the hot oven process, but great care must be taken that the tenmperature is not so high as to scorch or singe the articles. Naphthaline in the wardrobe will keep the beetles away, but it may not kill those that have made their way therein.

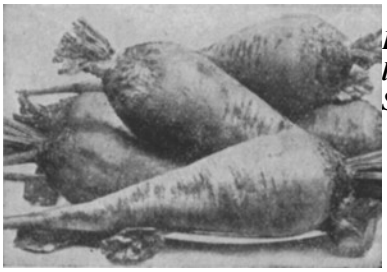
BEETROOT. The root of the beet is rich in sugar. It must be boiled and left to get cold, and is then peeled, sliced, and served with vinegar, or used as an ingredient of salads. It is also served hot as a vegetable. Beetroots are usually already boiled when sold by the greengrocer, but if raw, wash before boiling. Do not touch the skin with a sharp instrument or the root loses its colour. Boil from one to two hours, according to age and size, adding a tablespoonful of salt. Press the skin with the fingers; if it begins to peel off the beet is ready. Drain well in a colander, and when cool remove the skin.



Beetroot. Roots of the globe or turnip beet. (Photo, Sutton & Sons, Ltd).

If to be served hot, peel at once on removing from water, slice and send to table covered with a dressing composed of a teaspoonful each of flour and mustard, and a piece of butter the size of a walnut, a teaspoonful of salad oil, and one tablespoonful of vinegar. This

dressing should be mixed with a little gravy, milk or cream, and boiled till it becomes as thick as melted butter or white sauce. *See* Beet.



Beetroot. Roots of the long beet (Photo, Sutton & Sons, Ltd).

Beetroot Pickle. Prepare a quart of malt vinegar for the pickle by boiling it with ½ oz. each of whole black peppers and allspice and grated horseradish, and then let it cool. Cook 4 large beetroots, peel and slice them, place in bottles, and pour the vinegar over. It is important to take care that the bottles are securely covered.

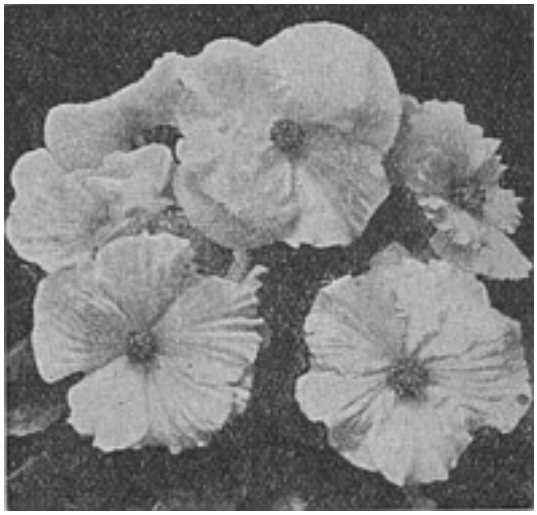
BEGGAR-MY-NEIGHBOUR. A simple card game for two people in which the pack is shuffled, and the dealer deals out the whole pack one at a time to himself and his opponent. The non-dealer has the lead, and he and his opponent turn up cards alternately. When certain cards are turned up by a player his opponent pays him as forfeit a certain number of cards. One card is paid if a jack is turned up, two for a queen, three for a king, and four for an ace. The cards are turned face up alterately by the players until one of the four forfeit cards appears, when payment begins.

If while turning up cards for paying a player reveals a jack, queen, king, or ace, he ceases paying, and his opponent in turn begins to pay the number ot cards required as forfeit. When the whole packs of each player are played, the hands held by each are played out again, and the game is so continued until the cards are in the hands of one player.

BEGONIA: How to Grow. For foliage and bloom the begonia ranks among the best of greenhouse plants. The summer leafing or tuberous begonias are excellent for the cool greenhouse, or for bedding out during the warm months: the winter flowering or fibrous-rooted sorts are valuable under glass when the supply of blossom has become scarce.

The culture of the tuberous sorts is not difficult. An ordinary 15-inch box is big enough, with an inch of drainage material at the bottom and a layer of moss over it. The compost is one part leaf mould, one part loam and one peat with a dash of silver sand. Begonia seed is so tiny that a lot of it may be lost if any lumps are left on the surface. The box or pan should be immersed as far as the edge in a tub of water in order to soak the soil. Any excess of moisture should be allowed to drain away, and the seed carefully sprinkled on the surface. All that is then necessary is a covering of the finest silver sand. Another method adopted by some growers is to lay on a few flakes of clean moist moss instead.

Afterwards the box should be placed in a propagator or in an even temperature of 60°, and be covered with a sheet of glass and a piece of brown paper in December or January. When the tiny seedlings show they should be carefully shaded. In a month they will be ready for transplanting to other boxes. The seedlings should be kept thereafter in a moist atmosphere at as near 60° as possible. If they are to be grown in pots the next shift should be into a 3-inch pot. If intended for bedding they can be kept in boxes.



Begonia. Waxy white flowers of a single variety of begonia in full bloom. (Photo, Sutton & Sons, Ltd.)

Growing Begonias Out-of-Doors

Bedding plants should be carefully hardened. The beginning of May is usually the proper time to put the boxes in a cold frame. Begonias in beds should be well treated. The beds should be dug deeply and well raked over. It is advisable to add spent hotbed manure if available. The plants do best in semi-shade.

Many begonia lovers ignore seed and start with tubers purchased in winter or spring. In starting tubers into growth, lay them on a bed of fibre or in a box of leaf-mould in a moist position in an ordinary greenhouse temperature, where they can get at any rate half-light. All the little fibrous hairs should be carefully rubbed off.

The winter flowering begonias, of which Gloire de Lorraine and its forms are the principal sorts, are invaluable. Gloire de Lorraine is propagated by cuttings. The flowering period extends from October to February, and at its best the plant is a mass of beautiful bloom. After flowering it should be cut back and one or two plants put aside for young stock. New shoots appear after the pruning, and these, which should be removed with a heel of the old wood, form the cuttings. There are several winter varieties.

The rex begonia is grown for its foliage. Its leaves are large and ear-shaped; they are coloured in a great variety of ways, including remarkable combinations of silver greys, crimsons, and bronzes. Propagation is effected by means of the leaves. The best way is to cut half-way through the larger ribs and to pin the leaves

down upon the top of a pot or pan containing sandy loam and peat, just above the places where the incisions are made. In due course tiny plants will appear at the points of these incis-ions. Pron. Be-go'-ne-er.

BELCHING. Besides being common in certain types of indigestion belching occurs in hysteria and neurasthenia. The gas is not from fermenting food but consists of air which has been gulped down. All that may be necessary in the way of treatment is to limit the consumption of sweet or starchy foods. In hysterical cases half-teaspoonful doses of ammoniated tincture of valerian will generally suffice. *See* Flatulence; Indigestion.

BELGIAN HARE. This is a popular breed of rabbits. It is long in body, has large and prominent eyes, and in colour is red with black ticking. It attains a large size, can be easily reared, and is marketable at an early age. *See* Rabbit.



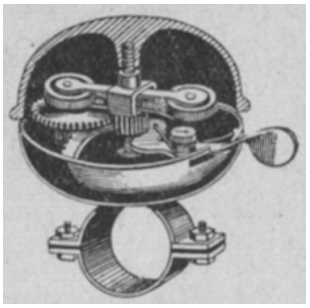
Belgian Hare, a breed of rabbit used largely for table purposes.

BELLS: ELECTRIC & OTHER HOUSEHOLD TYPES

A General Guide to their Installation and Repair

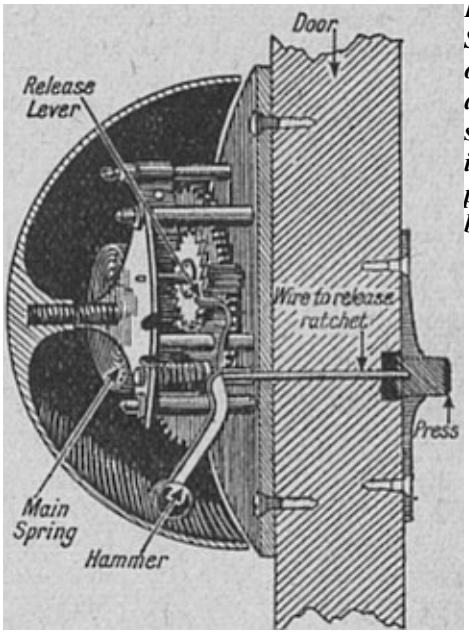
Electric Batteries for Bell work are described under Battery and Dry Battery; Appliances using Electric Bells under Alarm; Burglar Alarm; Fire Alarm, etc.

Bicycle bells are usually actuated by a lever and have a train of wheels and a rotating hammer that sounds the bell many times with once moving the lever, as shown in Fig. 1. Useful types of doorbell are those that have a press knob outside the door and a clockwork device within the bell itself, the hole mounted on the inside of the door, Fig. 2. By revolving the bell a spring is wound up, the action of the door press being to release a catch and allow the spring to unwind. This by actuating a train of wheels and a rotating hammer causes it to ring while press is held.



Bell. Fig. 1. Bicycle bell, showing rotating hammer.

Electric Bells. An electric bell system consists of several distinct elements. These may be classed as follows: (a) The source of the electricity to sound the bells. (b) The bells themselves. (c) The contacts or pushes. (d) Indicators to acquaint the person rung for with the whereabouts of the ringer. (e) The connecting link between all these elements, viz. the wiring system. So far as the source of power is concerned, this is usually obtained from a battery of dry cells or Leclanché batteries located in some convenient place, such as a dry cellar or the top of a cupboard.



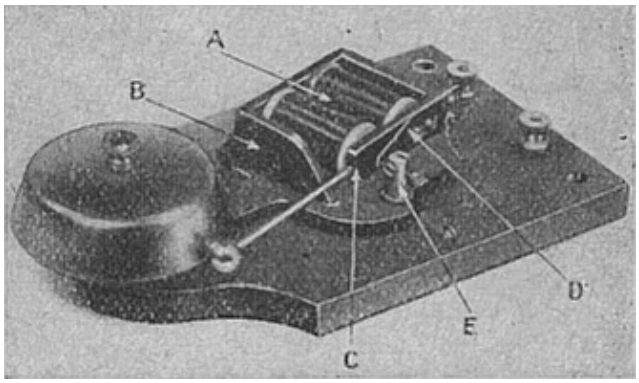
Bell. Fig. 2. Sectional view of doorbell actuated by a spring which is released by pressing a button.

It is a true economy to begin by installing adequate battery power. The average small house of eight rooms will need a battery of three or four Leclanché cells. A large rambling building on three floors with a sub-basement may well need twice this number. Every yard of unnecessary wire in a circuit means so much current wasted, and any bad adjustment or faulty connexions will increase the resistance, and add to the demands upon the battery. The best place for a battery is somewhere near the centre of a system, as all the leads or connexions are then shorter, and current consumption is less.

For indoor use the wire generally used is No. 18 or 20 copper, india-rubber double cotton covered, and paraffined. It is known as No. 18 (or 20) I.R., D.C.C. This wire is usually tinned, to facilitate soldering and guard against oxidation. When measuring up for wire remember to allow for the corners and for waste. When ordering wire it is usual to purchase it in several different colours to assist in identifying the various leads. Twin wire consists of two separate fully insulated wires, enclosed in an outer covering of cotton. In this case one of the wires is usually identified by means of a coloured strand. Flexible wires are used for hanging pushes.

A method of fixing wires above ceilings is shown in Fig 4, insulated staples being used to fix the wires to the rafters. All joints in wires should be thoroughly well

made, as upon the closeness of their metallic contact will depend the excellence or otherwise of the system. Fig. 5 shows two methods. After the wires have been soldered the joint is covered with insulating tape (Fig. 6). This should extend for at least one inch each way on t o the covering itself. Connexions to pushes and bells are generally made by means of a binding screw or terminal nut, as in Fig. 6.



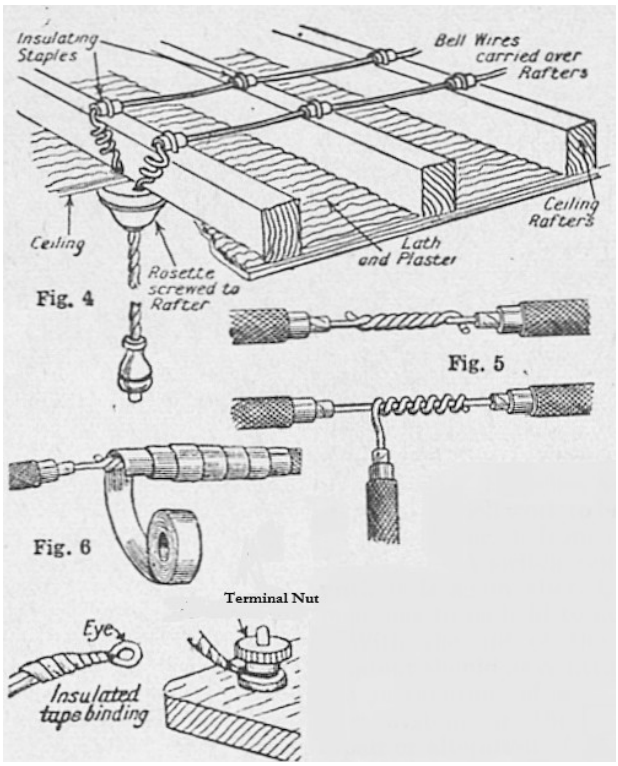
Bell. Fig. 3. Common type of electric bell. The lettering is explained in the text.

The best bells are mounted on an iron frame independent of the wooden base, and provided with a dustproof cover. The type most frequently used is the trembling or vibrating bell illustrated in Fig. 3. It consists of an electro-magnet, A, fixed to an iron frame, B, provided with a soft iron vibrating armature, C, one end of which is fitted with a hammer. The other end is fixed to the frame by a spring, D, an extension of which carries a platinum contact. Fixed to the iron frame but insulated from it is a contact post, E, with an adjustable platinum-pointed contact screw.

When a press button is pushed, current flows from the battery, through the wires to one terminal of the bell, thence through the magnet coils, armature, contact screw and post to the other terminal and back to the battery. The circuit is thus complete, but as the current flows through the magnet coils it energises the core. This attracts the armature, causing it to move and strike a blow on the gong while at the same time the contact spring moves away from the screw and thus breaks the circuit. The current ceases flowing, the spring returns the armature to its starting point, when the contact screw again makes contact and closes the circuit. Owing to this continuous sequence of operations the bell continues to ring while the press is pushed. The contact points should be clean, and the screw adjusted so that the armature is free to vibrate. The armature should not touch the core. Usually this is prevented by a projecting stud of non-magnetic material on the core.

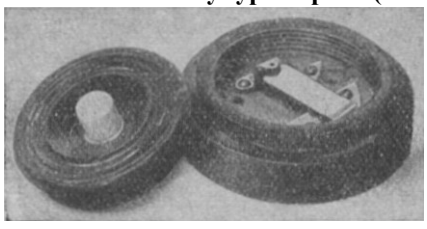
Continuous ringing bells are used in connexion with burglar and fire alarms. Their construction is similar to that of the vibrating bell, but with the addition of a catch on the armature, which engages with a lever to which is fixed a spring. This bell works as follows: First, the current flows as in the trembling bell, but as the armature moves it release lever, which falls against a second contact post. This closes the circuit through another wire to a third terminal, and thence to the battery. The bell therefore continues to ring until the lever is again broken by resetting the lever.

Relays are necessary on long circuits, and many forms of indicator are improved by their addition. The apparatus comprises an electro-magnet with armature and contact screws. Its duty is to close a local circuit when actuated by a relatively weaker current flowing through the coils of its magnet.



Bell. Figs. 4-6. Diagrams illustrating details of work in wiring an electric system.

Bell pushes, pulls, and switches are made in various patterns and materials. Their purpose is the same, viz., to close or open a circuit at will. The contacts of a push consist of two metal plates fixed to the base; one flat, the other shaped like a pig's tail and sufficiently springy to lift itself clear of the flat or lower plate. The press button is held up by this springy contact. An improvement is the morse-key type of push (see Fig. 7).



Bell. Fig. 7. Morse-key type of bell push. (Courtesy of General Electric. Co., Ltd)

The pear push, mostly employed in bedrooms, consists of a pear-shaped handle suspended by twin flexible wires from a rosette on the wall or ceiling.

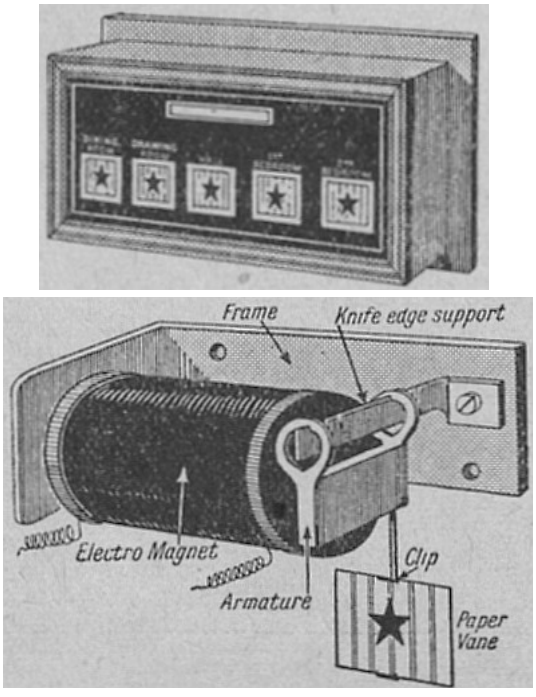
Switches are sometimes used in bell work to break a circuit or transfer it from one place to another.

A switch remains open or closed until it is again altered, whereas a pull or a push has to be held to keep the circuit closed.

With the aid of the foregoing notes the amateur should have little difficulty in tackling the installation of a new system or the repair or alteration of an existing one. The only real trouble is in knowing where and how to place the connecting wires or runs. For this purpose reference should be made to the different wiring diagrams, Fig. 8. In dealing with an existing system, either for purposes of addition, or to trace a fault, it will be necessary to find out the runs of the different circuits.

An ordinary vibrating bell may be employed to test the circuits. Any single circuit can be tested by localising it—attaching one end by a temporary wire to a battery and the other end to one terminal of the bell. A separate temporary wire connects the other battery terminal to the bell. Hence, the circuit being complete and closed, the bell should ring; if it does not, the fault will be somewhere in the circuit under test.

When dealing with a failure of the systems as a whole, suspect the battery or a broken wire. If one or more bells ring feebly and some not at all, then the battery is almost certainly run down. When only one bell fails, and the others are up to standard performance, look for trouble on the affected circuit. It will probably be found in the push, the adjustment of the contact screws of the bell or indicator, or a broken wire. The latter is, however, comparatively rare.

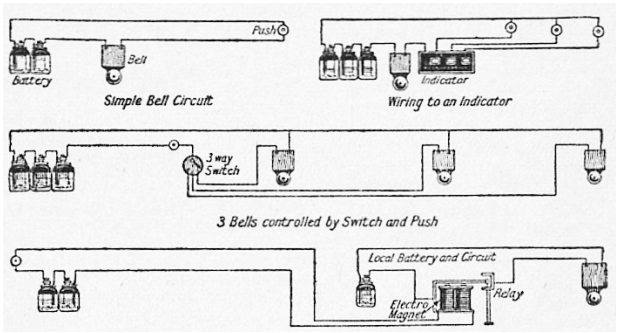


Bell indicator with pendulum disk operated by an electro-magnet.

Bell Indicators. In an electric bell system the indicator tells from which room a call has been received and so dispenses with separate bells. Indicator movements resolve themselves into two main classes—those that drop a shutter or move a disk and have to be reset every time the bell rings and those that swing like a pendulum and do not require resetting.

A form of the pendulum variety is illustrated above. It consists of an electro-magnet fixed at one end to a metal frame. An arm on the frame lightly supports a pendulum armature from which is suspended a paper vane or disk. When the current flows through the magnet, the armature is attracted and set swinging and will continue to swing for some considerable time.

These indicators are generally mounted in a polished hardwood case with a glazed front, through which the paper vanes can be seen. This type of indicator seldom gives trouble; all that is needed to keep them in perfect order is to see that they are clean and that the wires and connections are sound.

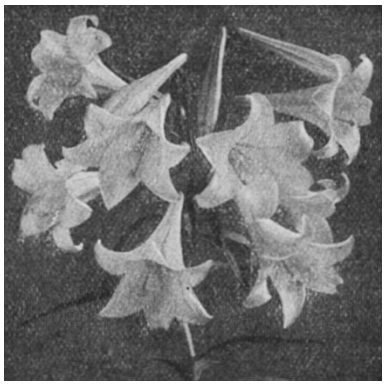


Wiring to relay local Circuit.

Bell. Fig. 8. Diagrams of simple electric bell systems which are easily installed.

BELLADONNA. Both the leaves and the root of the deadly nightshade, or belladonna, are employed in medicine, the active principle being atropine. The liniment of belladonna often gives good results in neuralgia.

The symptoms of poisoning by belladonna, or deadly nightshade, are dryness of the mouth, impairment of swallowing and speech, thirst, dilatation of the pupils, dry skin, and frequently a scarlet rash, delirium, and unconsciousness. The best antidote is warm strong tea administered immediately. *See* Atropine Poisoning.



Belladonna Lily. Cluster of the large delicately coloured flowers of the Amaryllis.

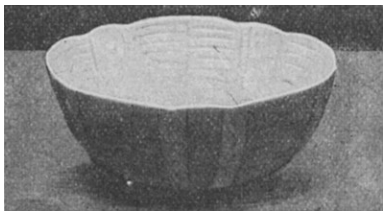
BELLADONNA LILY. The popular name of belladonna lily is given to the Amarylis, of which A. Belladonna bears rich deep pink or salmon-coloured flowers. It needs deep rich soil and the shelter of a southern aspect to thrive in counties north of the Thames. The bulbs should be planted in June and the

flowers appear, before the foliage, in August and September. The greenhouse or half-hardy species of the belladonna lily are known as Hippeastrum (q.v).

BELL CRANK. A mechanical device for transmitting motion from one direction to another at an angle to it, usually a right angle. By suitable proportion of the arms a different stroke or pull is obtainable. The device is in extensive use on machinery, but derives its name from its application to domestic bells of the old spring-operated type.

BELLEEK WARE. While similar lustreware is manufactured in Glasgow, Staffordshire and the United States, the true Irish porcelain from the factory at Belleek on Lough Erne is easily distinguished by its characteristic mark, stencilled or stamped in colour, of the name with a device of a round tower, greyhound, harp and shamrock leaves.

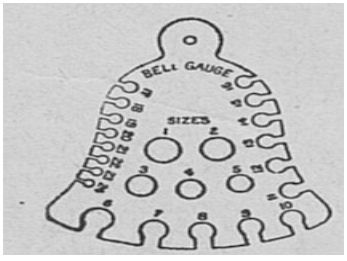
For a quarter of a century after 1857 the factory turned out its best thin, eggshell type of parian ware, sometimes with an ivory glaze and a mother-of-pearl lustre. *See* China.



Belleek Ware. Basin of genuine tinted porcelain made in the North of Ireland.

Bell flower. *See* Campanula.

BELL GAUGE. Made of nickel-plated steel, and shaped as shown in the illustration, this is used for measuring knitting needles and crochet hooks. The latter should pass through easily and never be forced. For sizes 1 to 5 use the holes, but for siaes 6 to 24 inclusive use the slits leading into the holes, the holes in these particular sizes being intended to release the pins when gauged. *See* Crochet: Knitting.



Bell Gauge for measuring knitting needles and crochet hooks.

BELL-GLASS. A glass vessel, bell-shaped, with a knob at the top, this is made in various sizes, the mouth fitting into an earthenware saucer. Seeds sown in a pot and stood in the saucer under the glass will rapidly germinate and grow, owing to the close, moist atmosphere. Bell-glasses are also invaluable for forcing cuttings quickly to take root, or for growing seeds that need the protection of glass in their earlier stages. In the largest sizes—those which are used for the French system of intensive horticulture—the native word cloches is now so usually applied that it has become anglicised.

BELL METAL. The metallic alloy used in bell-casting is generally composed of 78 p.c. copper and 22 p.c. tin. The material is expensive, but by its use alone can a good tone be obtained. Bell metal is occasionally used for very high-class cooking utensils, such as stewpans and kettles.

BELLOWS. In their simplest form bellows are elementary types of air compressor, adapted for blowing fires. The same principle is frequently applied to the bellows used for blowing the organ in a church or hall, to vocalise certain small toys, and to actuate part of the mechanism of a player piano. A concertina is another type of musical instrument embodying bellows to act as artificial lungs. Many cameras have bellows to exclude extraneous light rays from the lens and photographic plate. *(See* Camera).

Bellows are designed for single action, double action, or treble action, according to the number of stages through which the air is compressed. An example of the first is the domestic fireside bellows. Double-action bellows are largely used for small brazing and blacksmithing obs: a usual form operated by foot power.

BELL'S PALSY. Paralysis of the muscles of the face is known as Bell's palsy and is usually confined to one side of the face. The cause may be exposure to cold, as when a person sits at the open window of a railway carriage, or a blow in the region of the ear. It may also be brought about by diphtheria, meningitis or ear-troubles.

When due to cold, a mustard leaf should be applied behind the ear and the patient protected from further cold. If there is much pain 10 grains of aspirin may be given. Medical advice must be taken.



Benares Ware. Simple engraved lota, a vessel employed in Hindu ritual. (Victoria & Albert Museum) (Indian Section.)

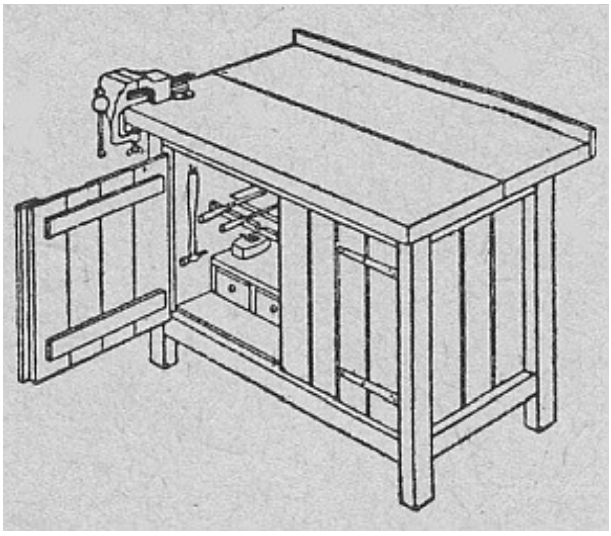
BENARES WARE. The decorated brassware produced by Hindu artisans at Benares includes trays and salvers plates, tumblers, hookahs, gongs, and various forms of waterbottles and ewers. Especially graceful are the melon-shaped lotas, used for religious purposes. Cheap Benares ware has been produced for export, with shallow designs based on foreign requirements, such as jardinières and ash-trays. The inside of a piece of lemon rind rubbed hard on the surface and washed off with hot water will clean the article ready for polishing with a soft, dry cloth. Ordinary metal polish should never be applied. Good pieces, which should not be lacquered, may be cleaned with a mixture of sweet-oil and rottenstone, free from grit, rubbed in with a flannel, and finished off with soft

leather. *See* Brass.

THE BENCH: FOR CARPENTER AND MECHANIC

Two Examples of a Necessary Feature of the Workshop
See also Amateur Carpentry and the articles on Chisel, Hammer, Saw and other tools

The combined bench and cupboard shown in Fig. 1 is within the capabilities of any amateur. Convenient sizes are 3 ft. long, 1 ft. 9 in. wide on top. and 2 ft 9 in. high. The legs are 2 ft. 7 in. long, made from 2 in. x 2 in. deal, the cross-pieces of similar scantling mortised and tenoned into the legs. The back and ends are enclosed by ⅜ in match-lining, nailed in place, while the top is made from two pieces of 11 in. x 2 in. deal glued and pinned together and screwed in place with 3½ in. screws passing through the framework.



Bench. Fig. 1. Combined bench and cupboard.

The front is enclosed by two simple doors hung on 6 in. cross garnets and provided with a bolt. The floor is of match-lining; and the shelves and racks are cut from 6 in. x ⅝ in deal.

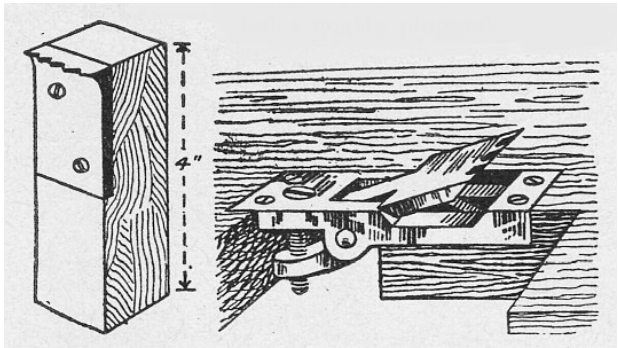
A few small drawers at the bottom accommodate screws, nails and other small parts. A backboard 4 in. wide and ⅝ in thick prevents the tools falling off at the back. A portable bench vice with a clamp fitting is very convenient; it is fixed up in a few moments, and when not wanted is accommodated within the cupboard. The various tools are supported on racks or shelves or hang from hooks, as may be most convenient.

The regulation joiner's bench, as a general rule, is made of beech wood or other hard material. The top fits into special slots, the cross rails being secured by long hardwood wedges. Two vices are fitted, one for ordinary use at the left hand end of the bench, the other, or tail vice, works longways of the bench and acts as a cramp for wide work. Square holes and the pegs provided to fit them enable work of widely varying widths to be held firmly. A tool-well prevents the tools getting in the way of the work, while a drawer holds others not needed at the moment. Convenient sizes for such a bench are: 6 ft. long, 2 ft. wide, 2 ft. 6 in. high, legs 4 in. square, rails 3 in. x 2 in., top 3 in. thick. A portable carpenter's bench of a useful type is shown in the picture of a workshop on page 23. Such a bench may be purchased ready for use, or it is quite easily constructed.

Where a regular workshop is available it is frequently possible to build in a work bench. This is both economical and practical; stiffness and rigidity are assured, and for metal work it is preferable to the portable benches. One important item is to see that the bench stands fair and square on the floor: it must be accurately levelled, which may be done by means of suitable packing beneath the legs.

The construction of a mechanic's bench is illustrated in Fig. 2. A convenient height is 34 in., with a width of 30 in. and a length of 6 ft. The top is composed of oak or other hardwood 2 to 3 in. thick at the front, and 1 in. thick at the back.

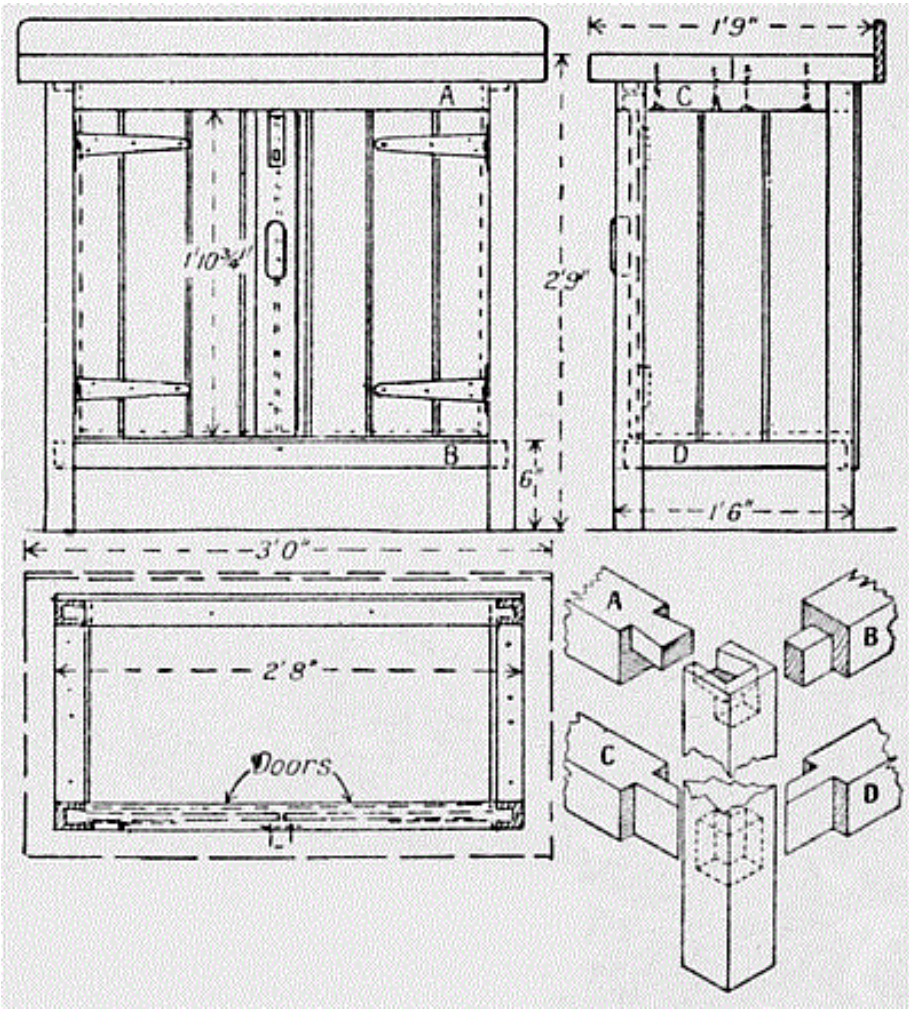
The design of such a bench needs careful attention. The legs must be at least 3 in. square and very well framed up with diagonal cross braces and stout longitudinal members. The thick top may be bolted to the cross members, the bolt heads being sunk below the surface of the bench and the holes neatly plugged.



Bench Stop. Left, wooden stop to insert in mortise. Right, rising metal stop controlled by screw.

BENCH STOP. This is a hardwood or metal stop, fixed or adjustable, against which work is rested on the bench when planing, etc. In its simplest form it may be a wooden strip screwed to the bench top a short distance from one end, close to the front edge of the bench. Another kind of stop, made from a piece of hardwood about 4 in. long by 2 in. square, is mortised through the top of the bench about 2 in. from the edge. The stop fits tightly in the mortise, and is knocked upwards or downwards with a mallet to adjust its height above the bench. A face iron may be made by heating and flattening the end of a piece of 2 in. iron, and cutting serrations in its edge with a saw file. *(See* illustration).

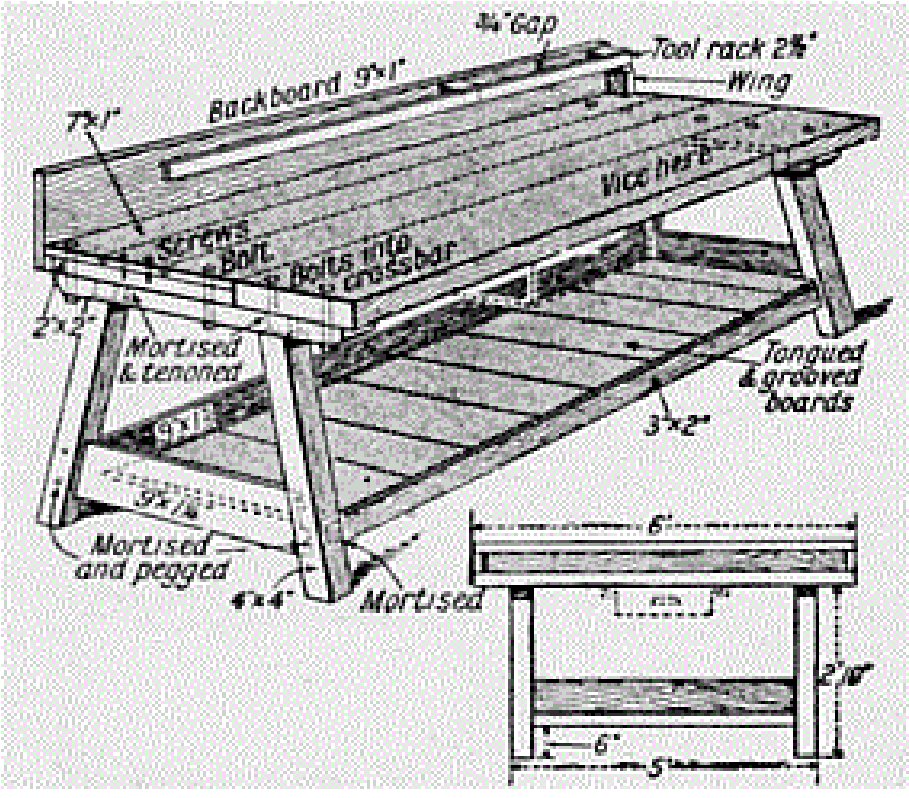
Adjustable metal stops are made in various patterns, and are easily fitted to the bench top. In one type the stop piece is hinged at one end to its plate, and is raised or depressed by turning a large screw-head in the plate. In another type the stop rises and falls in a socket as the adjusting screw is turned.



Bench. Fig. 1. Front elevation and end.

Fig. 1. Plan of framing.

Joints used. A, top rail, dovetail; B, cross rail, tenon; C, bottom rail, mitred tenon.



Bench. Fig. 2. Diagrams explaining the construction of a mechanic's bench.

BENT IRON WORK: SOME OF ITS USES

A Process that Can Be Used to Beautify the Home

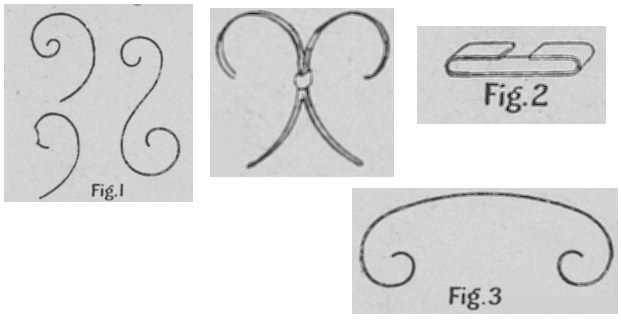
See further the entries on Lacquer; Piercing; Wrought Iron and other related subjects

Bent iron work is used for numerous household articles, including grilles, screens, lamps, stands for flower bowls and vases, wall brackets, photograph and picture frames, and other purposes. It varies in character from work done at a forge on red hot metal to that which is easily done cold by bending with pliers or with the fingers.

Bent iron work is often practised as a hobby by amateurs at home. Only a few tools are required, and the skill consists mainly in producing graceful curves, symmetrical proportions, suitable designs and secure unions of parts. The iron can be bought in coils, or strips of it can be cut with shears from sheet metal. Most of it is about the thickness of ordinary tin plate, and bends nearly as easily as the latter. Widths range from ⅛ in. to ⅜ in. In most articles there must be something in the form of a frame, or substantial element, to which the comparatively weak and slender ornamental work can be attached. The apparent endless variety is made up of a few elementary forms repeated continually. These are shown in Fig. 1. Besides these we get plain circles and ovals.

The strip of metal is cut with shears and then bent with pliers. Round-nose pliers are used for bending small curves, the unbent part being held with flat-nose pliers or with the fingers. Pliers are used to hold the strip securely and to bend a little at a time. They are moved along as required, and the workman judges by his eye when the curve is correct. Heavy, flat pliers are used afterwards to assist in taking out kinks and improving the curve.

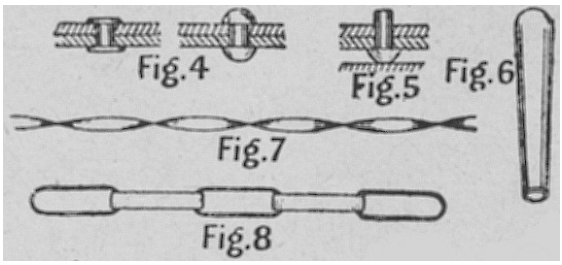
Parts in contact are generally held together by clips (Figs. 2 and 3). These are made from the ordinary strip and pinched tight with pliers. Sometimes joints are riveted and sometimes soldered. Riveting is only practicable when the parts can be laid on an anvil for hammering the rivets. Holes for rivets are generally punched. In thick metal— that is, more than about 1/16 in.—drilling is the only way. In metal too thin to be countersunk the rivets used must be of the types shown in Fig. 4.

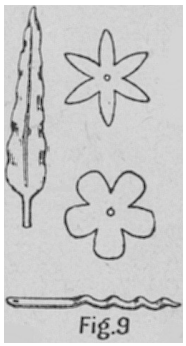


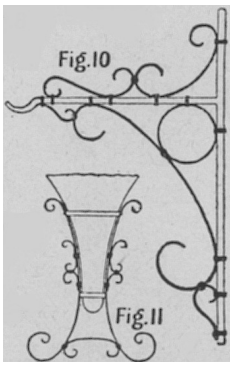
Bent Iron Work. Figs. 1-6. Scrolls and joints used in the work. Figs. 7-13. Characteristic patterns for brackets, grilles, etc.

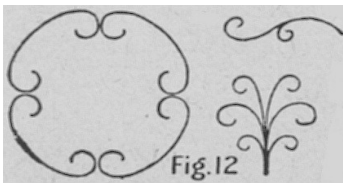
Fig. 5 shows a rivet in place before it has been closed by hammering, the type of rivet shown being the cup-head or snaphead. The tool shown in Fig. 6 is used, in the same way as a punch, for imparting a neat convexity to the tail of the rivet, after the preliminary work has been done with the hammer only. A block with a similar concavity should be placed beneath the head of the rivet to keep it from flattening on the anvil.

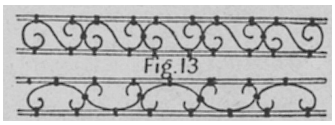
Small bolts are occasionally used instead of rivets. For soldering, the surfaces must be cleaned and flux applied. They can then be coated with solder and pinched together with hot tongs, or bound with wire and heated by a flame, or pinched with pliers while the solder is running. Of all the above methods the clip is the most popular and the quickest.

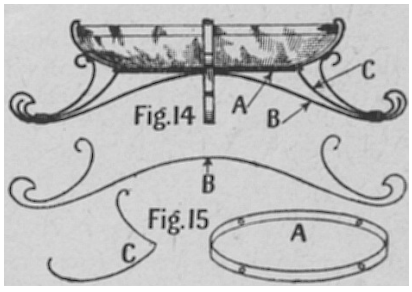










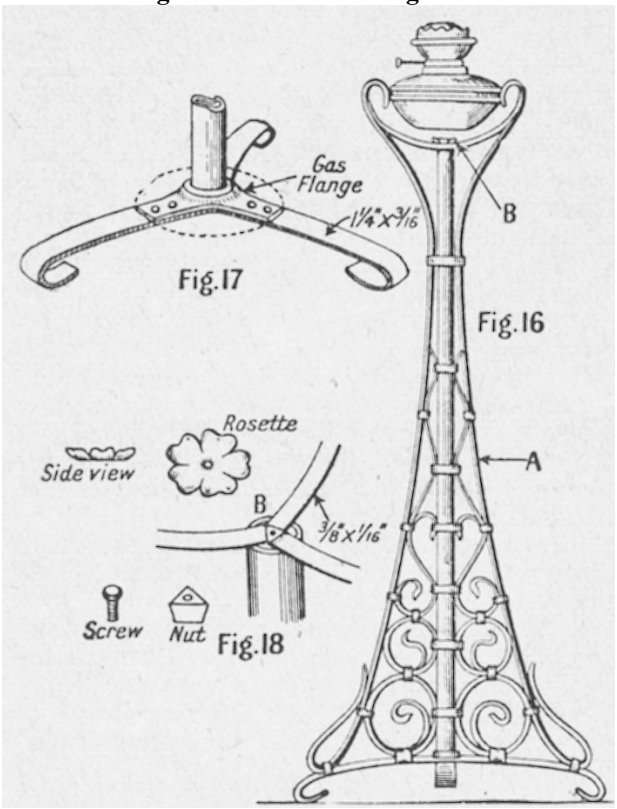


Figs. 14-15. Stand for a copper or china bowl.

Use of Twisted Strips. Fig. 7 shows how strip can be twisted, either for appearance or to make it equally stiff each way. The ends are held with pliers or, preferably, one end is held in a vice and the other twisted with pliers. Fig. 8 shows chain made from strip iron. Fig. 9 shows examples of sheet metal ornaments. These are often of copper and, strictly, they are classed as repoussé rather than bent iron work.

Fig. 10 shows a wall bracket, the frame of which consists of stout iron rod. Fig. 11, made entirely of bent iron, is a stand made to suit a glass or china vase. Fig. 12 shows how the large areas of grilles and screens are filled in by a repetition of some simple pattern. Fig. 13 shows the same method applied to narrow borders.

For the floating flower bowl, shown in Fig. 14, a polished copper or brass bowl can be used, or one of brightly-coloured china. The combination of a flame-colour bowl with the dull black iron is very effective for table ornament. Make the foundation ring, A (of a size to suit the bowl), from stout iron, to which is attached the ornamental ironwork. The stand is made in two units, as shown in Fig. 15, each composed of three parts; these, when made up, are riveted to the foundation ring and form the four legs.



Bent Iron Work. Figs. 16-18. Standard floor lamp and details of its construction.

Making a Standard Lamp. A design for a floor lamp is shown in Fig. 16. First choose the lamp and make the top ring to suit it from ⅜ by 3/32 in. metal. Then cut a piece of gas barrel ¾ in. outside diameter, and at the lower end fit a gas flange, screwing it on to the tube. The flange has to be cut away to form three arms (Fig. 17) and to these the bottom legs of 1¼ by 3/16 in. iron are riveted or brazed. The long and continuous outer members, A, of ⅜ by 3/16 in. iron, and then the pieces B (Figs. 16 and 18) are bent and riveted in position. The inner ends of the latter are turned down into the bore of the upright pipe and secured by driving in a 3/16 in. Whitworth nut filed to fit as in Fig. 18. This part is completed with a rosette and ball bead screw. The remainder of the decorative work is carried out in ordinary ¼ in. strip iron, shaped and clipped in place as shown in Fig. 16. The result is a handsome standard for an oil lamp. If desired, the design could be readily adapted to take an electric lamp, the fittings and shade carrier being purchased complete.

Bent iron is generally given a dull black finish. Dead black paint for iron can be obtained ready for use, or can be made by mixing drop black with turpentine and adding a small amount of gold size. Brass and copper ornaments should show their natural colour, but may be lacquered.

BENZENE. Also known as benzol, this is a colourless liquid distilled from coal tar. It is highly inflammable and requires careful handling. As a solvent of fats and oils, benzine is often used to remove grease stains from clothes and gloves, which it does without affecting the colour of the materal. *See* Stain.

BENZINE. Similar to benzene as a grease solvent, benzine, which is obtained from petroleum, is cheaper and more widely used. Perfumed benzine is made by adding lavender oil 1 dr. to each pint of benzine. In using perfumed benzine the material should be laid on several folds of clean blotting paper, thr stain covered with a few drops of the benzine, dusted with fuller's earth and pressed. *See* Stain.

Benzoin. *See* Friar's Balsam.

Benzol. *See* Benzene.

BEQUEST. The gift by will of anything except land is called a bquest and is the same thing as a legacy. When a specific article, e,g. "my watch," is bequeathed, the legatee is entitled to it subject to payment of debts, regardless of the fact that no one else gets anything. A general bequest is of a sum of money, e.g. "I give to John £100." If there are a number of such legacies, and the assets are not enough to pay them all in full, they should be reduced rateably. A residuary bequest is a legacy of what is left after paying specific and general bequests. *See* Legacy; Will.

BERGAMOT. When lightly rubbed the foliage of some bergamots diffuses an agreeable aroma. It is a hardy herbaceous perennial growing about 2 ft. high, and has square stems, hairy leaves and whorls of crimson flowers in summer. "Cambridge Scarlet" is the best variety. The sweet bergamot, an excellent plant for small herbaceous borders, thrives in any fairly fertile and friable garden soil. Propagation is by seed sown under glass in March, or outdoors a few weeks later; also by division in autumn or spring.

The only other species of note is the wild bergamot, a somewhat taller plant with purplish flowers, also having aromatic leaves.

The essential oil of the same name is obtained from a variety of orange, taking its name from the town of Bergamot. Its rind yields a very fragrant oil used in

high-class confectionery, liqueurs, and largely in perfumery. Bergamot is sold as an essence. Pron. Ber'-ger-mot.

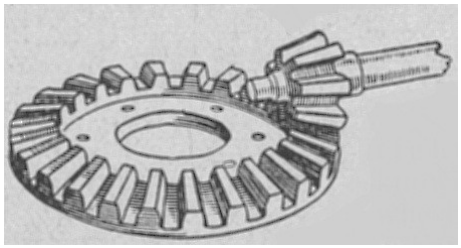


Bergamot. Flowers and leaves of the fragrant garden herb.

BEST MAN. A relative or personal friend who accompanies the bridegroom to the church or wherever the ceremony is to take place. Previously he has seen that the necessary arrangements have been made and received instructions from the bridegroom as to what he wishes him to do. With the bridegroom he stands in position to receive the bride, and remains just behind the pair during the ceremony. At the right moment he hands the ring to the bridegroom and he accompanies the newly married pair to the vestry, where he usually signs the register.

If a reception follows the ceremony, the best man helps to attend to the comfort of the guests. The best man sees to the payment of the officials who have assisted at the marriage service — the clergyman or registrar, the organist and others that are necessary, and distributes gratuities. *See* Marriage; Wedding.

BEVEL GEAR. The use of bevel gears is for transmitting motion from one shaft to another when their centre lines are at an angle to one another. The teeth are cut radially and to an angle or bevel formed on the outer part of the face of the wheel, the angle and shape of the teeth being determined largely by the relative diameters of the pair of wheels. Two equal size bevel gears that are used to transmit motion at right angles are known as mitre wheels.



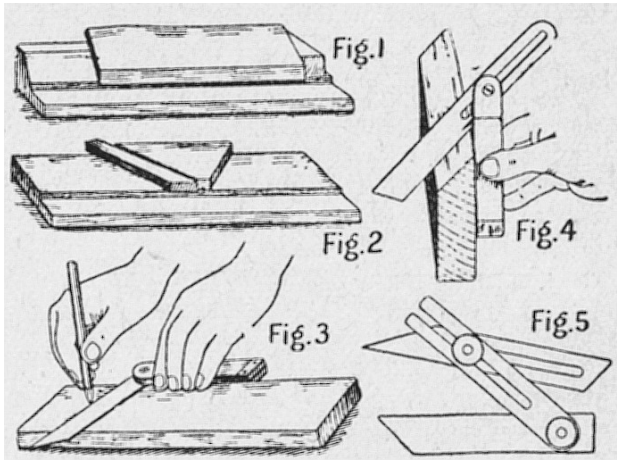
Bevel Gear. Straight toothed bevel wheel and pinion.

Familiar applications are the gears on egg whisks, hand drills, butter churns and some makes of window control gear. *See* Gear.

BEVELLING. It is chiefly in woodwork that bevelling is found; it means the production of surfaces which are neither at right angles nor parallel with each other. A box or tray with splayed or sloping sides and ends, or the body of a barrow, are instances where joints are bevelled to obtain the required shape of the article. In other cases an exterior surface may be bevelled in relation to other surfaces, e.g. the top edge of a plinth.

In furniture, edges are frequently chamfered, which means planing off the angles so that a narrow flat at the angle of 45° is formed. Parts meeting with a joint at 45°, such as the corners of picture-frames are said to be mitred. A sloping joint uniting pieces in the same plane is a scarfed or spliced joint. All come under the heading of bevelling.

As a general rule lines are marked on the work to show the exact extent of the required bevel, and the cutting tools work to these lines. In other cases appliances are used for guiding the tools. In sawing small pieces at an angle of 45° a mitre box or a mitre block may be used to guide the saw. For planing the angles two types of shooting boards are used. These may be for 45° only, or adjustable to any angle. One kind is used for planing long edges (Fig. 1), the other for short ends (Fig. 2). In both the plane is used lying on its side. It is slid backwards and forwards with the right hand, while the work is held in position with the left.



Bevelling. Figs. 1-5. Diagrams illustrating methods of making edges in carpentry.

A woodworker's bevel is used for marking lines (Fig. 3) and testing (Fig. 4). The bevel is adjustable to any angle, and is tightened by a screwdriver or by a wing-nut. Definite angles are obtained from a protractor, or by drawing a full-size view of that portion of the work on paper. Fig. 5 shows a type of bevel used chiefly by metal workers. Besides this there are bevels in combination with protractors.

Beveren Rabbit. This rabbit is largely bred for its pelt; there are two varieties, one slate blue, the other white. *See* Fur; Rabbit.

BEZIQUE: For Beginners. Bezique is a game of cards for two, three, or more players, and is played with two or more packs, one for each player, shuffled together. The packs do not contain the sixes, fives, fours, threes, or twos. The cards, in order of importance, are ace, ten, king, queen, knave, nine, eight, seven. For the sake of simplicity the game for two players will be described.

Two ordinary packs, with the noted cards removed, are thoroughly shuffled together and cut by the two opponents, the player cutting the higher card having the right to deal. The dealer deals out the cards, three to his opponent, three to himself, then two to his opponent, two to himself, and finally three to his opponent and three to himself. The 17th card is turned up for trumps, the remainder of the pack, face downwards, lying between the two players. If the turn-up happens to be a seven the dealer scores 10 points.

The game is 1,000 up, and the points scored are for the following combinations held by the players, and declared by them, i.e. placed face upwards on the table. The table gives the names of the declarations:

	Points
Bezique (queen of spades and knave of diamonds, or queen of clubs and knave of hearts, according to trumps)	40
Double bezique (both queens and both knaves	500
Sequence (ace, ten, king, queen, knave of trumps)	250
Common marriage (king and queen of any suit save trumps)	20
Royal marriage (king and queen of trumps)	40
4 Aces	100
4 Kings	80
4 Queens	60
4 Knaves	40
Seven of trumps (turned up)	10
Playing seven of trumps	10
Exchanging seven of trumps for trump card	10
Winning of last trick	10
Each ace and ten in tricks of scoring player	10

The play is as follows: Each player looks at his hand, and the dealer leads a card which he thinks he is least likely to want for one of the combinations given in the table. His opponent need not take any trick, though if a ten or an ace is played he generally tries to do so, since such cards count towards his score at the end of the came. He may also wish to take a trick because he wishes to declare one of the combinations enumerated. He need not follow suit, and may take a trick by playing a higher card of the same suit or by trumping.

Whichever player takes the trick turns over the two cards, and then either declares any combination he may wish to do, or takes another card from the top of the pack. His opponent takes the next card, so that each player makes up his cards again to eight. One of the drawn cards may provide a card of a required combination, but a player cannot declare until he has won another trick. He must, too, declare anything before taking another card.

The trump card may be an important one, e.g. the ace or ten, and a player may exchange it with the seven of trumps, if he holds that card, on winning a trick. Playing either seven of trumps in this way, or playing it on a trick, except when playing the last eight cards, entitles the player to score 10.

When to Declare Bezique

Each declaration, as made, must be laid down face upwards on the table. Bezique is declared by placing the proper queen and knave on the table. The bezique queen and knave must be of opposite colour and neither may belong to the trump suit; i.e. bezique must either be queen of spades and knave of diamonds or queen of clubs and knave of hearts. Double bezique may be declared either by placing both queens and both knaves on the table, or by first declaring bezique and then afterwards adding the other two cards. But all four must be on the table at the same time to obtain the double bezique score. Should the bezique be declared and the cards afterwards played, the player may afterwards hold the second queen and knave, but he can only declare bezique with them and not double bezique. The same rule applies to all combinations, i.e. all the cards of that combination must be on the table at time of declaration.

Sequence consists of ace, ten, king, queen, and knave of trumps. The king and queen may be declared first (but not afterwards) as a royal marriage, and the other three cards added when convenient. In some forms of the game a royal courtship is allowed, scoring 20 points. This consists of the knave and queen of trumps.

Use of Cards a Second Time

Cards once declared in a combination cannot be used again for a similar combination, as for a royal marriage. Such cards, however, may be used a second time in different combinations, e.g. the ace in sequence may be used to form one of four aces, the queen in bezique may be used with three other queens to give four queens, and so on.

The play goes on as described until the stock between the players is finished, and each player is left with eight cards. Though he may, by his very last card, complete a combination, he cannot now declare it. The last trick before the stock is finished counts 10 points to the winner, and in playing the last eight cards players must follow suit, if possible. If not, they are at liberty to trump. When the final card is played each player goes through the tricks he has won and counts the aces and tens he has in them, these being added to his score.

The following are a few hints on playing. First of all it will be found by a player that he often holds parts of one or more combinations. It will not be always possible to keep all the cards, and one or more cards of a wanted combination will have to be played on tricks. In such a case it is better to keep four kings and four queens than four aces. The two former sets can always be used for marriages and so increase the score.

It is not always advisable to declare or play valuable cards as early as possible. To play one of two kings of trumps before any declaration tells your opponent that you have both kings, and he will not trouble about getting sequence.

When the number of cards in the stock is becoming low, it is advisable to take as many tricks as possible and to declare everything at once, and not separately. That is, if you have sequence, declare it as a whole and lose the royal marriage score.

In three-handed bezique, played with three packs of cards, triple bezique may be scored, counting 1,500 points, and the game is often fixed at 2,000 up. With four-handed bezique, players may either play for themselves or act as partners, as at whist. In the latter case each player may declare when he or his partner has won a trick.

BIB. A baby's bib can be made from a double square of bath towelling bound with white tape, cutting a semicircle from the square to fit the baby's neck and attaching tie-on tapes. Bibs are also made of silk over a pad of cotton-wool quilted and lace-edged.

BICARBONATE OF SODA. In conjunction with cream of tartar, bicarbonate of soda is used in making baking-powder. It is also frequently employed in the making of scones, etc., in the proportion of about ¾ teaspoonful to a teaspoonful of cream of tartar and 1 lb. of flour. For soda cakes it is used without the cream of tartar. If too much soda is used in a cake it will flavour it disagreeably and give it a yellow colour.

It is also valuable as a medicine, being given for indigestion in doses of ten to twenty grains, dissolved in water. It is also taken in the form of compressed tablets, known as soda mints, containing ginger and peppermint. Moistened with water and applied to the part, bicarbonate of soda relieves the pain from insect stings. *See* Baking Powder; Soda Cake.

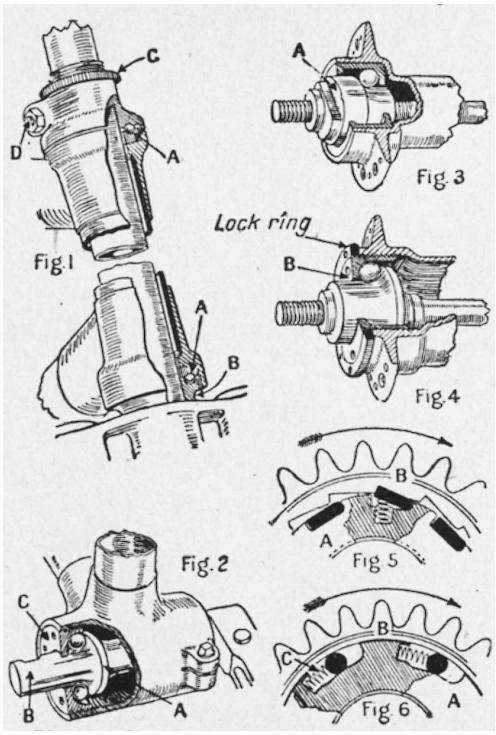
THE BICYCLE AND ITS MECHANISM

Care and Adjustment to Secure Good Running Order

The articles on Ball Bearing; Brake; Chain; Coaster Hub; Three Speed Gear; Tire, and other parts of the Bicycle should be consulted. See also Motor Cycle.

Dealing first with the frame of the bicycle, the two parts requiring attention are the ball races in the steering head and the cup cones of the bottom bracket. To keep out any wet, the cones A (Fig. 1) are a press fit into their housings. These cones may be driven out from the inside and replaced with new. The cone B at the crown of the front forks is only a light press fit, so can be easily replaced. Ball races must not contain a full ring of balls; there must always be one short. The object is to allow freedom of movement for the balls.

When the head is complete, as shown at Fig. 1, tighten down the lock ring C just sufficient to stop all looseness, and no more. After seeing that the handlebars are the right height and square with the front wheel, tighten the nut D.



Bicycle. Figs. 1-6. Diagrams illustrating some of the more important parts of the mechanism.

With the bottom bracket (Fig. 2) the inner cones, A, are in most cases in one piece with the spindle, B, that carries the cranks. The outer races, C, are carried in the bottom bracket shell. In assembling, set the balls in the outer races with vaseline, and first screw the ball race on the chain sprocket side into its original position. This assures correct alinement of the chain over the sprockets. Next screw in the other outer ball race, finally locking by the means provided. When fitting the cranks on to the spindle, take particular note to fit the head of the cotter pins head to tail, i.e. if the head of the sprocket cotter is on top; the head of the other one must be underneath. If this is not observed the cranks will not be in line. When fitting new pedals it will be found that they are screwed into the crank, a left-hand thread being used for the sprocket-crank and a right-hand thread for the other.

The hubs of the wheels follow two distinct types. In one the adjustment is carried out by the cone, A, on the spindle (Fig. 3); in the other the outer race, B, is used as the means for adjustment (Fig. 4).

Where adjustment of the wheel bearings is by the former means (Fig. 3), it is advisable to leave the bearing very slightly slack; the thrust transmitted to the cones by the nuts that hold the wheel in place between the forks will take up the slack that was left.

Should the rims of the wheels be out of truth, remove the tire and tapes that cover the ends of the spokes. Then mount the wheel between the forks, turning the bicycle upside down so that it is supported on the handlebars and the seat, and give it a vigorous spin. Now hold a piece of chalk to the edge, allowing it to approach the spinning rim until it just catches the high

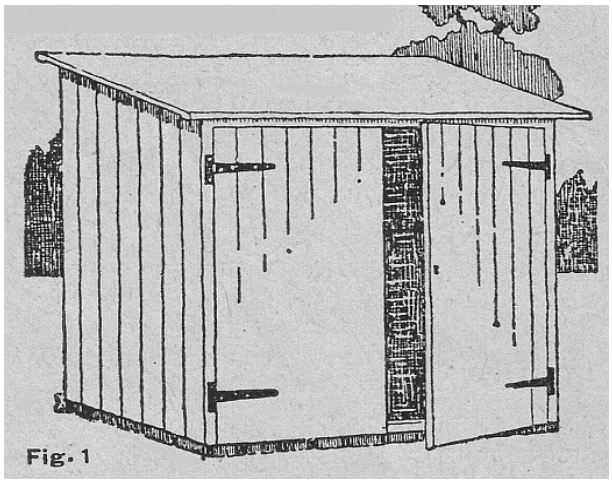
places. Stop the wheel, and with the nipple-key tighten all the spokes on the opposite side to the chalk marks, and slightly let down all the spokes on the same side as the chalk marks. Then wipe off all marks, and repeat the process until the rim runs true. When finished, the tone of all spokes should be nearly the same; but if there is a considerable difference, work at it until a fairly uniform note is achieved. After any adjustment to the spokes, file down any ends that may be protruding through the nipples.

If the machine is fitted with a free wheel it will probably be one of the two types shown in Figs. 5 and 6. To remove the free wheel from the hub of the wheel, first undo the lock-ring. Since this will have a left-hand thread, it must be turned in a clockwise direction. Next, by means of the holes that will be found on the face of the free wheel, slack this off with a punch and a light hammer. In this case turn it in an anti-clockwise direction, as it has a right-hand thread. In most patterns a repair of the mechanism is impracticable.

Of the saddle there is little to be said, except that an occasional dressing applied on the under side with a leather preservative will help to keep it in good condition.

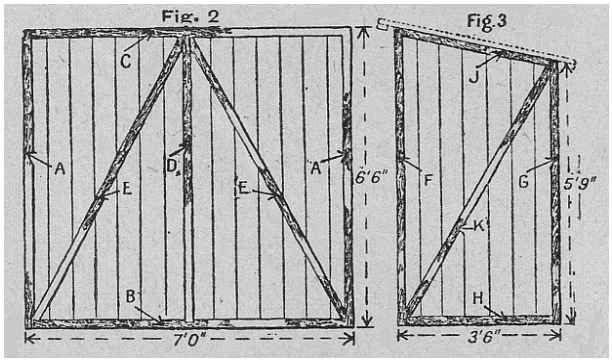
When adjusting the chain remember that there is sure to be a tight place during the complete travel of the chain's length round the sprockets; therefore, find this tight place and adjust accordingly, not too tight. Also note that the wheel is central between the bottom forks, otherwise the machine will not track properly, neither will the chain be in true alinement. Do not forget that, where fitted, the back brake, if of the bottom stay pattern will also need adjustment.

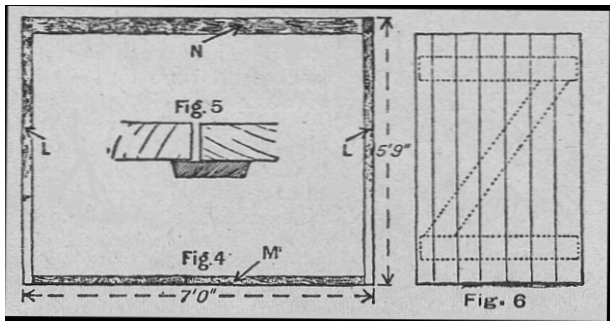
BICYCLE SHED: How to Make. A portable shed for two cycles, framed up in sections, is shown in Fig. 1 . The front, back, ends, and roof are made up in separate parts, and are fixed together with bolts and nuts.



Bicycle Shed. Fig. 1. Simple shed for making which instructions are given in de text.

The framing should not be less than 2 in. square. That in the back (Fig. 2) consists of two end uprights, A, bottom rail, B. and top rail, C, which are half-lapped and screwed together. There is an inner upright, D, which is notched into the top and bottom bars, and nailed in position; and the frame work is strengthened and kept rigid by the stays, E, which are fitted and nailed in position. The ends (Fig. 3) each consist of a back upright, F, front upright, G, bottom rail, H, and top rail, J, which are half-lapped and screwed together. The stays, K, are simply fitted and nailed in position.





Figs. 2-6. Diagrams giving working details and dimensions. (By arrangement with Evans Bros. Ltd., London)

The front framework consists of two end uprights, L, bottom rail, M, and top rail, N, which are half-lapped and screwed together. The top rail should be 4 in. deep, or it may sag when the roof is fixed. The bottom rail should be framed into the uprights so that the face of uprights projects 1 in. beyond face of rail. The ends and back are covered with ¾ in. grooved and tongued match boards, fixed with the joints running from top to bottom. The boards on the ends should overhang ¾ in. at the back edge to cover the edge of the boards on the back. The front and back sections fit between the end sections, to which they are fixed with bolts and nuts.

The roof should be of 1 in. match board, with the joints running from back to front, and overhanging 3 in. all round. The boards are held together with battens fixed across the under side. The roof is screwed on. A pair of doors are made from 1 in. matchboard battened together, as at Fig. 6, and hung with hinges. The left-hand door is fitted with bolts at the top and bottom, and the right-hand one with a lock, while a fillet is fixed on this door, to cover the joint, as at Fig. 5. The bottom of the shed is covered with 1 in. boards, resting on the bottom rails of framing. When complete give three coats of oil paint.

BIENNIAL. Most flower-garden biennials are distinguished by a single main stem, which branches freely above the root. True biennials start from seed one year, flower and seed the next, and then die. Most biennials seed freely and germinate surely, because at the season when they are sown, mid-May to mid-June, the ground is warm.

The following are the most useful hardy biennials. Some are not true biennials, but are best treated as such: Brompton stock, Canterbury bell, chimney bell-flower, foxglove, Iceland poppy, Indian pink, sweet rocket, sweet-william, wallflower, forget-me-not and honesty. *See* Annuals.

Biffins. These dried apples are similar to Normandy pippins (q.v.). *See* Dried Fruit.

BIG BUD. The pest known as big-bud is caused by the black currant mite. The plant which suffers most is the black currant.

In the black currant the developing buds are attacked and swell until they are almost globular in shape, and are about twice the size of the normal buds. As a rule the buds dry up and die in early summer. The natural result of this loss of buds is a progressive decrease in the crop, which may ultimately fail altogether.



Big Bud. Its effect on a terminal bud of black currant.

The disease is dealt with in Leaflet No. 27 of the Ministry of Agriculture. Badly affected bushes should be grubbed up and burnt. In gardens, attacked buds should be destroyed as soon as they can be detected, so as to kill the mites before the period of migration, which is from March to May. The best treatment is to use lime-sulphur on the bushes from early March to mid-May. Here is the mixture:

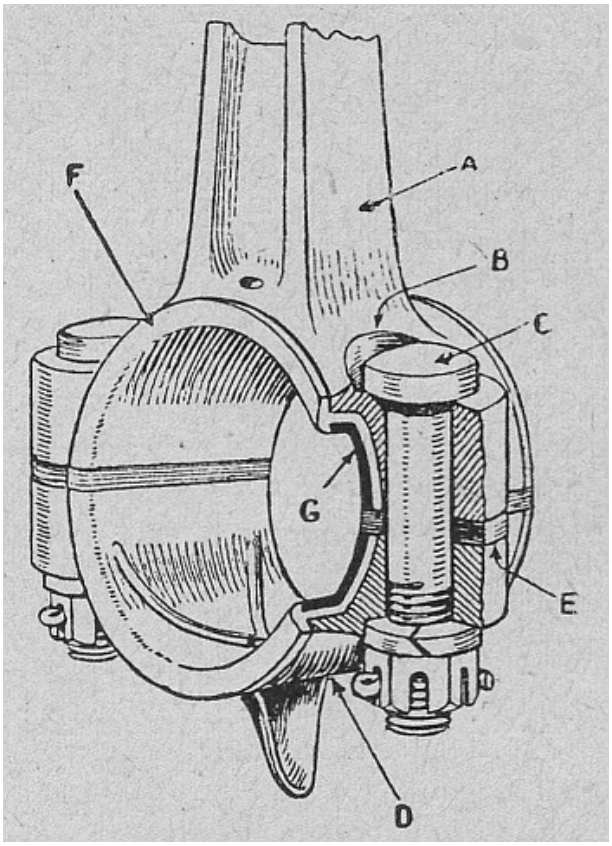
Slake 1 lb. of quicklime; add 1 lb. of flowers of sulphur and 1 gall. of water; heat and stir.

Boil the mixture for ten minutes, stirring all the time; allow it to cool and sediment to settle, then pour the liquid into a bottle, and cork it well.

For use, mix 1 pint with 12 gall. of water.

See Black Currant.

BIG-END. The big-end in an internal cumbustion engine is the larger of the two bearings at each end of the connecting-rod, the small-end or gudgeon-pin bearing being the one on which the piston is mounted. The bip-end in its most common form is of the split type, and the bottom half, or cap, is bolted to the upper half, which is machined integral with the connecting-rod, by two or more bolts.



Big-End bearing of type used for internal combustion engines.

The illustration shows a bearing of common type. A is the connecting-rod with big-end housing drilled and countersunk at B to receive the bolts, C, that hold the cap, D, in position, also oil ways. These bolts are secured by a castellated nut and a split pin. The cap, D, is drilled centrally at the bottom, and fitted with a scoop for picking up oil to lubricate the bearing as it passes over the oil sump located in the crank case.

Between the cap and the upper half of the housing are placed two packing pieces E, known as shimms. These are formed of a number of very thin sheets of brass, and are provided so that wear in the bearing may be taken up. The housing, F, called the brasses, is in two pieces and of phosphor-bronze, having a shoulder at each end to locate it in the main housing, and is machined rough on the inside and recessed, as shown, to receive the white metal lining. The white metal, G is cast in, turned nearly the correct diameter and finally scraped a true fit to the crank pin.

Big-end bearings on motor-cycle engines are solid and not split, as in large engine practice. They are constructed with a phosphor-bronze bush, or with roller or ball bearings, roller hearings being most favoured. The usual construction of a motor-cycle crankshaft allows of the big-end being slipped off the crank-pin on parting the two fly-wheels that go to form the crankshaft.

Repairs to Split Bearing. To get at the big-end on the majority of engines fitted with the split type

bearing, it is only necessary to remove oil sump, thereby exposing all the connecting-rod big-ends to view. Dismantle the bearing requiring attention, and withdraw the connecting-rod with piston down past the crankshaft. This can be done on most modern engines; otherwise it will be necessary to take off the cylinders and withdraw it from the top.

To take up wear in a split type bearing proceed as follows: Thoroughly cleanse off all oil and dirt. Next remove one thickness only off each of the shimms; then very thinly coat the crankshaft with a mixture of thin oil and blue mineral or red lead. Replace the housing en suite on the crankshatt and bolt up tight, giving each bolt a half-turn alternately to en-sure keeping the pressure on each equal. The connecting-rod should now be given one complete turn (not more), then carefully dismount to avoid disturbing the marks that the blue coating has made on t he high places on the white metal housing. These high places should now be very carefully scraped off with a proper scraper. Having done this, clean and remount the bearing, following exactly the same procedure, and continue until there is practically an even film left all over the faces of the white metal. Always bear in mind that any white metal removed from the unmarked surface means that an equal amount has to be scraped off the entire face to correct the error.

On finally cleaning and assembling remember that the connecting-rod must on no account be an easy fit, neither must it be too tight; if held horizontally with piston and gudgeon-pin in position, it should have a tendency to fall a little way only. This test can only be applied when the crankshaft is removed from the engine. *See* Bearing; Motor Car; Motor Cycle; Piston.

BIGNONIA. With brilliant flowers of varying colours the bignonia flourishes in the greenhouse, and is a good climber for roof, pillar, wall or trellis. Propagation is effected by cuttings in the autumn, and inserting them in sand under a bell-glass or a frame or in a propagator. Loam and half peat, with sand, form a suitable compost. They are better planted out in pots. Magnifica, crimson, and Tweediana, yellow, are suitable for the greenhouse. Capreolata, orange-red, may be grown against a sunny wall out of doors. Pron. Big-no'-ne-a.

BILBERRY. Growing wild in woods and moorlands, this fruit is also known as the blaeberry in Scotland and the blueberry in America, and is much used for making jam and tarts by reason of its distinctive flavour.

Bilberries should be washed and picked over before cooking, and are then steamed in a jar placed in boiling water, allowing about 2 oz. sugar and 2 tablespoonfuls water to each lb. of fruit. With a short crust the berries make a delicious tart. For jam-making the fruit is preserved as in recipes for black currant (q. v.). This is essentially a home-made jam, and is not often to be obtained in the shops, the reason being that the demand far exceeds the supplies available. The bilberry leaves a stain on table linen and light-coloured garments which is hard to remove unless treated immediately with cold. If the stain has dried, it is best to stretch the material across a basin, pour hot water over the affected parts and afterwards apply fresh lemon juice.

BILIOUSNESS. Eating too much rich indigestible food often results in a bilious headache, especially with those who suffer from indigestion. In normal conditions poisonous substances formed during digestion are rendered harmless by the liver before they reach the general blood stream, but in in digestion these substances may overwhelm the protective resources of the liver, and accordingly we have symptoms of poisoning in the shape of malaise, physical and mental, and sometimes pronounced headache, with or without vomiting. The latter is beneficial, as it rids the stomach of much of the disturbing material.

Bismuth salicylate in 10 grain doses three times a day or 10 grains each of bismuth carbonate and sodium bicarbonate will be useful. Two grains of calome1 at bedtime and 2 drams of Epsom salts in half a glass of water on an empty stomach in the morning will assist in clearing the liver and intestines. Very little and simple food should be taken.

A sick headache is a different thing, though people who are subject to it may precipitate an attack through indiscretion in diet, it may follow overwork or worry or other cause. In this form eye trouble is not uncommon. Some people who require glasses have periodical headaches; a visit to an oculist obviates distress and the taking of a lot of medicine.

Bilious attacks in children are, as a rule, simply bouts of acute dyspepsia due to overeating or the eating of too rich or not quite fresh foods. The only treatment needed is a teaspoonful or so of castor oil and a starvation diet for twelve hours.

Sometimes what may be considered to be mild bilious attacks, occurring at intervals of a few months, with vomiting and more or less severe abdominal pain lasting for a day or two, may be mild, recurrent appendicitis.

The greatest care should be taken here in prescribing purgatives, and if there is the slightest abdominal tenderness (particularly over the lower right abdominal area), the physician should be sent for.

In some children there is an inherited incapacity of the liver which gives rise to repeated attacks of biliousness on the slightest occasion. These begin about the age of three or four years. A railway journey, a visit to the seaside, fatigue, a fit of anger or grief, paddling, or exposure to cold wind may, for example, be enough to bring on an attack of biliousness with vomiting.

Treatment consists in putting the patient to bed in a quiet, darkened room and giving no food whatever. A glass of hot water or ice sucked at intervals relieves the thirst. Hot fomentations or a hot bag will ease the pain.

As soon as the vomiting ceases, give the child two to four grains of grey powder, followed by a small dose of Carlsbad salts after six or eight hours. As soon as the aperient has acted, give some light nourishment, such as milk and soda-water, iced whey and jellies. Next day plain, ordinary diet may usually be resumed. Sodium carbonate, in 5 gr. doses, in milk before breakfast might be given to the patient for some days, and doses of Epsom or Carlsbad salts every three or four days. *See* Appendicitis; Diet; Indigestion.

BILL: Tradesman's Account. An account contains a list of the items purchased, with the price opposite each, and the total.This bill should be checked at once. If any mistake is discovered, the liability should be at once repudiated in writing, a copy of the letter being kept. An example of such a letter is the following:

2 January, 1931.

"Dear Sir,—With reference to your account delivered this morning, I want to call your attention to two items, one of Dec. 2 and the other Dec. 15. I ordered the joints on that day myself at your shop, and paid cash across the counter. Please correct mistake in your books.

Yours truly,

ANNIE JAMES."

It is important to write at once. If nothing is done till the tradesman renders his statement to account rendered overwhelming evidence will be required in a court of law to prove the money not owing.

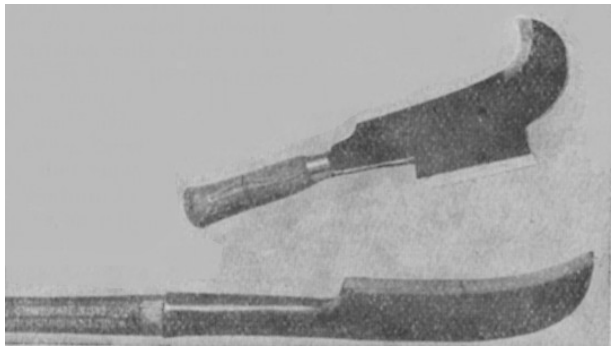
Where sums of money are paid at intervals on account, the tradesman can appropriate the payment to any of the items owing. The householder, on the other hand, can also appropriate it to any he likes, and he has the first choice. It neither party appropriates the money to a specific item, the payment is by law considered to be appropriated to the oldest of the items. This is important when considering the question of old accounts, which are irrecoverable after six years, unless something is paid on account, or some acknowledgement of indebtedness is made within six years before the action is begun.

It is not the case that if an incorrect bill is sent in by a tradesman, the debtor need not pay it. No one, except a solicitor, is ever bound to send a bill in at all, unless he expressly agreed to do so. If the bill is not correct, send or take the amount really due, and if the tradesman refuses to accept it, pay it into court with a plea of tender before action when sued. If it is the correct amount he will have to pay all the legal costs. *See* Accounts.

BILLBERGIA. This plant is sometimes grown in greenhouses in England. It possesses thick and fleshy leaves on a short stem, and bears large heads of blossoms in late autumn and winter.

Equal parts of loam and peat, with a little decayed manure and a sprinkling of sand, suit them. Suckers form at the base of mature plants, and these can be used for purposes of propagation. The best species are B. moreli, blue and rose; B. thyrsoidea, scarlet; and B. vittata, green, red, and violet. Pron. Bil-berjy-er.

BILLHOOK. In its various forms the billhook is a useful tool for wood-chopping, sharpening the ends of stakes, and cutting down bushes or brushwood. The short-handled handbills, however, are the most serviceable for chopping firewood.



Billhook. Above, small bill with chopping blade. Below, hedging tool, which has a long handle.

When cutting sticks, faggots, or kindling, the cut should be made at an angle to the stick, cutting from the thick end in the direction of the thin end, and not straight across. The same priciple is applied when cutting growing timber; undergrowth is best cut with an upward slashing blow. The long-handled billhook is used for hedge cutting, or in places otherwise out of reach. A bilhook needs a keen, sharp edge.

Most workers will find it best to hold the edge of the bill away from the body. The object of the hook part is to facilitate cutting growing timber.

BILLIARD BALLS AND CUES. The standard size for billiard balls is between 2 1/16 in. and 2 3/32 in., and they must be of equal size and weight. Ivory balls are used in British official championships, both amateur and professional, and are generally employed in first-class play. When buying a set of ivory balls, a fair price should be paid to get a well-seasoned set made of the right kind of ivory, and they should be bought 2 1/16 in. full, thus allowing for adjustment.

A new set of ivory balls ought to be kept in the billiard room for a week or two to get accustomed to the temperature before they are taken into play, and at first they should be just tapped lightly while playing a series of gentle strokes, a process which hardens the texture of the surface of the balls; it is well worth while to humour a set of new ivory balls for a month in this way before playing an ordinary game with them. Any chalk on the balls should be removed with a cloth.

They should not be handled any more than can be helped, and in particular the ivory ball should not be held in the hand while waiting to play. On a damp day especially the balls are all the better for an occasional rub while play is in progress.

Professionals know that it spoils ivory balls to

leave them in the pockets when play is finished, and are careful to place their set in a proper box lined with soft material. *(See* Fig. 4). Nor would they leave ivory balls on a window-sill exposed to cold and draughts, or on a mantelpiece when the heat of a fire would ruin them at once. This explains why a professional will have a good set of ivory balls in use for years.

Composition balls, which are not affected by changes of temperature, are cheaper and more lasting than ivory. They are much in favour where economy is the deciding factor, although they are not so pleasant to play with and do not throw quite the same angle as ivory. Their absolute truth is a strong point in their favour, their durability is another, and so is the fact that all sets of one make are alike, whereas ivory may differ very considerably. For snooker and other pool games requiring a large number of balls the low cost of composition is an important consideration.

Composition balls, however, need much more cleaning, as chalk marks and dirt of all kinds stick to them more easily. They should be washed in warm water, rubbed thoroughly clean and dry and then given as much polish as they will take from a perfectly dry cloth.

Size and Weight of Cues

Billiard cues of any weight or size are permitted by the rules of the game. In practice, weights vary from 14 to 18 oz., but size as regards the length of stock cues does not vary so much as it might. Many faults might be remedied if cues suitable for very short or very tall people were more readily obtainable. Cues under 15 oz. are seldom used, but the championship has been won by a player using an 18 oz. cue. Generally from 15 to 16½ oz will cover every requirement, and it is preferable to have a cue heavy rather than light. When it comes to judging a billiard cue, appearances are even more deceptive than usual. No matter how high the polish may be, anything whippy should be rejected at once, and wood twisted in the grain, especially towards the point of the cue where it slides over the bridge-hand, is another thing to guard against.

When play is over, the cue should be replaced in its case, as no cue will keep straight if it is left leaning against a wall. If the cue feels sticky as it slides over the bridge-hand, it should be rubbed briskly with a dry cloth or a sheet of paper, but not sandpaper. The use of sandpaper to remove temporary stickiness wears the wood away unevenly in a very short time, and renders the cue useless for real billiards. Sandpaper may be used with advantage on the leather tip of the cue. Constant play makes the tip hard and shiny, and if it is lightly rubbed against the grain of the leather with a piece of coarse glasspaper, or even a wood file, a constant source of miss-cues will be removed.

How to Tip a Billiard Cue

When tipping a cue, the first thing necessary is a flat true surface on which to lay the new tip. Useful little machines are sold which do this troublesome job very neatly, but if it has to be done by hand it must be completed well and truly. Select a tip as nearly as possible a perfect fit, soak the adhesive wafer in hot water, adjust the tip firmly and accurately, and leave it to dry thoroughly. If proper care is taken, especially as regards selecting a tip which fits, there should be small need for trimming and filing. But if this has to be done, never allow the woodwork of the cue itself to be touched by file or sandpaper. The tip must be made to fit the cue, not the cue sandpapered to fit the tip. The tip of a cue should be large rather than sma11.

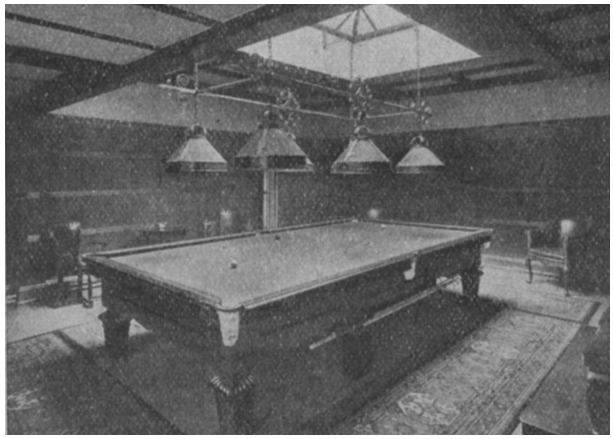
Besides the ordinary cue, there are the long-rest and the half-butt, which should be kept straight and well tipped. It is better to lay them on the floor under the table than to try to prop them up in a rack.

Cement for fastening the tips of billiard cues is made by soaking 1 oz. of isinglass in 2 oz. of water, and adding 1 oz. of glacial acetic acid, warming together until dissolved.

THE BILLIARD ROOM AND ITS ACCESSORIES

General Information on Lighting, Heating and Equipment

The main requisites of the game are considered in the preceding article, Billiard Balls and Cues, and in that on Billiard Table, while the construction of some of the lesser accessories is dealt with here.



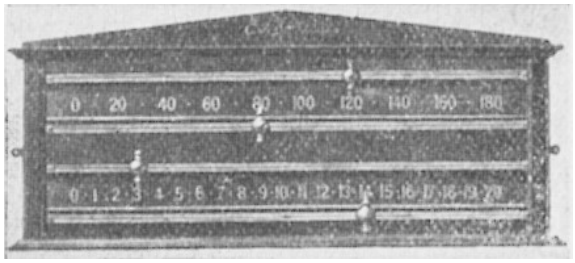
Billiard Room. Fig. 1. Well lighted room in a private house. Note the strips of carpet and , right the raised seats for onlookers. (Bedford Lemere)

The ideal billiard room is built on a ground floor with brick or concrete supports for the legs of the table and should be a substantial and well-lighted structure. A skylight for play during the day is the only perfect natural light, as a side-light which throws shadows as the balls lie on the table is most disconcerting. Ventilation is also helped by the skylight, parts of which should open to let out smoke and allow fresh air to enter; but an open sky-light should always be watched in case of rain.

Electric light is the best artificial illuminant, but gas mantles are quite good, though the wasteful naked flame should be avoided. Whatever light is used, the shades should be adjusted so that the full glare of the light cannot catch the eye of a player as he shapes at his

stroke. A well-arranged room in a private house is illustrated in Fig. 1.

The heating of the room requires careful attention, as both balls and table are very sensitive to changes of temperature, and the game is not pleasant to the players if the weather is cold and the heating insufficient. One of the many systems of heating by pipes radiators is far better than an open fire, which should be avoided on account of the glare, the dust and the impossibility of maintaining an equable temperature.



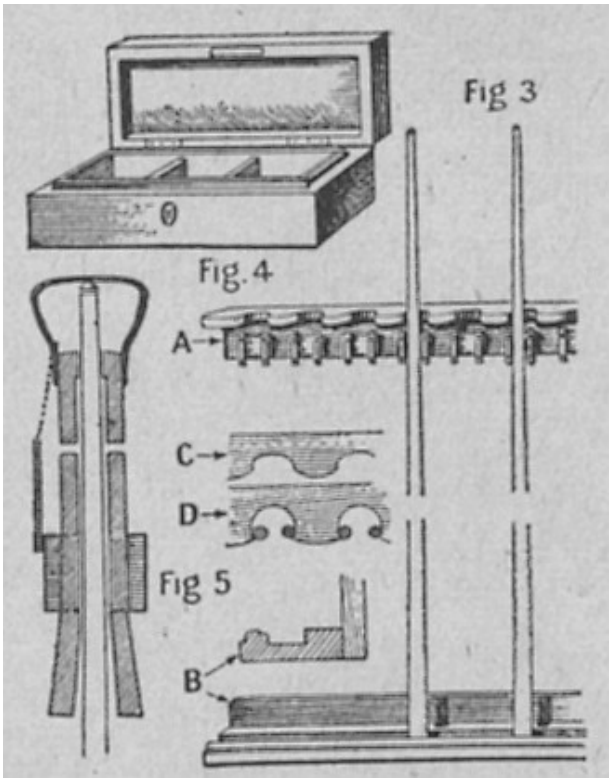
Billiard Room. Fig. 2. Standard pattern marking board, with scorers sliding on brass strips.

The space required for a full-sized table is rather more than 21 ft. by about 16 ft., which must be clear space after allowance has been made for settees. A little less is possible, but the measurements given allow a margin of comfort. The floor covering should be of woven material where the feet of the players tread on it. The marking board (Fig. 2) and cue-racks must be well made and kept in good order. Nothing is more annoying than a marking board which sticks, or cue-racks fitted with cheap clips which disfigure the cues with band-like marks.

But for every fortunate possessor of an ideal billiard-room there are many who cannot get absolutely the best of everything. The most usual shortcoming is lack of ground-floor accommodation, which generally means that a top light is impossible. When this is the case the upstairs room selected for the table must be strong and well built, for a billiard table is a heavy piece of furniture, and if it begins to settle down unevenly it is at once out of truth and useless.

Those who have to fit a table of less than standard size into an ordinary house will be well advised to make sure they have room enough to play properly. A small table in a room too small for it not worth having, and the same may be said of small tables which are set up without due regard to levelling. In an ordinary house, especially if fitted in an upstairs room, these small tables take time to settle down,and often require readjusting more than once before they can be depended upon. For the rest, everything which applies to the ideal room for a full-sized table is applicable to the small table; but when it comes to making the best of what must necessarily fall a good deal short of the ideal, the light is the last thing which should be allowed to suffer.

A badly lighted table, be it large or small, is an abomination, and there is no reason why the small table should suffer in this respect. Generally a top light is out of the question, so that it is all the more important to arrange the best of artificial light, as all play will be dependent upon it, so far as seeing the balls well is concerned.



Billiard Room. Fig. 3. Cue rack. Fig. 4. Padded box for billiard balls. Fig. 5. Sectional view of a cramp for a billiard cue.

There are various styles of cue-racks and stands. The wall rack is simple to construct and quite efficient. It is conveniently made in two lengths, the one fitted with the slotted ledge (Fig. 3, A) above a rail, which is fitted with equally spaced spring clips and secured to the wall by brass-plates and screwing. The rail can be of ¾ in. thickness and 4 in. or so wide, with the ends and under edges plain or moulded ovolo as preferred. The spring clips are purchasable from a good-class ironmonger in dozens, and merely require screwing into equally spaced positions. The shaped ledge above is screwed and glued on, and the clips are fixed on the centre line of each recess so that the cue lies evenly within it. Width of this ledge can be about 2 in. and its shaping a repeat such as Fig. 3 C.

The revolving cue-stand is specially suitable for some rooms, but as it is not likely that a player would undertake its construction we do not give details. These stands can often be obtained second-hand at low prices.

The amateur craftsman might, however, exercise his skill in the making of a box to take three balls, as illustrated at Fig. 4. Finished dimensions can be 8¼ in. long, 3½ in. deep and 2¾ in. high. The lower box portion can be 1½ in. high, and the workmanship is usually of the best. Sides, back, and front are carefully dovetailed together of ½ in. or ⅜ in. mahogany, and a

¼ in. bottom rebated in. The lid is dovetailed together in similar fashion, and the top rebated in. A separate partitioned box is inset, made from 3/16 in. thickness, mitred together, and finished to project with bevelled edge about a full ¼ in. above the box.

A cue cramp (Fig. 5) is an essential accessory of every billiard room. In action, the cue top is passed through the centre of cramp, and the cemented tip compressed into position by forcing down the stop upon it and securing it in position by pulling down the cramping ring over the cuts in the splayed end. In addition there is a hole to take a small length of file with which any unevenness of tip or adhesive is corrected. The file is holed at one end, and a length of brass chain secures it to the stop above.

BILLIARDS: HOW THE GAME IS PLAYED

The Strokes Explained and Illustrated

This work contains also articles on Pool, Pyramids and Snooker Pool

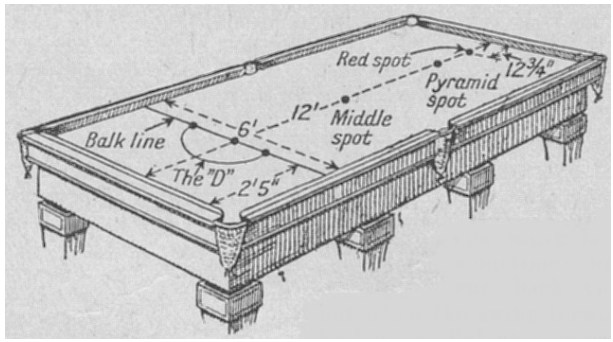
English billiards is played on a table measuring 12 ft. by 6 ft. The spot is 12 ¾ in. from the top cushion, the middle spot is half-way across the table in line with the centres of the middle pockets, and the pyramid spot is equidistant between the middle or centre spot and top cushion. The table has six pockets, one at each corner and two in the middle of the longer sides. Those at the spot end are known as the top pockets; those at the balk end as bottom pockets.

The game is usually played by two to four players. Points are scored as follows: two for a cannon, i.e. when the playing ball strikes the other two balls; two for going into a pocket after hitting the white; and two for potting the white, i.e. driving it into a pocket. Three is the score for going in off the red or for potting the red. A miss counts one to the non-striker; three if the ball is sent into a pocket or off the table without striking a ball. The rules should be consulted for other examples of scoring. Each player or pair of players has his own ball, these being the two white ones, one being distinguished by a spot. Various ways of deciding who shall start first are in vogue. Beginning the game is known as breaking the balls.

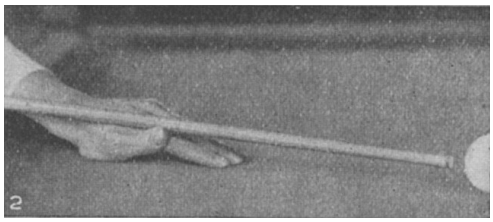
A player can continue playing as long as he scores from every stroke, but as soon as he misses, his opponent takes his place. The total score made by a player without losing his turn is known as a break. If the cue-ball, when at rest, touches either of the other balls, the balls must be spotted and the striker continues his break. Fouls and their penalties are matters concerning which the rules should always be consulted.

Importance of Correct Stance

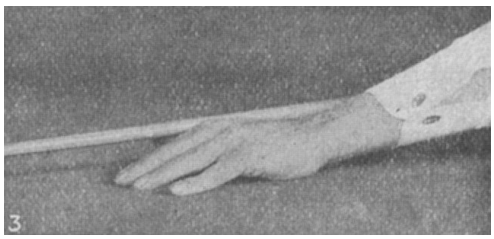
A correct stance is of primary importance in billiard playing, but is difficult to define with exactitude, because players of varying height and physique have to play on a table which measures, from the floor to the cushion rail, from 2 ft. 9 in. to 2 ft. 10½ in. The safest guide to a reliable stance is to remember that absolute steadiness is the ideal in view. A cueman when standing as he should to make his stroke is, above all things, firm and steady. Only his cue-arm, lissom and ready to propel his cue should be flexible and ready for the utmost nicety of movement.



Billiards. Fig. 1. Full-sized table, showing the lines and spots.



Billiards. Figs. 2 and 3. Two views of a good bridge, firm, but not rigid, as made by Tom Newman. (Photos, Wrightson)



As a general rule it will be found that by advancing the left leg and slightly bending the left knee, while the right leg is kept firm and straight, the foundation of a correct stance is assured. The upper part of the body should be bent forwards, the left arm thrown well out and the left hand arched to form a bridge over which the cue slides. The cue butt should be held without force or effort, always bearing in mind that the cue is to be swung at the ball, not pushed or thrust with a movement having continuous and appreciable power behind it.

To gain impetus for the swing, the cue must be drawn back—it is sometimes helpful to draw the cue back very slowly indeed—but when the swing forward is made it should be kept as flat as is consistent with freedom, and must be continued until the cue goes clean through the ball in the line of the stroke. "Let the cue do the work," is continually dinned into the ears of pupils by professional teachers of billiards, and is such excellent advice that no progress can be hoped for if it is ignored.

Face the balls when sighting a stroke, and always endeavour to have the cue-tip on a line taken from fairly between the eyes when the ball is struck by

swinging the cue at it. Never forget the swing—it is all important. In actual ball striking, the first thing to do is to learn to hit the cue-ball truly in its strikable centre. This is by no means an easy thing to do with consistent accuracy, but it must be done, and the best way to master it is by utilising the familiar one-ball stroke, played by placing the cue-ball on the centre-spot of the balk-line and playing it straight over the line of spots.

If struck truly in its centre, the ball should rebound straight to its starting-point. Mostly, however, it will show a tendency to return to the right, which proves that right-hand side is being imparted unintentionally, a fault which must be rectified. To eliminate any tendency to strike the ball above or below centre, it is a good plan to practise this stroke with the spot-ball, adjusting the spot for each stroke exactly where the cue-tip should impinge on the ball. This one-ball practice is admittedly tiresome, but it must be persevered with if real billiards is to be played.

The half-ball stroke with the resultant natural angle is the next step, and it is a very big one, towards aptitude at the game. The half-ball stroke is made by directing the centre of the cue-ball towards the extreme edge of the object-ball. It must be played with the least side on the cue-ball, without strength enough to force the stroke, and with free cueing to impart life and brisk forward rotation to the cue-ball.

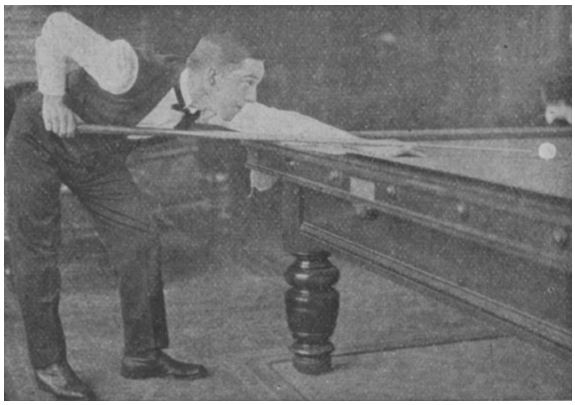
There are four set positions usually demonstrated as showing the half-ball stroke and the natural angle, but in a strictly scientific sense the angles thus shown differ appreciably. In a practical play, however, it is indisputable that the hazards can be scored as described from the following positions.

Place the red ball on the centre-spot and the cue-ball 7½ in. from the centre-spot on the balk line (Fig. 5*)*. Place the red ball on the pyramid spot and the cue-ball rather less than an inch inside either of the spots at the ends of the balk-line (Fig. 6). Place the red ball on the billiard spot and the cue-ball in line with the shoulder of the middle pocket (Fig. 7). Place the red ball on the billiard spot and the cue-ball in the centre of one of the top pocket openings or on a line a shade nearer the top cushion (Fig. 8). If the balls are placed as directed above, and a half-ball stroke played as shown in the diagrams *(see* p. 170), the losing hazard will always result, and if the strength is correct the red ball will travel as indicated by the dotted line in the diagram and stop in excellent position.

Half-Ball Shots the Key Strokes

These four strokes, for open billiards, may be called the key-strokes of the game. Any player who can handle them really well, especially Fig. 5, is well on the way towards cuemanship of no mean order. But unless they are mastered as well as opportunity permits, the making of difficult strokes at uncertain intervals, or even the making of them fairly frequently, will be of very little use. The player who has a sound working knowledge of the half-ball stroke knows what he is doing when he tackles any other stroke on the table. He has a reliable standard of comparison to work by, knowing as he does that a half-ball contact will produce a given result; he can calculate what a contact thicker or finer than half-ball will give him as regards variations from the natural angle.

All this is done, it should be noted, without striking the cue-ball anywhere except in its centre, and it is altogether wrong to regard this as merely a preliminary step towards higher flights in the game. Plain ball striking is the backbone of all billiard playing, and no man can make a break of any size unless he has reasonable command of it. It is an all too common fallacy to imagine that screw and side are the things that really matter, and that the beautiful simplicity of plain ball striking is a mere rudimentary commonplace of no interest.

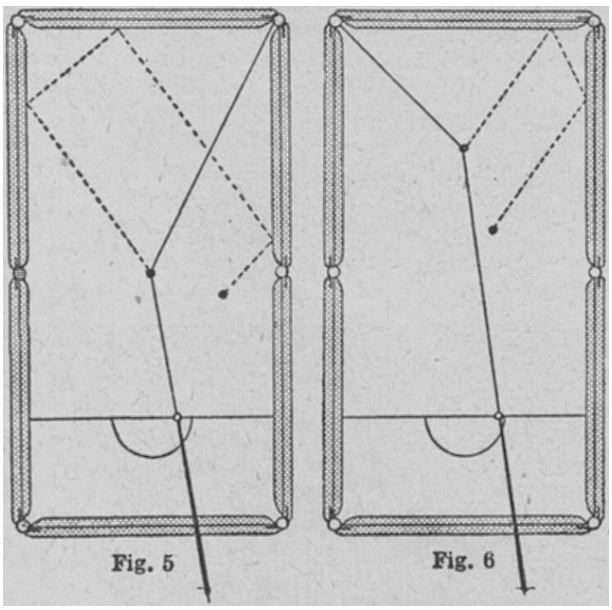


Billiards. Fig. 4. Correct stance and grip of cue, demonstrated by Tom Newman (Photo, Wrightson)

There are, of course, very many strokes which lie beyond the power of plain ball striking; then, and not till then, does the employment of side, top or screw become necessary and justifiable. Side is imparted by striking the cue-ball to the right or left of its centre, as the case may be, and is not so much a matter of striking the ball as far as possible to the right or left, as it is a question of neat and crisp cueing. When putting side on a ball the best results are obtained by keeping the cue-tip on a line struck fairly across the centre of the ball. It is a mistake to put top or bottom on the ball when imparting side, unless it is done purposely to combine side with either of these things.

The action of pure side is to take the ball away in the direction of the side imparted, excepting when a ball is moving rather slowly against the nap of the cloth, when the action of side is reversed. Side has a certain amount of effect on the course of a ball before another ball or cushion is struck, but the effect is much more apparent and decided after contact with a ball or cushion, especially if force is used when a ball is played at and the ball to ball contact is thick. In billiard parlance, mention is often made of running side, check side and pocket side. These definitions are apt to confuse the beginner unless clearly explained.

Place the red ball on the billiard spot, the cue-ball on the centre spot of the balk-line and the second-



Billiards: the key strokes. Fig. 5. Standard half ball shot: cue-ball on balk line, object ball on middle spot. Fig. 6. Standard half ball shot; cue-ball on balk line, object ball on pyramid spot.

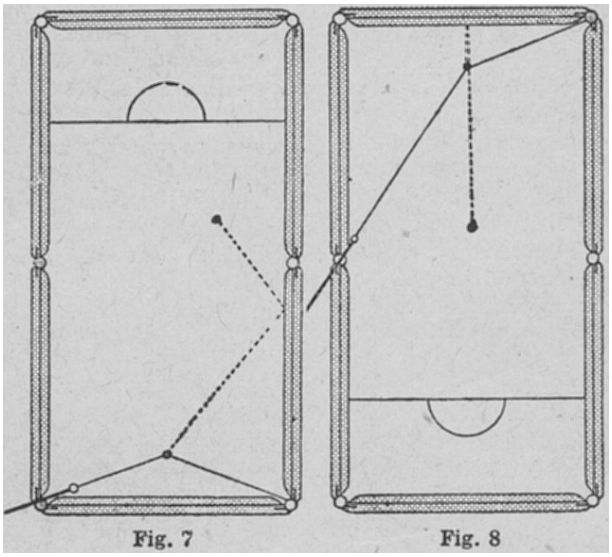


Fig. 7. Standard half ball shot; cue-ball in centre of top pocket opening, object ball on billiard spot. Fig. 8. Standard half ball shot; cue-ball at shoulder of middle pocket, object ball on billiard spot.

object ball near the left balk pocket (Fig. 9).

If a smart half-ball is played on the right of the red with plenty of right-hand side on the cue-ball, it will be seen at once how this side helps the run of the ball off the cushions. If the same stroke is tried with left-hand side, the check action is at once apparent. With running side the cannon is scorable, but there is indeed a difference if the stroke is attempted with check side, which illustrates yet another important attribute of side. This is the effect it has after a side-laden ball impinges on a cushion. At normal pace, if a ball has no side on it, the angles of incidence and reflection are equal when it strikes a cushion and rebounds from it, but running side makes the angle off the cushion more obtuse, wider, as it is called, while check side makes the angle more acute.

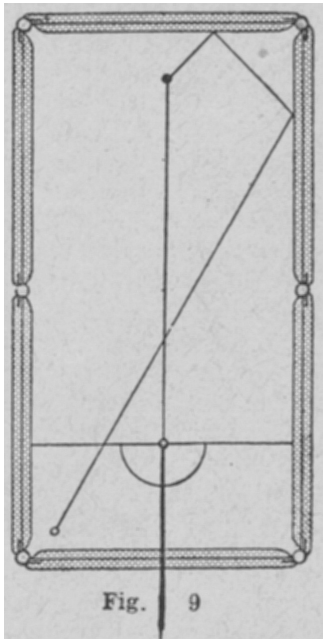


Fig. 9. Half ball cannon; cue-ball on centre of balk line, object balls on billiard spot near left balk pocket.

Screw may be defined as latent backward spin. It may bring the cue-ball back as much as 6 ft. or more after full contact with an object ball lying a foot or so away. When it is clearly understood that the ball must be made to spin backwards as it travels forward, much of the elusive difficulty of the screw stroke is eliminated. The manipulation of the stroke depends on keeping the cue as level as possible while striking freely and neatly well below the centre of the cue-ball and checking the cue with a sudden pinch of the fingers immediately after the ball is struck, not, as is often stated, at the same moment, for the cue must go through the ball, be it ever so little, to set up the requisite backward rotation. The weight of the stroke supplies the forward momentum, the cue-action and the low striking giving the screw effect.

Top is the direct opposite to screw, and is imparted by striking the cue-ball well above its centre. It is mainly useful when playing long follow-through cannons. In a modified sense, so far as striking the cue-ball slightly above its centre is concerned, top helps to impart life to certain strokes. It is, however, as well to avoid the use of top whenever possible, as it panders to inaccurate cueing.

Top may be used in conjunction with side, so may screw, and only experiment is of much use in demonstrating the multitude of effects thus to be obtained. But it cannot be too often repeated that plain ball billiards comes first, and that intricacies such as the combination of side and screw are to be avoided if possible. When employing side or screw it is advisable, as a general rule, to use as much of either as the cue-power of the individual can impart, obtaining any desired result by varying the strength of stroke and the ball-to-ball contact.

Drag means striking a ball low with the intention of preventing it from running untruly when it is desired

to play a long shot at slowish strength. The cueing is more free than is used for the screw stroke pure and simple, and the stroke, although difficult, is worth practising, especially if the table and balls are short of absolute perfection, as drag helps to minimise such defects. Stun is produced by holding the cue heavily when playing rather full on the object ball; the cue-ball is struck rather below its centre and can be made to stop dead, when the stroke is known as a stab shot, or it can be made to travel slowly to make a cannon or pocket, usually a cannon. The stun stroke is very useful when it is desired to send the first object-ball a long way and barely move the second object-ball, many pretty gathering cannons being made in this way.

Break-building can be summed up as the art of playing one easy stroke in such a manner that another easy one is left; in its highest forms, notably in top-of-the-table billiards, it depends upon a sense of touch and insight into the possibilities of the game which amount to a gift. In the ordinary way, however, much can be done if thought is taken before a stroke is made, thought directed towards computing where the balls will be when they stop, usually the last thing the novice troubles about!

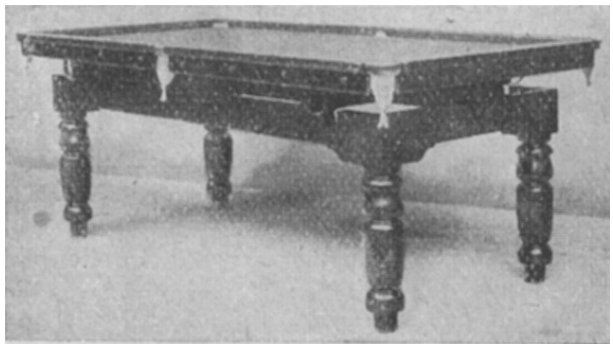
Ivory balls of standard size and equal weight are presumed to be in use when playing the strokes mentioned in this article. If composition balls are used, it will be found that the positions will be apt to vary slightly.

BILLIARD TABLE: Its Care. Because of its bulk and size, a billiard table is apt to be regarded as a fixture which cannot very well come to any harm if left alone, or as something strong enough to stand any treatment short of wilful and malicious damage. The truth is that such a table requires constant attention to keep it in good playing condition, and, although far from fragile, is much more easily damaged than is commonly supposed. Slate, cloth, rubber, wood and a little metal are the raw materials which enter into the making of a billiard table. The nature of these substances differs widely, and to fashion and adjust them into a perfect and harmonious whole is no mean feat of craftsmanship. The cloth and cushions are the most sensitive parts. Damp and cold will ruin the best cushions, so will the player who never uses the rest, but insists on clambering on the table to reach a shot he cannot get at in the ordinary way.

The table should be brushed frequently, always with the nap of the cloth, and the brushing should be so thorough that the fibres of the brush dig well into the nap and fetch out the chalk and dust; a perfunctory brushing is very little use. If a cloth is brushed in this manner it does not want ironing half so often as is supposed, especially if a duster is wrapped round the brush and the table gone over again after the brushing is completed.

When ironing a billiard table the iron should be hot enough to iron linen, but it is too hot if it leaves the least trace of singeing on an old piece of white rag with which the face of the iron should be cleaned before it is allowed to touch the cloth. The iron should be grasped firmly and run quickly up the centre of the table in a straight line with the nap of the cloth, and the operation completed by taking in successive swathes of cloth until the whole is covered, care being taken not to press the iron needlessly against the cushions, especially when ironing near the pocket openings. Above all, do not iron against the nap of the cloth; one such application of a really hot iron spoils the cloth entirely.

When a new cloth has been on for a little time it needs stretching and readjusting- always a job for an expert. This operation throws the original balk-line and spots out of place, and they have to be changed accordingly. Banging a ball on a spot is bad for both the ball and the cloth, and should be sternly discouraged.



Billiard Table. Miniature table, the top of which can be replaced by leaves, thus making a dining table. (Photo, Thurston)

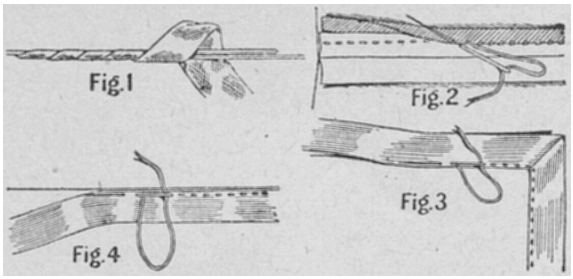
BILL OF SALE. A bill of sale is a document whereby personal goods are transferred or else mortgaged, and is commonly used by people who wish to borrow money on their furniture. A mortgage bill of sale must be in a particular form and registered.

The creditor can only seize the goods for one (or more) of the following causes: (1) default in payment of principal or interest; (2) bankruptcy of the debtor; (3) if the debtor fraudulently removes the goods; (4) fails to produce his last receipt for rent; or (5) suffers an execution to be levied on the goods.

A mortgage bill of sale cannot be given for less than £30. It can only be given by the the true owner of the chattels.

BINDING: How to Apply. Seam edges are sometimes finished with a special tape binding to neaten, and edges of garments are bound with braid, self-material, or a contrasting coloured fabric, as a decorative trimming. In other cases two edges or ends are bound together to secure them, e.g. the ends of a wire sewn to the outer edge of lampshade. etc., and set to a certain shape. Here the binding is done by lapping the ends of the wire a few inches, then twisting a strip of muslin round and round until both ends are hidden (Fig. 1), fastening off with a few stitches. Another method is to fold a long strip lengthwise, and to slip the wire up into the fold, then to sew along

within the edges.



Binding. Diagrams showing how braid or other material should be applied for binding purposes.

To bind seams, place the binding along the raw edge of the seam, so that half its width lies over the material and half extends beyond the raw edge; then hem or run the lapped edge of the binding down, after which turn the remaining or unattached edge over to the other side of the seam turning, and hem down (Fig. 2) so that the turning is sandwiched between. In using braid, sewing-silk of the same colour as the braid should be employed, and the running or hemming stitches should not be made tightly enough to indent the braid. If the braid is to be taken round a corner, it should be set in a mitre (Fig. 3), or if along a curve, the tiny cotton thread generally woven into each edge of the braid should be pulled up to make the requisite shape.

If a very narrow binding is required, another method is followed. The braid is set over the right side of garment, so that none of it extends beyond the edge, but so that the outer edge of braid comes level with garment edge, after which it is stitched on within these outer edges (Fig. 4). The remaining or unattached edge of braid is then turned over to the wrong side of garment and hemmed.

If the edge of a dress, etc., is to be bound with strips of self or contrasting coloured material, the strips must be cut off on the cross, and joined to the required length. The joins must come on the straight of the grain, so that the ends of the strips will be necessarily slantwise and the joins corresponding. To do the binding, follow the second method explained for braid binding, and illustrated in Fig. 4, though in this case, if any curve is to be bound, the strip, being cut on the cross, can be stretched to the desired shape, and need not be drawn up. In binding, carefully note that no part of the garment edge which comes on the cross is stretched in the process. After binding press well. *See* Bookbinding.

BINDING COURSE. In brickwork this is the name given to a row of bricks set across an inner and an an outer course to bind them together. *See* Bond; Brick; Building.

BINDWEED. Two plants bear the name of bindweed or bearbind, Calystegia sepium and Convolvulus arvensis, and both are very pretty, but if once they get out of hand they become weeds of the worst type. The safest means of extirpation is to dig them up by the roots, which usually extend for a considerable distance horizontally underground.

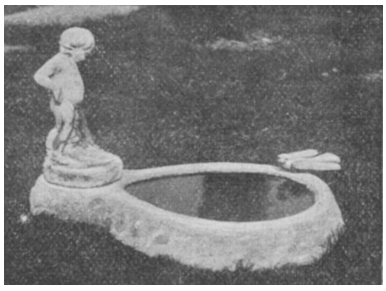
BIRCH. The silver birch, Betula alba, so called because of its shiny white bark, is a most graceful and ornamental tree that flourishes best in light soil. It is a beautiful lawn tree. Planting may be done from Nov. to March inclusive. The birch is raised from seed which is sown as soon as it is ripe or in spring.

BIRCH: In Furniture Making. The wood of the birch is one of the cheaper hard-woods, used for much the same purposes as beech. It is a light brown in colour, close-grained, sometimes with a figure similar to mahogany, and is often stained to resemble that wood. It is easy to work, and has a smooth surface with a rather lustrous appearance. It is used for bedroom furniture and frames of chairs and couches, turned articles, brush heads, casks and tubs, handrails, and dowel rod. Plywood is often made layers of birch, and in this form it is used for chair seats, vehicle bodies, as well as for panels for various purposes.

Birch dowel rod is sold at most hardware and general stores, and by timber dealers, in lengths of 3 ft. and upwards. Diameters are from 3/16 in. to ⅞ in., the most useful size being about ½ in. Cabinet-makers use it for dowelling the frames of chairs and other articles, as an alternative to making mortise and tenon joints. For this purpose it is used in short pieces usually not exceeding 3 in. or 4 in. long. *See* Wood.

BIRCH TAR. Tarry oil obtained from a birch, the Betula alba, and known as birch tar, is used as an application in skin diseases associated with itching, e.g. chilblains, eczema, or psoriasis. It should not be used if the skin is acutely inflamed and moist. A useful combination is birch tar, 1 dram; zinc oxide, 2½ drams; vaseline, 5 drams. *See* Chilblain.

BIRD BATH. One of these shallow stone basins may be put in an open space in the garden to provide water for birds. Some are fashioned like miniature fish-ponds, about 2-3 ft. across and 2-3 in. deep, but a more useful kind stands on a pedestal, and the birds are thus protected from cats. One of these makes an effective centre for a small lawn. It is cheaper and less difficult to erect than a sundial, as it only needs to be kept full of fresh water. If the basin is a large one, it may have a raised stone in the centre as an additional perching ground for the birds.



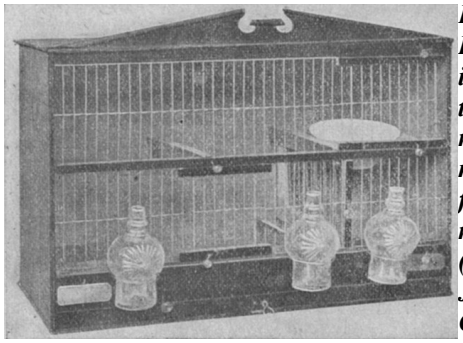
Bird Baths in stone, the above one a meditative cherub on its brink. (Sussex Gardens Ornaments)



Bird bath having a circlet of dancing pixies (J. Panichelli & Sons)

BIRD CAGE. The designs and types of birdcages are innumerable, but they all naturally divide themselves into two types, viz. all-wire cages, with which must be grouped cages of light wood framing and open wirework all round, and box cages.

The danger of the all-wire cage lies chiefly in the fact that cold wind or draught can pass through it, and if this cage is placed in a window it becomes a death-trap for even the most hardy species of birds. This danger can be eliminated by placing the cage against a wall, and in such a position that no current of air can pass through it from end to end. If it must stand in a window, then the only safe procedure is to surround it on three sides with clear glass. The screen must be the full height of the cage, and be placed between the cage and the window. Thus an all-wire cage can be made a safe habitation for all species of birds.



Bird Cage. London breeding cage containing a separate compartment and rest for the birds on right. (Courtesy of J.J. Thomas & Co., Ltd)

The best cage is of the box type. Every cage, whether its materials be of wood or metal, should be fitted with a metal draw-tray for cleaning convenience, and the food receptacles ought to be so placed as to be easy of access both to the birds and their owner.

As to the size of the cage, it must be sufficient to allow the occupant to move about and perch without fraying or otherwise damaging its plumage. It must be large enough for the bird to turn about without bending its tail feathers, and the perches so placed that its head does not rub against the top of the cage or its tail come in contact with the floor of the cage. A small active, vivacious bird no larger than a wren often needs a larger cage than one four times its size. It is an indisputable fact that to put such u bird in a cage in which it can merely hop and not move about freely is to rob it of any chance of a long or happy and contented life. Many species of birds become corpulent and fall into ill-health if they cannot take some wing exercise.

For canary fanciers both type and size of cage are regulated by the governing body of each variety. For other species the cages are invariably of the box-type, and the novice exhibitor had better leave himself in the hands of the cage-maker.

Of parrot cages there are three types—round, square, and rectangular. The rectangular is too large for the average room, and of the two former the square is the better, as a cage of 2 ft. sq. contains more space than one of 2 ft. diameter.

Cages should have a spring and autumn clean, when they need to be scalded with some insecticide solution, dried, distempered inside, and the exterior re-stained. *See* Aviary; Canary; Parrot.

BIRD CHERRY. This is a name sometimes given to ornamental flowering cherries. The botanical name of the tree is Prunus padus. A native of Britain as well as of Manchuria, it is a hardy, May-flowering tree, often attaining a height of forty to fifty feet. The flowers take the form of pendulous racemes six inches in length, and are white or pink.

The bird cherry thrives in ordinary loam, and is best grown as a specimen tree on a lawn, or grouped in park or woodland. It is rather too vigorous a subject for the ordinary garden.



Bird Cherry. Sprays of hanging blooms of the ornamental flowering cherry.

BIRDLIME. Made in Japan from the bark of the holly, birdlime is the chief ingredient in fly-papers and fly-strings, and is also used for spreading on boards to trap mice and rats. Artificial birdlime for the same purposes is made by melting together boiled linseed oil, 6 oz.; gum thus, 1 oz.; and castor oil, 2 oz. This is applied, while still warm, by means of a stiff brush. *See* Fly-paper.

BIRD LOUSE. Bird lice are unrelated to the true lice, and are more of the nature of scavengers, feeding upon scurf, skin secretions, hair and feathers. They are small, flat, wingless insects of the order Platyptera, and have mandibles armed with sharp teeth. They affect domestic poultry and pigeons chiefly. The eggs are attached securely to the hairs or feathers. Where they cause annoyance to pets, finely powdered sulphur or insect powder should be blown into the plumage.

BIRD SCARER. The scarer shown in Fig. 1 is driven by a windmill, which revolves a rod, and causes two metal plates to clap together. The post and arm, Fig. 2, are 1½ in. square, half-lapped and screwed

together, the post being pointed for fixing in the ground. The windmill is attached to a hardwood rod, Fig. 3, which is 13½ in. long over all by ½ in. diameter, working through a hole in the post bored in the position shown at Fig.2. The stock of the windmill, Fig. 4, is 3 in. in diameter by 1½ in. thick, with a ½ in. hole in the centre to fit the rod.

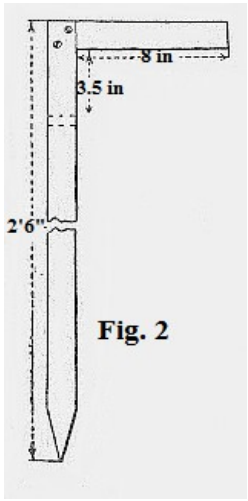


Fig. 2

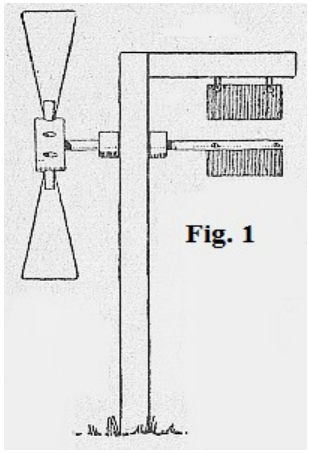


Fig. 1

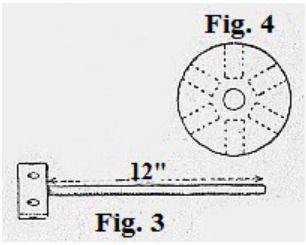
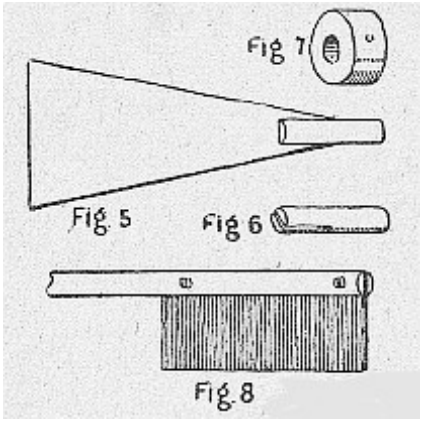


Fig. 4

Fig. 3

Bird Scarer. Diagrams showing how to make an apparatus worked by wind.



The six sails Fig. 5, are 6 in. long by 3 in. wide at the ends, tapering to ½ in., by about ⅓ in. thick. They are fitted to dowels, Fig. 6, 2 in. long by ½ in. diameter, having slots 1 in. long to receive the sails, and bored 1 in. into the stock. This method of fixing the sails allows of their being easily set on the angle to catch the wind from whichever direction it may happen to be blowing.

Two round fixing blocks, Fig. 7, are required to adjust the rod to its correct working bearing in the post. The blocks are 1½ in. in diameter by 1 in. thick, having ½ in. holes in the centre to fit the rod, while a small hole bored from the circumference to the centre admits of a small pin being driven through and into the rod when the blocks are finally adjusted. The metal plates are 4 in. by 2 in. by about 1/16 in. thick. The plate on the arm is attached with two wire staples, while that on the rod is fixed by making a saw cut in the rod and driving two small screws, as illustrated in the diagram, Fig. 8. *See* Scarcrow.

BIRD SEED. The principal seeds used as food for cage birds are canary, flax, hemp, millet and rape. The first named is the flattened yellow seed of canary grass; flax or linseed is also compressed, but smaller and brown in colour, and produced by the common flax. Millet is the round, hard seed of Sorghum vulgare, the guinea corn; hemp, the large, roundish grey seed of Cannabis sativa; and rape is the dark shot-like seed of a variety of the turnip. To these may be added the seed spikes of the plantain obtainable from any plot of waste ground; and for the larger birds tares, Indian corn, and the seeds of sunflower. Seedheads of thistles are appreciated by some finches, who pick the seeds from the thistle heads with avidity. *See* Aviary; Canary, Parrot.

BIRDS' EGGS. In making a collection of birds' eggs the first thing to do is to acquire some practice in the handling and preparation of the specimens, in order to avoid spoiling them and thus taking eggs wastefully.

The easiest and simplest way to blow an egg is to make a hole in each end with a pin and then blow out the contents with one's mouth. This method may be tried on the common eggs till one is sure of holding the egg so judiciously as to escape breakage. A drill and blowpipe should then be got from a dealer in natural history requisites, and some eggs blown by the proper method of making a neat round hole in the centre of one side, and expelling the contents through this alone. In both methods a pin should be inserted to break up the yolk before the blowing process is begun. If an egg is hard-set, the embryo bird should be snipped to pieces with a pair of fine scissors, and the bits withdrawn with a pair of fine-pointed forceps, but the taking of such eggs should be avoided wherever possible.

When cleared, the eggs should be thoroughly washed out with water injected by means of a fountain-pen filler or similar instrument; care should be taken to avoid wetting the egg more than can be helped. After washing out, the hole or holes in the egg should be closed by gumming a tiny disk of paper over the opening; the egg is now ready for the cabinet, and should on no account be varnished. Neither should the eggs be gummed on a card or strung on strings, as is sometimes done. The eggs of some water-birds have a chalky coating, and this should not be scraped off.

For keeping eggs till one has a cabinet ready, chip pill-boxes bedded with any soft material will do; each egg should be marked with a number with a fine pen and marking ink, and the numbers should be entered in a notebook with the name and any other particulars opposite. For exhibition in a proper cabinet, the best bedding is black cotton-wool; the name labels can be gummed on to the edges of the partitions. Ducks' eggs should be bedded on a little of the down with which the bird lines the nest, since this down differs according to the species of duck, and is a considerable help to

identification.

Identification of Birds' Eggs

Practice in the blowing of large eggs like these should be obtained with the eggs of ordinary ducks and of fowls. In the case of large eggs it is often only convenient to exhibit one, and indeed to take only one egg from a nest is a good rule in the case of most birds. It is the taking of the whole set, and the accumulation of numerous sets of the same species, regardless of its scarcity, that has brought egg-collecting into disrepute.

In order to be sure of the name of an egg one must not take it till one has seen the birds, or one of the birds, to which the nest belongs. As often as not an egg cannot be identified apart from its producer by a beginner, and even the expert may be unable to distinguish between the eggs of some species. This is most often the case when the birds are nearly related; thus, the eggs of the various tits are often very hard to distinguish.

Sometimes the eggs of quite different birds may be alike, as in the case of the sedge-warbler and the yellow wagtail. In this case, however, the nest is some help, for that of the sedge-warbler is constructed in the bushes, while the yellow wagtail's is a rough affair built on the ground among the grass.

The thrush's nest is very characteristic with its plain hard lining of mud-plaster; but though the bright blue eggs, with their few and distinct black spots, are very different from those laid by any other bird which nests here, they are not always true to type, and in rare cases may be marked with brown instead of black, or even be plain blue altogether.

The thrush and robin are the two birds most likely to be found breeding early in the year, but, generally speaking, it is not of much use to look for eggs till March, and the great months for eggs are April, May, and June. After that, although many birds breed a second or even a third time in the year, the supply of eggs rapidly falls off.

Before setting out to search for eggs one should find out which birds are protected by law, and the particular regulations applying in the locality.

It is a mistake to think that one will always find the nests in the most out-of-the-way places; birds often nest in a frequented spot, and in a wood, for instance, the nests are more likely to be found along the pathways than right in the depths of the thicket. Birds which build in holes are often careless of observation, and less inclined to secrecy than those which build among the boughs and twigs.

Birds which build high up are also less secretive than those which build low down, and the hardest of all nests to find are those of birds which nest on the ground.

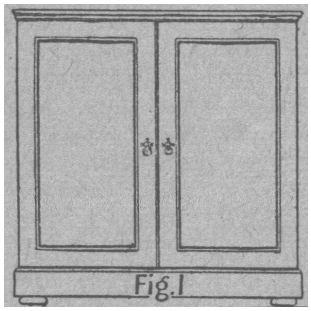
In searching for nests which require climbing to reach them, it is always best for two people to go together. Assistance may be required, and someone will thus be at hand in case of an accident. The eggs of many cliff-building sea birds, indeed, are not to be got by any ordinary amateur, and must be obtained from men who make it their special business to collect them.

BIRDS' EGGS: A CABINET FOR COLLECTORS

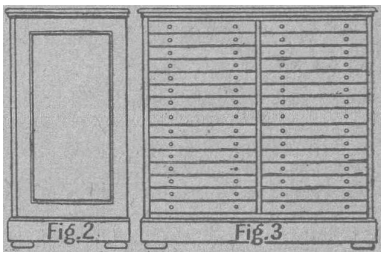
How to Make a Compact Set of Airtight Drawers

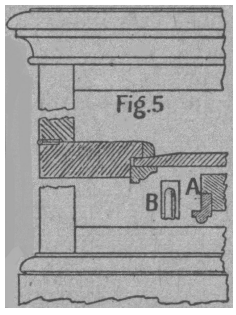
The woodworking enthusiast who is also a naturalist will readily adapt this design to other collections, such as Butterflies. Information about similar hobbies will be found under Flowers; Shells, etc.

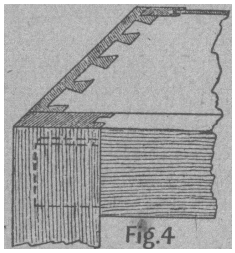
The cabinet shown in the diagrams in this and the next page measures 3 ft. ½ in. wide by 1 ft. 6½ in deep over the carcass. The total height is 3 ft. 2 in. There are 30 drawers. The cabinet is adaptable, with little alteration, to the needs of the collector of butterflies or other natural history objects.

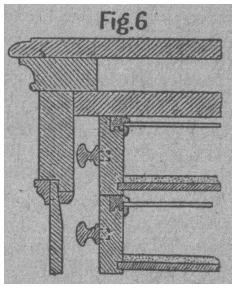


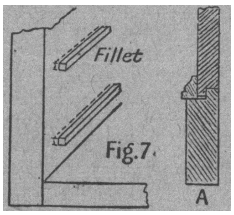
Birds' Egg Cabinet. Figs. 1-7. Front and end elevation and sectional and other details of construct-ion.











The cabinet is of solid mahogany throughout, with veneered door panels and end panels. For the drawers, which call for most careful and exact workmanship, a perfectly sound and well-seasoned hardwood is essential. The cabinet has no ornamental features. The top is moulded and the ends (like the doors) are panelled. In Figs. 1 and 2 are shown respectively the front and end elevation, whilst 3 shows a front view with the doors removed.

The carcass consists of two ⅞ in. framed ends (for section see Fig. 7, A), to which the ⅝ in. carcass top and bottom are dovetailed (Fig. 4). The ends are rebated to take the framed back. The ¾ in. central

gable is fixed by grooving to the top and bottom. Half-way up are the stiffening shelves (solid shelves, not merely rails), ⅜ in. or ½ in. thick, grooved to the middle and end gables. In each case the grooves will be stopped back a little from the front to mask the joints.

The top is shown in Fig. 5 and 6. It is 1⅜ in. deep, made up of a solid ½ in. top and a moulded and mitred ⅞ in. by 2 in. slip below.

The base is dovetailed together, and faced up with ¼ in. lengths. Stout angle blocks are glued and screwed on to take circular toes 3½ in. in diameter by in. thick, which are screwed on from below. The base mould is shown in Fig. 5.

The doors are framed up of 2⅝ in. by ⅞ in. stiles and rails, sections being shown at Figs. 5 and 6. The panels are 5/16 in., and it will be seen that the doors open right over the gables, so that access to the drawers is easy. The rails are shouldered and tenoned as indicated by dotted lines at Fig. 4. The astragal is shown at A and B, Fig. 5. Note should be taken of the section at A, and also of the detail at B, which indicates the stopped bead at the ends. The ends of the cabinet are framed and panelled to appear like the doors. As, however, the inside faces have to be fitted with narrow fillets on which the drawers run, the panels are flush with the stiles and rails at the back, as Fig. 7, A.

At Fig. 7 is also shown a sketch of the fillets. A reference to Figs. 8 and 10 will show that grooves are run in the drawer sides to engage on the fillets, and as the comfort of using such a cabinet depends largely on the easy running of the drawers, there must be absolute accuracy in the fixing of these fillets.

Their positions should be accurately marked, and, for preference, shallow grooves should be run in the gables to receive them. In the case of the present cabinet the drawer grooves are 3/16 in. by 3/16 in., and thus the fillets will project 3/16 in. by 3/16 in. to engage with the grooves. If bedded in the gables they may be cut 5/16 in. wide by 3/16 in. deep. Of course, fillets are fixed to both faces of the central gable as well as to the ends, and all are stopped back about 1¼ in. to correspond with the drawer grooves.

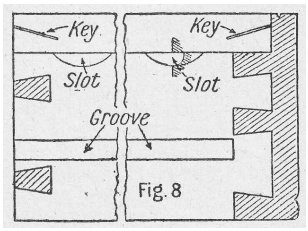
The back is framed in the manner indicated at Fig. 4. The necessary brass fittings consist of two pairs of strong brass butts, two flush bolts for left-hand door, lock, and two drop handles.

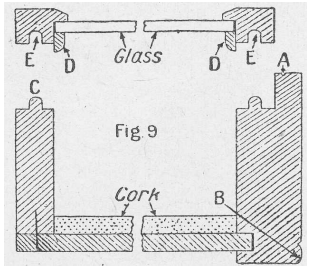
The drawers are so constructed as to be virtually airtight. Everything depends first, on accuracy in setting out, and secondly, on exactness in construction. The drawers are 17 in. wide, 16 in. from front to back (not including knobs), and 2 in. deep outside. A part side view is given in Fig. 8, sections in Figs. 9 and 10, a part top view in Fig. 11, and details of the disinfectant reservoir in Fig. 12. The drawer in reality is a box with a framed lift-up glass top. There is no space between the drawers. There is a scratched bead, which will be seen in the sections, Figs. 8 and 9. The drawers, by means of their side grooves, run on the fillets already described, and the lift-up glass tops are hidden by the fronts when the drawers are shut. The details and sections here given are drawn half size.

The drawer fronts (Fig. 9) are 17 in long, 2 in. deep, and ⅝ in. thick. On the top, at A, a tiny V-groove is run, and at B there is a flat bead, both of these features being simply finishing touches. If Fig. 8 is examined in conjunction with Fig. 9, it will be observed that the lift-up top comes flush with the top of the drawer front.

How the Cabinet is Kept Airtight

The inside of the front is rebated to receive the top, a rounded fillet, C, being carefully worked right along to engage with a corresponding groove, E. run in the top frame. These rounded fillets keep the top practically airtight when on, and must be neatly mitred at the orners. About ⅛ in. from the lower end a groove is run to take the 3/16 in. bottom of drawer. The fronts are dovetailed to the sides as in Fig. 8. The drawer sides are shown here as if ⅜ in. thick, but, in the actual cabinet under consideration they are only 5/16 in. They are slightly narrower in width than the fronts, as the top comes right down upon them. Fig. 10 shows a section through the sides. The top edge is finished with a rounded bead exactly similar to that on the front; in this case, however, it is easier to work as there is no rebate.

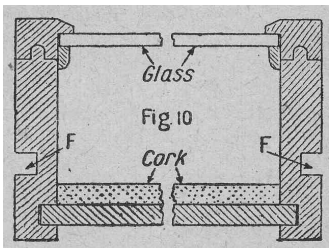




Birds' Egg Cabinet.

Fig. 8. Part of drawer side.
Fig. 9. Section of drawer showing air-excluding lift-up top.

The groove by means of which the drawer slides is shown at F in the section, Fig. 10. The groove, which may be 3/16 in. wide by 3/16 in. deep, runs to the back of the drawer, but is stopped ⅝ in. from the front. The greatest care must be taken to set out these grooves accurately, and to cut them clean and sharp. The slightest error will cause the drawer to stick, and if force is required to open or close it the gable fillets will soon wear. Like the front, the sides will be grooved in order to take the drawer bottom. Two thumb-slots (shown in Fig. 8) are worked to the top edge of each side, so that pressure with the finger may be exercised on the lift-up lid to remove it. A section is shown. The back is shown in s ection in Fig. 9. It also may be ⅜ in. thick, with rounded fillet, C. It is dove-tailed to the sides as indicated in Fig. 8. The bottom may be 3/16 in. thick, of sound wood. It is slid from the back into the grooves cut in sides and front to receive it. To the back it is firmly bradded to prevent its working loose.



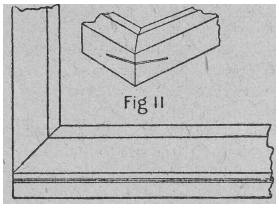


Fig. 10. Section through drawer side. Fig. 11. Part of lift-up top, with detail of corner. All half scale.

In Fig. 3 the two middle drawers are shown slightly deeper than the others. The actual drawers are no deeper, but the front is taken down half an inch to hide the edge of the stiffening shelf, which is set back about ¼ in. from the front edge of the gable-ends and centre partion.

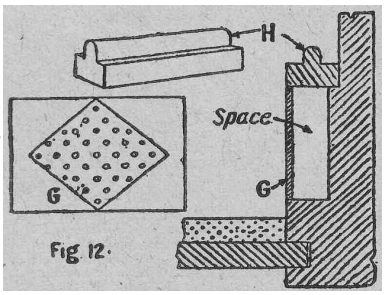


Fig. 12. Details of the disinfectant reservoir which is placed in the front side of drawer.

All drawers, with their lids, should be numbered, so that each may be kept in its proper place. Preferably, the numbers of the drawers should be stamped on the top edge of drawer front and on the under front edge of lid frame.

The lift-up top is a frame which fits closely on the drawer. It is shown (in section) separately in Fig. 9 and in position in Fig. 10. It engages in three distinct ways: first, the front edge of frame fits into the rebate cut in the drawer front; secondly, the groove, E, fits on the rounded fillet, C; and thirdly, the projecting bead, D, fits exactly within the four sides of the drawer.

The frame sides are only ½ in. wide by ⅜ in. thick. Thus the wood used must be in perfect condition. The inner top edge is slightly chamfered, and the lower edge is run with a U-shaped groove, E, to fit the rounded fillet, C, formed on the drawer sides, front and back. A rebate is cut to receive a pane of medium heavy sheet glass, and the frame is mitred at the corners and keyed as shown in the inset sketch at Fig. 11. (The mitre key is also shown in Fig. 8.) The glass, which must fit closely, is held by a fine bead, D, which projects as shown to fit inside the drawer. This bead must be securely glued in.

BIRTH. The birth of every child, whether born alive or still-born, must be registered at the local registry within 42 days in England and 21 days in Scotland. A child must be registered by the father (if the child is legitimate) or the mother; failing them by the occupier of the house where the child is born, or by any person present at the birth. The father may register an illegitimate child- and give it his own name. The cost of a birth certificate is 2s 6d. In the case of a foundling information must be given to the registrar. The name may be altered within 12 months (Scotland, 6 months) of the registration. *See* Baby, Childbirth.

BIRTHDAY. Most people think that a person born on the 30th of June, 1900, would come of age on the 30th of June, 1921. The person in question comes of age on the 29th of June, 1921, because that is the day on which he actually completes 21 years. And as the law takes no notice, as a rule, of fractions of a day, it does not matter at what hour on the 30th of June, 1900, he was born. He is 21 and of full age at the very first moment of the 29th of June, 1921.

BIRTHMARK. Angiomata, naevi, or port wine marks are masses of dilated blood-vessels slightly raised on the skin, scalp, lips, etc. Moles may be flat, but are usually somewhat raised above the skin. Common sites are at the side of the nose or on the cheek on the line between the angle of the mouth and the opening of the ear.

The treatment is best left to a doctor, as some of the conditions require excision, liquid air, or electrolysis, while others are treated by radium and carbonic acid snow. It is never safe to irritate moles by the use of caustics or otherwise.

BISCUIT: How to Make at Home. All flat bread that is baked until it is crisp may be called biscuit, but as a rule the word is used for the two principal sorts, referred to as soft and hard biscuits. The soft variety is easier to make at home. To ensure crispness the dough should be thin. It is difficult to keep it of equal thickness, so have two strips made of hardwood that does not readily warp—say, mahogany—and when the rolling of the sheet of dough is nearly finished, the two strips of wood are placed one on each side of the sheet, and near enough together to support the ends of the rolling-pin. The pieces of wood are made of a thickness the biscuits are intended to be—about 1/6-1/8 in. The whole sheet is then easily kept of one thickness, and the biscuits are not so readily burned.

Rich biscuits need no aerating agents; they are made short with butter or other fat, and bound together with eggs. Those with less shortening, and made into dough with milk, have usually chemical aerating agents mixed with the flour, or self-raising flour may be used. Biscuits should be baked on a shelf near the top of the oven, so that they may colour.

A rolling-pin about 1½ in. in diameter, 16 in. long, and the same thickness throughout, is better than the ordinary kitchen roller with handles. A variety of cutters can be made from oval and oblong mustard and other tins; all that is necessary is to pierce a hole in the bottom to let in air. A soft broad brush (should be kept for washing over with a glaze of egg added to twice its volume of milk. A fork serves for pricking, or a little docker, with the spikes equidistant.

Wholemeal Biscuits. Into 1¼ lb. medium fine wholemeal mix, ¼ oz. bicarbonate of soda and ½ oz. cream of tartar. Rub into this 4 oz. good margarine, or half margarine and half butter. The meal is then placed in a basin, and at once mixed into dough with about ½ pint milk, in which 4 oz. sugar has been dissolved. The dough should be stiff and yet easy to handle. Turn on to a board dusted with meal, and roll out in sheets 1/6 in. thick. Use only a small piece of dough each time. The baking-sheets require no grease, nor do the biscuits need pricking. They bake in a hot oven in about 12 min. and if cooked should feel hard when pressed.

By using half the amount of flour, ¾ lb. medium oatmeal, and more milk, oatmeal biscuits could be made from the same recipe.

Short Biscuits. Sift ½ lb. flour — all ordinary flour or half ground rice or cornflour— and rub into it 4 oz. butter or margarine. Mix in 2 oz. white sugar, turn out the whole on a floured board, and mould to a paste. When well worked together so that it does not crumble, roll out thinly and cut into fancy shapes. Put a piece of almond, angelica, cherry or candied peel on the top, and bake in a slow oven until lightly browned. Do not attempt to remove from tin until cold.

BISCUIT WARE. The term denotes pottery which has been fired without or before being glazed. It includes unglazed stoneware, black Egyptian, terra-cotta, and Wedgwood jasper. China collectors prize certain famous and beautiful biscuit groups made at Sèvres, as well as those modelled in the Derby factory especially between 1790 and 1810.

These figures, which have the feel of new clay tobacco-pipes, sometimes with a slight translucent glaze, include groups suggested by Angelica Kauffmann's drawings, rustic figures and scenes, Derby medallion portraits of British generals and admirals, besides small round or oval plaques of Bristol make. After the best period the secret of making biscuit ware was lost, and a long interval intervened before Parian ware took its place.

Pieces ought to be dusted with clean cloths, and washed in clean water, otherwise the unglazed surface may become smeared or discoloured. *See* China.

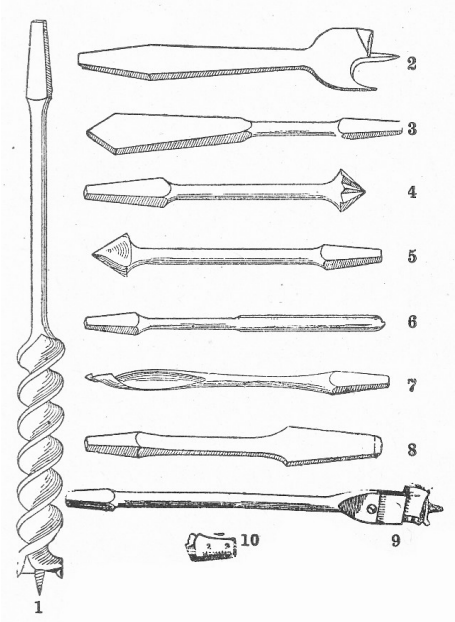
BISMUTH. The various compounds of bismuth have an antiseptic, astringent, and sedative action. Those most commonly used in medicine are bismuth oxide, bismuth car-bonate, bismuth subnitrate, bismuth salicylate, the dose of each being 5-20 grains; the liquor of bismuth, dose ½-l dram; and the compound bismuth lozenges. All these are used in irritable and inflamed states of the stomach and bowels, and relieve the pain, vomiting, and diarrhoea.

Bismuth carbonate is perhaps the best of the preparations, as it relieves acidity. For indigestion, a useful combination is bismuth carbonate, grains 10; magnesium carbonate, grains 20; and bicarbonate of soda, grains 20. This can be taken in milk or in soda-water, three times a day, half an hour after meals.

BISQUE SOUP. A shredded onion and a piece of cucumber are fried in a tablespoonful of butter and added to a quart of fish stock, the whole being seasoned with salt and pepper and cooked until the vegetables are tender. Then the yolks of two eggs are beaten into ¼ pint cream and added. The soup should not be allowed to boil, but stirred thoroughly until it thickens, when it is ready to serve flavoured with anchovy sauce. *See* Soup.

BIT: For Driving. A bit is the mouthpiece of a bridle carried by the horse in its mouth so that the driver may cause it to obey his will. It is usually of metal, and both the cheek straps and the reins are attached to it. A curb bit has a curb chain instead of a bar, and gives the driver a strong leverage by enabling him to compress the horse's mouth. A snaffle bit is joined in the centre, and is usually provided with check pieces so that the reins may not go into the horse's mouth. *See* Driving; Harness; Reins.

BIT: For Wood and Metal. Small steel cutting tools or bits are used for boring wood or metal; they are rotated by means of the brace or stock, into which their square-tapered ends are fitted. Of many patterns designed to suit all kinds of boring work the most useful are the following:



Bit. Figs. 1-8. Bits of patterns in common use. Figs. 9 and 10. Expansion bit and extra routing cutter for obtaining large diameters.

Auger bits, Fig. 1, for deep boring, are made with a long shank, a twist, and a head. The latter has two spurs which define the size of the hole, two cutters which remove the wood and place it so that the twist draws it up, and a screw which draws the bit into the wood. Sizes range from 3/16 to 1¼ in.

Centre bits, Fig. 2, for shallow boring are made with a central prong, a spur and a cutter which acts as a lifter or lip to carry off the shaving. They are made from ¼ in. to 1½ in. in diameter.

Countersink bits are employed for boring conical depressions to allow screw-heads to be turned in flush. There are three kinds in ordinary use. The flat bit, Fig. 3, having two inclined edges ground to opposite angles, is mainly used for iron and for enlarging the holes in hinges, etc. The rosehead bit, Fig. 4, is for brass, but is useful for hardwood; it has a conical head with edges which may be sharpened on a stone. The snail-head, Fig. 5, for soft woods, is conical, with one side cutter.

Nose bits, Fig. 6, are for end grain; they are hollow in the shank, with a centreing projection at the point, and range from ¼ in. to ½ in. in diameter. Shell bits are similar in shape, but have a plain rounded end. They are handy for cross-grain boring where deep holes are required. Spoon bits, also similar in form, have a pointed end.

Twist or gimlet bits, Fig. 7, are for hardwoods; they have a gimlet point and are cut on the curved sides of the shank. They are difficult to sharpen. Sizes range from 1/32 in. to ⅜ in.

Turnscrew or screwdriver bits, Fig. 8, are used in those cases where a large number of screws have to be driven.

Expansive or expanding bits are intended for boring shallow holes up to about 3 in. in diameter. They have a fixed screw-head and an adjustable spur and cutter. In Figs. 9 and 10 are shown Clarke's patent expansion bit and the extra routing cutter for obtaining large diameters.

A type of bit having practically no centre point is Forstner's auger bit, a splendid tool for boring away the groundwork for carved panels, etc. Bits should be kept either in a wooden stand, with the shanks fitting in a tapered hole, or in a canvas or baize roll. Soldering bits are described under the heading soldering. *See* Brace; Drill; Soldering.

BITE: Of an Animal. A bite is likely to produce a poisoned wound, or, at any rate, should always be treated as such. Bleeding should be encouraged for a short time, unless it is too free, and the wound should be washed out with an antiseptic lotion, such as saturated solution of boracic acid, carbolic acid lotion (1 in 60), or a solution of permanganate of potash. If the bite is a severe one, as by a horse, the treatment will have to include that for shock— warmth and stimulants, hot coffee, spirits in water, or a teaspoonful of sal volatile in water.

In the case of a dog bite a ligature should be fastened on the limb (if the bite occurs on one), and this is done by tying a handkerchief round the limb, passing a piece of stick through it, and twisting the ligature tight. This can be left on for half an hour if necessary. Immediately the ligature is applied, or at once in bites on other parts, the wound should be sucked. There is no risk in doing this if the lips and mouth are free from abrasions. The mouth should be rinsed out with water or spirits after the operation is completed. A piece of boracic lint or a clean rag wrung out of boracic or carbolic solution is then applied. The doctor will have been sent for, of course, and may decide on further measures. The anxiety in dog bite is whether or not the animal is suffering from hydrophobia, though, of course, one may be bitten by other animals or even by human beings suffering from hydrophobia. Therefore the dog should not be destroyed until sufficient observation of its condition can be made.

In Great Britain the only snake whose bite need be considered is the adder or viper, and the bite is rarely dangerous except in the case of children and debilitated persons.

Where insect bites or stings have occurred the sting or stings should be searched for and treatment applied as given under Bee Sting. *See* Adder Bite; Bee Sting; Frost-bite; Hydrophobia; Sting.

BITTER ALMOND. The skins are rough and indigestible, so they should always be removed by blanching. Bitter almonds contain a substance called amygdalin, one element of which is prussic acid. Therefore, though useful for pounding with sweet almonds, or as a flavouring, they should be used in moderation. *See* Almond.

Bitter Apple. *See* Colocynth.

BITTER PIT. The name is given to a disease of ripening apples, apparently not caused directly by fungus or insects, but physiological and due to some weakness in the tree. It is so named from depressions in the skin of the fruit, which correspond with brown spots in the underlying flesh. The tissues of the apple are stored with starch, which during the ripening process is changed into sugar. In fruit suffering from bitter pit it is found that the starch of the brown spots remains unchanged and bitter to the taste, whilst the surrounding white flesh has become sugary. At present no cure is indicated, but the trouble is less likely to occur if the trees are lightly pruned and planted in well cultivated and adequately drained land. *See* Apple.

BITTERS. Various kinds of bitters, including Angostura, Khoosh, orange, and peach, are made by cordial compounders, and taken with sherry, gin, etc., as an appetiser. Bitters can also be made at home. One recipe requires a bottle of orange wine, a quartern of proof spirit, and 2 oz. of bitter orange peel. The latter should be steeped in the spirits for a week or 10 days, and then run off. The spirits are then mixed with the wine, and the bitters are made.

BLACK: The Dye. There is not one black, but many, and dyers of fabrics are able to offer several

shades of black, more or less blue, full or reddish.

Comparison of blacks should be made not merely by looking downwards at the samples but by holding the patterns up to the light at eye-level, when the difference of tone is much more apparent. Blacks of the same shade look different when they are dyed upon a shiny or a matt surface.

There should be no difficulty in obtaining permanent blacks, such as will not turn rusty in wear. On cottons the fastest black is an aniline dye.

Linen dyes black with difficulty, but silks, natural and artificial, are satisfactory. Professional garment dyers have the means of making a better job than can be turned out at home, but faded blacks can be improved by re-dyeing with home dyes.

BLACK-AND-TAN. This neat-looking, short-coated terrier, also known as the Manchester terrier, is a good house-dog. Quiet and alert, he is always ready for a romp with the children. He is, moreover, a good ratter.



Black-and-tan Terrier. Specimen of the miniature variety of this short-coated breed of dog.

The head is long and wedge-shaped, with tapering jaws, small bright eyes and a black nose. Jet-black is the predominant colour, picked out sharply here and there with rich tan. The muzzle, lower jaw and throat, a spot on each cheek and over each eye should be tan; so should the front legs below the knees, but the hind legs should have tan on their inner side only. The same colour marks the under side of the tail, the vent, and there is a touch of it on each side of the chest. The weight varies from 10 lb. to 20 lb., but there is also a toy race which does not exceed 7 lb. *See* Dog ; Terrier.

Black Beetle. This is an incorrect name commonly applied to the cockroach, which is not a beetle. *See* Cockroach.

BLACKBERRY. The cultivated varieties of blackberry are rarely superior to the best of the wild brambles in flavour, but they produce much larger fruit, ripening in September and October. The parsley-leaved blackberry is one of the best for gardens. The best of the newer ones are Edward Langley, Pollards, Best of All, and Himalayan Giant. All flourish in ordinary soil that has been dug and manured. The latest novelty is a white blackberry which was found growing wild in Bedfordshire and is available for cultivation in gardens.

Blackberries are readily propagated by pegging down the tops of canes, for roots are thrown out freely, and when they are abundant the tips can be cut away and the parent liberated. They succeed on arches, trellises and frameworks of stout stakes.

The principal difficulty is to get the plants established, and severe pruning is required. It should begin with the planting, and consists in cutting whatever canes the plants may be carrying close to the ground. The canes will bear a large number of strong laterals if they are stopped when they have grown to about half their normal height, say, 3 ft. The laterals may be pinched at the foot. This treatment dwarfs the plants, which may be convenient in some gardens, and as a rule it gives very good crops of fruit. After the first year pruning is done as soon as the fruits are gathered by cutting out the old canes. *See* Apple; Bottling.

BLACKBERRY AND APPLE JELLY.

Stalk and examine 4 lb. ripe blackberries and turn them into the preserving pan with 1½ lb. of apples, washed and cut in slices, but not peeled and cored.

Then pour into the pan ½ pint water and the juice of one lemon. Boil until the apples are soft, then strain off the juice through a jelly bag. Rinse out the pan, measure the juice back into it, and add 1 lb. white sugar to every pint of juice. Boil it steadily until it will jelly firmly when tested on a plate. Pour the liquid into dry, warmed jars and tie them down at once. Should the blackberries be poor and what is termed bullety, use double the amount of apples and only ¾ lb. sugar to each pint of juice. *See* Apple.

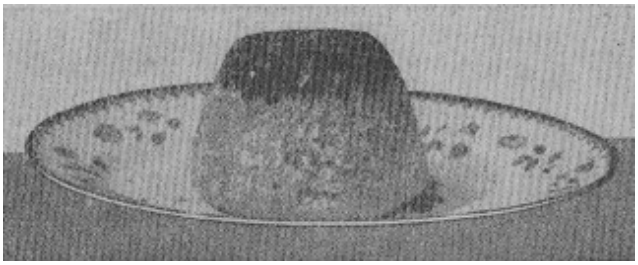
BLACKBERRY AND APPLE PIE. For every pound of blackberries used to make this covered tart take ½ lb. apples, 3 tablespoonfuls sugar, and a breakfastcupful water. Fill a pie-dish with the fruit and sugar in layers, taking care that the fruit is on the top. An inverted egg-cup should be stood in the centre. Then pour in the water and cover the dish with a short crust. Bake the pie in a moderate oven for about ¾ hour. One lb. blackberries will be enough for 4-6 persons.

BLACKBERRY CREAM. Put 1 lb. of blackberries in a saucepan with ¼ lb. sugar, the thinly peeled rind of a lemon, and 2 or 3 apples peeled and sliced. Stew slowly until the fruit is soft, stirring frequently; then rub the mixture through a hair sieve. Dissolve ¾ oz. gelatine in 2 tablespoonfuls of water, and strain it into the juice. When the latter is lukewarm, stir in ½ pint of whipped cream, and pour it into a wet mould. When the mixture has been allowed to set in a cool place, it can be served with jelly.

BLACKBERRY JAM. Although it is often made without apple, even a little of the latter is an improvement to blackberry jam. Peel, core and slice 1½ lb. of apples, and put them in the preserving-pan with a gill of water and 4 lb. of white sugar. Stew the apples until soft, stirring frequently with a wooden spoon, and adding more water, if necessary.

When soft, add 4 lb. of stalked blackberries, and boil steadily until some of the jam sets when tested. Remove scum during the boiling. Turn out jam when finished into dry, heated jars, and tie them down at once. See Apple; Jam.

BLACK CAP PUDDING. One beaten-up egg to ¼ lb. of flour and a pinch of salt is the proportion for the batter, half a pint of milk being added to bring it to the right consistency. The batter is heated and stirred. A mould having been thickly greased, 1 oz. of cleaned currants are sprinkled into it, then the batter is poured in and the mould covered with greased paper and allowed to steam for an hour and a half. *See* Batter.



Black Cap Pudding. A wholesome steamed batter capped with currants.

BLACKCOCK. This game bird, in season from the middle of August to the end of November, is usually roasted and is excellent and economical. The female bird is known as grey hen. They should be hung and kept for a few days after shooting. After plucking and cleaning the bird, wipe it inside and out with a damp cloth; washing spoils the flavour. It should be trussed as a chicken. Roast for about an hour in a moderate oven, basting it frequently. Dish on a slice of buttered toast with bread sauce, gravy and fried breadcrumbs served separately. *See* Game.

BLACK CURRANT. Of all currants the black are the richest in flavour. They have none of the extreme acidity of the red, but have a rich almost vinous taste. The plants thrive best in heavy, retentive soil, and are most healthy and productive when throwing up an abundance of suckers from the base. Whatever the soil, large pieces of young wood may be selected for cuttings, and planted for most of their depth, 5 to 6 ft. apart, in autumn, with all their buds left on. Thev should become profitable in their third year and be at their best in the seventh year from the insertion of the cutting.

The rooted cutting is shortened to about 9 in. at the end of the next season's growth in order to increase the number of main branches. No summer pruning is needed, and the winter pruning merely consists in cutting out parts of the old branches in order to make room for young ones. The young wood that is produced from the plant in one season bears fruit the next.

Currant Diseases. One of the most serious is that termed nettlehead, or reversion. The bushes may revert by degrees. The leaves become elongated and narrow, assuming the nettlehead form; there is change in the flowers, and fruit production almost entirely ceases. May and June are the best months to detect the disease, which can only be done by carefully inspecting the bushes.

Methods are recommended for dealing with reversion in Leaflet No. 277 of the Ministry of Agriculture. The plantation should be examined systematically, if possible twice a year, at blossoming time and again in May or June. Reverted bushes should be marked, and after the crop has been gathered they should be grubbed up and burnt. Care should be taken to propagate only from sound stock. Since the disease is conveyed by the big bud mite, keeping down this pest will reduce the incidence of the reversion disease. The surest method of detecting reversion is to count the veins running from each side of the midrib in the terminal lobe of the leaf; if there are fewer than five veins, reversion may be suspected. *See* Big Bud; Bottling; Magpie Moth; Red Currant; White Currant.

BLACK CURRANT GIN. Made from 1 quart of black currants, 1½ lb. of Demerara sugar, and 1½ quarts of gin. All that is necessary is to put these ingredients into a stone jar and shake them occasionally. This drink improves with keeping.

BLACK CURRANT JAM. A little less than a pound of sugar is sufficient for 1 lb. of black currants, it should be added to the fruit in the preserving-pan, and the whole allowed to stand for some time. Then the sugar and fruit are brought slowly to the boil, being thoroughly stirred so that they do not stick to the pan. About 35 minutes' boiling should be sufficient, but the only safe test is to place a little in a saucer and stand it at an open window to see whether it will jelly when cold. The covering of the jam should be done whilst it is quite hot. *See* Jam.

BLACK CURRANT JELLY. Simmer the currants in an earthenware jar placed in boiling water until all juice is extracted and then strain through muslin. With a pound of sugar to each pint, the juice is boiled until it sets firmly when dropped on a plate. It is then poured into jars and covered at once.

Black Currant Mite. This is the name of the insect which causes the disease known as Big Bud (q.v.).

BLACK CURRANT PUDDING. The ingredients are: ½ lb. of flour, 5 oz of suet, 1½ lb. of black currants and 2 tablespoonfuls of brown sugar. The suet is chopped and mixed with the flour, which is then made with water into a soft but not sticky paste. A quarter of the suet crust should be now cut off and put aside for the top of the pudding, the remainder being rolled out about ½ in. thick on a floured board. Line a greased pudding basin with this pastry, then put in the currants, with the sugar and about a gill and a half of water. The small piece of pastry for the top is rolled out and pressed on to the basin (a little water being used to make the two edges adhere) and then covered with greased paper. A floured pudding cloth is tied over top of basin and the pudding boiled in fast-boiling water for about 2½ hours. It should be served with cream. This will be sufficient for 4-6 persons.

BLACK DOLPHIN. Collier, black fly and black dolphin are names applied by gardeners to the aphis that settles on the terminal shoot of broad beans. Similar in form and habits to the aphis that troubles the rose-grower, the black dolphin is rendered distinct by its sooty hue, delicate pale legs and antennae, and a long fine beak which is thrust into the cuticle of the plant whose juices are sucked through it. It exists through the winter in the egg-stage on some perennial weed such as dock. The eggs hatch in April, and the wingless young colliers settle upon the new vegetation. These are nearly all females, which produce living young, and the multiplication of these pests goes on indefinitely.

As soon as the pest appears the tops of all affected bean plants should be nipped off, dropped into a tin and emptied on the kitchen fire. Where this course is not possible owing to their having been allowed to spread, the plants should be syringed with an insecticide or with strong soap-suds free from soda, washing off the soap with clean water within twelve hours. Broad beans which are sown in November suffer much less damage from this pest than spring-sown plants.

BLACK DRAUGHT. This name is given to a strong aperient containing Epsom salts, liquorice, spirit of sal volatile, and senna. The usual dose is 1½ oz. taken early in the morning. The previous evening a blue pill (5 grains) is taken, the combination being a common remedy for such ailments as congestion of the liver or biliousness.

BLACK EYE. This is an effusion of blood under the loose skin over and around the lids. It is due to a blow. As the tissues beneath the skin in this region are very lax, considerable subcutaneous bleeding takes place, and this accounts for the discoloration, which at first is dark purple and then passes through brown and green to yellow. Apply cold compresses made of folded flannel or lint, sufficient to cover the area, wrung out of iced water, and applied as continuously as possible for a few hours. An older remedy is the application of a piece of raw beef.

When swelling has subsided the removal of the discoloration can be hastened by compresses soaked in spirit lotion, methylated spirit, one teaspoonful, water up to two tablespoonfuls, and covered over by gutta-percha tissue, the whole being held in position by a bandage. Several times a day a little vaseline should be smeared over the eyelids, which are then gently massaged. *See* Eye.

BLACKHEAD: How to Cure. Blackhead or comedo is a little white or yellowish elevation of the skin with a black centre and is often associated with common acne, which is a chronic skin disease characterised by pimples, blotches, blackheads, and a greasy skin on the chin, forehead, shoulders, and back. It is commonest in young people at the change from childhood to adult life. The hard pimples with little black dots in their centre are the tiny skin glands which have become choked with secretion which has undergone degeneration Later these little red mounds become pustular and discharge. New crops of pimples and blackheads succeed each other, the affection often persisting for years.

The parts affected should be washed thoroughly night and morning with soap and warm water. After this, mop the parts for five minutes with water as hot as can be borne. Then press out with the finger-nail, guarded by a thin silk handkerchief, or with a comedo-extractor (which any chemist can supply), as many of the blackheads as possible. At bedtime apply the following lotion with a little cotton-wool, and allow it to remain on all night:

Precipitated sulphur	1 part
Rose water	24 parts
Lime water	24 „

If this causes irritation apply cold cream until irritation disappears and then use an ointment of salicylic acid, sulphur (10 grains each) and zinc oxide (60 grains) with soft paraffin (to make 1 oz.), resuming the lotion later.

The diet should be very plain with ample fresh and stewed fruits and green salads. Fatty foods, pastry and sweets should be avoided. An excellent aid to clearing the skin is to drink 8 glasses of water, two at a time, between meals.

Where the pimples tend to become full of matter, ¼ grain doses of sulphide of calcium taken four times a day often have a drying-up effect on the spots.

For the anaemia and constipation so frequently noted in acne the following prescription is recommended:

Sulphate of iron	16 grains
Sulphate of magnesium	1 ounce
Dilute sulphuric acid	1 teaspfl.
Peppermint water (enough to make)	4 ounces

Take a tablespoonful of the above prescription in a wineglassful of water, at least half an hour before taking breakfast.

BLACKING. For preserving and polishing black leather boots, various dressings mostly depend upon the use in their manufacture of a form of charcoal made from bones, known as ivory black or bone black. The first recipe makes a liquid blacking.

Mix 8 oz. of ivory black with 1 oz. of sperm oil so that a smooth paste results, then add 6 oz. treacle mixed with an equal quantity of good malt vinegar. Stir these well together, and add gradually 1 oz. (by weight) sulphuric acid. Effervescence and heat result, and when the effervescence has subsided, add 16 oz. vinegar, and bottle the blacking whilst still warm.

For use on calf leather boots, the recipe of a polish which is waterproof is:

Carnauba wax, 10 oz.; beeswax, 3 oz.; stearin, 1

oz.; shredded and melted together in a tin saucepan. When melted, remove from the fire and add spirit of turpentine, 45 oz.; with which aniline black, ½ oz., and ivory black, 2 oz., have been previously mixed. The paste should then be made smooth by rubbing in a mortar.

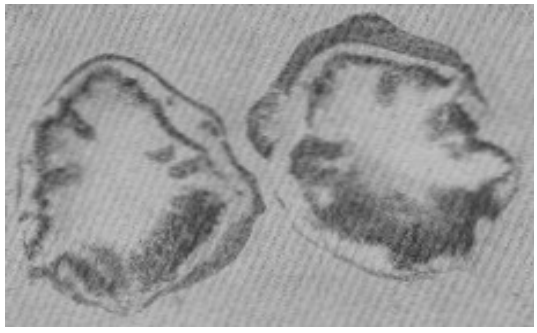
If the paste is required for brown leather boots, phosphine and bismarck brown, 2 dr. of each, are added in place of the aniline black and ivory black.

Boot varnish is made as follows, and applied with a small sponge:

Dissolve 20 dr. blue-black aniline dye and 31 dr. bismarck brown aniline dye in a gallon spirit to form the "mother-liquid dye." Then mix 2 pt. of this with 1 gall, spirit, and camphor, 11 oz., Venice turpentine, 16 oz., shellac, 36 oz.; finally adding 2 pt. benzine with which has been mixed 3 oz. castor oil and 1½ oz. linseed oil. *See* Boot.

BLACK JAPAN. A compound of asphalt, boiled oil, and turpentine is usecl as a varnish for metals under the name of black Japan. Brunswick black is a similar article; when imparting a dull surface it goes by the name of Berlin black.

BLACK ROT. Nearly all the cultivated plants belonging to the cabbage family are liable to be attacked by this disease. In Britain it is most frequent in kale, cabbage, and cauliflower. A characteristic feature is the appearance of dark or blackened veins in the foliage, which turns pale or yellow, the veins sometimes standing out so clearly as to appear like a black network. When the affected leaves and stalks are cut across, the veins or vascular bundles appear as dark points, and when the stem is thus examined a characteristic black ring of wood is present.



Black Rot. Its effect on a cabbage stalk, here shown in sections. (By permission of the Ministry of Agriculture)

When young plants are thus attacked they may survive for some considerable time, but remain stunted and unhealthy. In the case of cabbage and cauliflower, no head is formed, and in turnips and radishes the root fails to develop properly. In severe cases all the leaves may fall off and the plant remain merely as a long stem with a few deformed leaves at the apex; in other cases a head which is apparently sound is found to be diseased inside. Plants are attacked at all ages. Infection usually takes place through the parts above ground and generally by way of the leaves. Slugs and caterpillars are carriers of the disease.

Another source of infection is contaminated seed, which may produce infected seedlings. Contaminated manure or soil in which diseased cabbages have been grown is a source of danger. A small amount of infected soil may ruin the bed, and if there is any doubt such soil should either be rejected or sterilised. Diseased plants should always be burned. They should never be buried, thrown on the manure heap, or given to pigs, chickens or other animals. Where the disease has existed no cabbages should be grown on the land for five years. Leaflet 68 issued by the Ministry of Agriculture deals with this disease, and gives information about methods of disinfecting the soil.

BLACK SCAB. This is the name of two diseases, one affecting apples and pears, the other potatoes. The first shows itself in the form of black specks and spots, which spread into large discoloured patches. The fruit, leaves, and twigs may all be affected. In bad cases the fruit cracks. In drier years it is rarely so severe as in wet ones. The best treatment is, in winter, to prune out all diseased and unhealthy-looking shoots, and to spray with Bordeaux mixture (q.v.) or lime-sulphur, just before the flower-buds open, and again as soon as the petals have fallen.

In potatoes black scab (wart disease) appears to be a disease of the tuber only. The first sign is a series of warts in the eyes, which develop into black crinkled masses. The affected tuber rots, and a dark fluid of offensive odour oozes out. The disease may not affect potatoes in store during the winter, but may show itself at the eyes when the sprouts begin to push. Every tuber affected and the haulms should be burnt. No seed from the affected stock should be planted, even if part of the crop appears to be clean.

It is perfectly easy to prevent potatoes being damaged by this disease by planting only varieties which are immune to its attacks, e.g. Witch Hill, Arran Comrade, Abundance, Great Scot, Majestic, and The Bishop. *See* Apple; Pear; Potato.

BLADDER PLUM. The malformation and distortion of the young fruit of the plum-tree, known as bladder plum, is caused by a minute fungus, Ascomyces pruni, which is perennial in the tree affected and in spring spreads into the tissues of the new shoots. The plums attacked are distinguished by their larger size, pointed ends, hollowness, and the skin having a bloom upon it due to the threads of the fungus bursting through; they soon turn yellow and shrivel. It has been suggested that the twigs bearing these bladder plums should be cut well back and destroyed; but it is probable that the fungus runs through most of the tree. *See* Plum.

BLANCHING. Calf's head, calf's foot, sheep's and lamb's trotters, veal and lamb sweetbread and brains are all blanched before cooking. They are first

placed under a tap of running water in order to rid them of blood, and then put in a pan of cold water, and brought slowly to the boil. They are allowed to boil for from 15 to 20 min., with the exception of veal sweetbread and brains, which should only be allowed to boil for 10 min., and lamb's sweetbread, which must not be allowed to boil at all. The water is then drawn off and the meat cooled before cooking.

Celery, artichokes, endives, turnips and small onions which have been kept for some time may be blanched before cooking. They are scalded, and then cooled by steeping in cold water until just warm, when they should be placed on a sieve ready for use. *See* Almond; Calf's Head, etc.

BLANCMANGE. Blend two heaped tablespoonfuls of cornflour with a little cold milk, till it is like smooth, thick cream. Boil the rest of a pint of milk, with a piece of lemon rind to flavour, and add about two tablespoonfuls of sugar, stirring till the sugar is quite dissolved. Remove the lemon and pour the hot, sweetened milk over the cornflour paste, stirring all the time, as in making starch. Put the mixture back in the pan and boil gently for five minutes, still stirring continuously. Then pour into a wetted mould and allow to stand in a cold place for several hours before turning out.



Blancmange. Sweet cornflour blancmange flavoured with orange and coloured with cochineal.

If a few drops of cochineal are stirred in before taking it off the fire, the blancmange will be pink. A little vanilla essence or almond flavouring may be used instead of the lemon. A large tablespoonful of grated chocolate may be added to the above recipe when blending the cornflour and milk, and the blancmange served with whipped cream.

When in season, stewed raspberries yield sufficient juice to make a delicious blancmange. Cook this as for ordinary blancmange, using the syrup of the raspberries as liquid, and serve with whole raspberries.

A more elaborate blancmange is made by pouring the cornflour mixture over several layers of fruit placed in the bottom of a mould. Glace cherries, bananas, and tinned pineapple will make a good foundation. When the mould is half full, add another thick layer of mixed fruit and fill to the top with blancmange. The first layer must be nearly cold before the second is added.

BLANKET. Roughly divided into four types, blankets are of (1) a loose cellular weave, (2) Witney, (3) cloth, and (4) Scotch diagonal twill. The first of these are expensive, loosely woven to admit free passage of air, very light, but of the finest wool to ensure warmth; made in colours and satin bound.

The hairy pile of the Witney blanket is scratched or teased out of the body of the article, and the fabric is weakened to that extent. The better qualities are made with long wool, and the loss can be afforded, but the lowest qualities are less satisfactory, because there is too little foundation left, and the pile comes away in wear and washing. Witney blankets are warm when new, but become in effect cloth blankets when their pile has been lost. Cloth blankets are made of shorter wool and their surface is slightly raised, but not by wire brushes, and their wear is dependent upon quality. There are both all-wool and union blankets, and the best qualities of union (i.e. wool and cotton) are to be preferred to the cheapest all-wool varieties. Scotch blankets are made of strong wool, and wear well.

Blankets are sold per pair, of dimensions which should be stated in inches, and calculated to fit respectively single or double beds. It is advisable to see that a good overlap of half a yard per side is left.

In any blankets it is essentially desirable to have a maximum of warmth to a minimum of weight. The fine wools are warm without being heavy, but are much more expensive than the hairy wools. The finest wools are used for blankets for babies' cots, and there are also camel-hair blankets in colours and satin bound to be obtained in all sizes. Jacquard dyed blankets are not so practical, where colour is liked, as those plainly dyed.

Moth does not attack unwashed new blankets, thanks to the sulphur fumes with which they are bleached. Washed blankets attract moths, as the softness makes them ideal for laying their eggs. When stored it is advisable to wrap each pair separately in newspapers and place in a chest or trunk with a tight-fitting lid.

Washing blankets demands special care, and plenty of water, hot, but not too hot for the hand to bear. When the articles have been wetted through, a mild soap should be added. A good flake soap of guaranteed suitability in washing woollens may be used and dissolved before use. The quantity should be sufficient to produce a quick lather to be poured in and the blankets left to steep before beginning to dolly them or to plunge by hand. Blankets must never be rubbed in washing. When a large part of the dirt has been removed, the blankets should be given a second wash. The water should be wrung out either by hand or by mangle, and the blankets should have two washings in lukewarm water to remove all vestiges of soap.

A yellow tinge may be corrected by adding a little blue to the washing water. They can be whitened a little by prolonged exposure to sunlight, which is also the best way to dry them. In washing blankets the aim is not merely to cleanse, but if possible to improve

them by turning them out in fresh, light, spongy condition, and the method of drying is all-important. The housewife has to use lines or stretch the blanket on the grass, and in either event it is advisable to turn the article about frequently. A sunny day with a good wind should be chosen.

Old blankets are useful for ironing-table pads, or, cut to shape and blanket-stitched, for table underlays to prevent the spoiling of polished table tops by hot dishes. Odd pieces of blanket afford good scouring cloths for washing floors and similar work. *See* Bedding.

Blanket Cloth. A heavy woollen fabric used chiefly for coloured and white sports coats.

BLANQUETTE. A form of veal stew, for which the ingredients are 2 lb. breast of veal, 2 onions, 2 cloves, 2 carrots, a bunch of herbs, salt, pepper, 1 oz. flour, 1 egg, and 1 tablespoonful chopped parsley. The meat must first be freed from skin, fat and gristle and cut into small pieces ¼ in. thick. These are put into a saucepan and as much warm stock or water poured over them as will cover them, generally about a pint, then brought to the boil and skimmed. The onions are peeled and a clove put in each; the carrots are scraped and cut up, and the herbs tied up. All are then put into the pan, seasoned, covered, and allowed to simmer gently for one hour.

Take out pieces of meat and strain gravy. Mix flour with a little cold water, stir into gravy and bring to the boil, stirring all the time. Simmer for five minutes, then cool slightly and add the yolk of an egg well beaten. Put pieces of veal into a small pan, strain gravy over and heat through; on no account let it boil. Pour out on a dish, and garnish with parsley, and the blanquette is ready for the table.

BLAUD'S PILL. A favourite preparation of iron, Blaud's pill is chiefly used in anaemia, especially in those types where there is a great deficiency of haemoglobin, the red colouring matter in the blood. Each five-grain pill contains one grain of carbonate of iron, the dose being one to three pills. To be of use the pills must be freshly made.

BLAZER. An unlined jacket resembling a cardigan with three pockets, but with collar of the step variety, a blazer may be used for ordinary sports wear by boys or girls. Blazers for schools, colleges, and universities have their special colours, as also have those of many clubs.

BLEACHING. The articles calling for treatment are mainly white cottons and linens, sometimes woollens and, less frequently, silk. Cottons and linens are best bought fully bleached. Unbleached cottons and linens are dingy in colour, as the raw material carries with it impurities of a waxy or gummy nature. These discolorations disappear gradually in wear and washing and the article assumes a whiter appearance; the whitening process is assisted by drying the washing in the open air, and preferably in a good breeze. Country and sea air are better than town air for the purpose of this natural bleaching.

It is wrong to boil linens in washing soda, although cottons may be treated in that way to whiten. Soda disintegrates the linen fibre and causes it to come away as short fluff. A good mild soap should be used in washing linen and well rinsed out. If linen is ironed with soap still left in it, or if linen after washing is stored above a hot cylinder, a yellow tinge is caused which may call for bleaching. This colour can generally be removed by careful re-washing with repeated rinsings, followed by open-air bleaching. The article should be spread on the grass and periodically moistened. The continual wetting and drying has much to do with the removal of the colour.

How Cotton Fabrics are Bleached

When cotton is bleached by professional bleachers from its natural colour to a full white it is boiled in clear lime water and washed; treated with weak acid and washed; boiled with caustic soda and washed; steeped from 2 to 4 hours in clear solution of chloride of lime; boiled for 12 hours and washed; left in weak acid again for 3 or 4 hours and washed: finally it is rinsed and blued. To attempt the process at home without the necessary plant would lead to damage to the fabric. If chloride of lime, i.e. bleaching powder, is used at all the solution should be made three days in advance and the mixture should be stirred up or shaken in a large jar repeatedly at intervals. Only the clear liquor must be taken and about 1 lb. of the powder should be used to a gallon of water. The cottons should be fully washed and rinsed before they are put to steep in the bleaching fluid. The action of the bleaching powder is hastened if the cottons are previously rinsed in water acidulated very slightly with sulphuric acid. When taken out it is important to rinse them well in water to which washing soda has been added. They must be well rinsed again and then dried.

Bleaching powder should not be used on woollens. It dissolves wool if left for a sufficient time, and in any case makes it harsh. Necessity to bleach woollens chiefly arises when repeated or careless washings have turned what should be white flannel or white knitted goods to a yellow tone. To whiten these a solution of 1 lb. soap and 3 lb. ammonia to 5 gal. water may be used. The action is slow, and the articles may have to be left some days.

A more expensive method of bleaching is applicable to cottons, linens, woollens, and silks. It involves the use of peroxide of hydrogen. A solution should be made in an earthenware vessel of one part of commercial peroxide of hydrogen to ten parts of water and a few drops of ammonia, sufficient to make the mixture slightly alkaline. The articles should be put to steep wholly under water, or stained portions will result. The vessel should be covered against light, which interferes with the result. After half an hour

o r so, when the articles have been thoroughly penetrated, they should be squeezed semi-dry and hung in a draught to dry. The bleaching takes place while the articles are drying and only if the atmosphere is cool enough. The operation cannot be done if the air is warmer than 68° F., and the peroxide must be new. A good white can be obtained with peroxide without danger to delicate goods, but pains must be taken to wash it out afterwards.

Lace needs to be treated with special care during the bleaching process. For this use a very weak solution of chloride of lime and water, just sufficient of the former to give the water a faint smell. This provides an effective bleach which, in addition to its remarkable whitening properties, does not injure the lace. Another simple way of bleaching lace which has become discoloured is to press it gently with a warm iron and then sew in a clean linen bag. The latter is left to soak in olive oil for a whole day and night, and afterwards boiled in a lathery mixture of soap and water. When the boiling has continued for ¼ hour or 20 min., rinse the bag thoroughly in slightly starched water and then take out the lace. The latter should be stretched out to dry. *See* Cotton; Straw; Wool, etc.

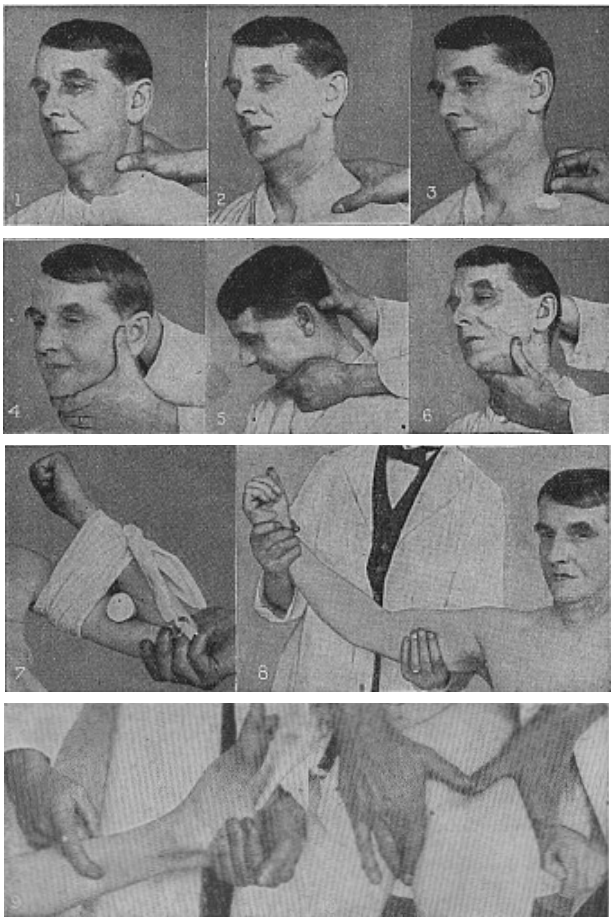
BLEACHING POWDER. By passing chlorine gas over layers of slaked lime, a pungent smelling white powder is obtained which is used for bleaching purposes, and is also employed a disinfectant. A liquid form is made by slaking the powder with water, about 2 oz. to the pint. When used as a bleach for clothes, a tablespoonful of the powder is added to a copperful of clothes.

It is useful also for removing mildew stains from linen. For bleaching engravings, a tablespoonful of the clear liquid is mixed with a pint of water and the engraving soaked in the liquid. It is necessary afterwards to remove all traces of the bleaching liquid by soaking the engraving in several changes of clean water, as any trace of chlorine left in the paper would in time cause deterioration.

BLEACHING SOAP. The chemical generally employed in these is perborate of sodium, a salt which releases oxygen on contact with water. Oxygen plays an important part in open-air bleaching, and when the bleaching soaps are used, the wash-tub does work that is ordinarily done during open-air drying. Bleaching soaps present one means of increasing the whiteness of articles which cannot be exposed for long.

BLECHNUM. This is a family of vigorous hardy and greenhouse ferns. B. brasiliense and B. glandulosum are grown under glass in a compost of peat, loam and sand, and need abundant supplies of water from spring till autumn, but do with less during the cold months. Blechnum spicant, the hard fern, grows wild in Britain; it is dwarf and evergreen. There are many varieties of this fern. Pron. Blek'num.

BLEEDING. Haemorrhage, or bleeding, may be external, as from a wound, or it may be internal. It may occur from arteries, veins, or capillaries, the small vessels which unite arteries to veins. Blood from the arteries is bright red, and comes in spurts, the direction of these being away from the heart. Blood from the veins is of a dusky red or a purple hue, and flows in a steady stream. Blood from the capillary vessels is redder than venous blood, and it oozes out of the surface of the wound. Of the three forms bleeding from an artery is the most serious. Vein bleeding can nearly always be stopped by pressure. Bleeding from capillaries is slight.



Bleeding. 1. Place for compressing common carotid artery. 2. Pressure to arrest bleeding from subcla-vian artery. 3. Pressure applied to subclavian artery by means of key handle. 4. Pressure applied to superficial temporal artery. 5. Compressing occipital artery behind ear. 6. Facial artery pressed against lower border of jaw. 7. Forced flexion of elbow joint to arrest bleeding from arm. 8. Pressure on brachial artery. 9. Bleeding from sole arrested by pressure on posterior tibial artery. 10. Compressing femoral artery.

Haemorrhage in certain parts of the body is given specific names. Cerebral haemorrhage (one of the causes of apoplexy) occurs from an artery in the brain; haemoptysis from the lungs; haematemesis, the stomach; haematuria, in the kidneys or urinary passages; epistaxis, from the nose.

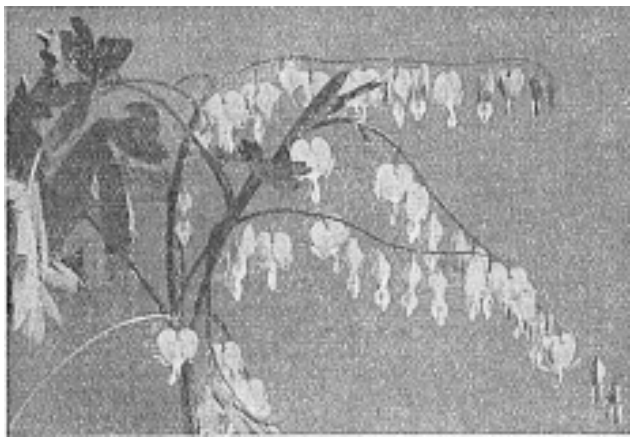
In wounds of the hand, arm, foot, leg, or other parts, the simplest plan to stop bleeding is to press the

fingers on the wound; or, if that is unavailing, then to apply pressure to the main artery. In bleeding of the forearm, one method of putting pressure on the brachial artery is to place a pad in the hollow of the elbow and bend the arm. Bleeding from the leg may be controlled by placing a pad in the hollow of the knee and bending the leg.

In the case of the thigh, the femoral artery is compressed against the bone in the middle of the groin. When the bleeding is from the neck, pressure is applied to the carotid artery, a little below and on the outer side of Adam's apple. In bleeding from the nose a cold cloth on the nape of the neck and another on the forehead are often effectual.

Another method of stopping bleeding is by the application of an improvised tourniquet. *See* Tourniquet.

In capillary bleeding over a large surface one may employ styptics such as tannin, perchloride of iron, gallic acid, turpentine, or alum; but very hot and very cold water often prove effectual. In internal bleeding, indicated by excessive pallor and a thready pulse, send for the doctor and meanwhile keep the patient perfectly still.



Bleeding Heart. Foliage and arching sprays of drooping pink flowers.

BLEEDING HEART. Dicentra or dielytra, popularly termed Bleeding Heart, is a herbaceous perennial, hardy except in the most exposed situations, and makes a bush nearly 3 ft. high. The pink flowers are borne on long arching stems, and are nearly an inch across, heart shaped, and particularly graceful in effect.

BLENDING. Indian or Ceylon teas are frequently blended with China tea, the strong coarse flavour of the Indian product being mellowed by the subtler and more delicate flavour of the China tea.

No fixed rules as regards proportions can be laid down, but the following would make a good blended tea: take 1 lb. coarse Indian tea, ½ lb. of China tea, ¼ lb. of Assam, with ¼ lb. of broken Pekoe.

Butter and margarine can be blended in the home, but such a mixture is not so good for children as genuine butter. The mixing may be done on a pastry board, the butter and margarine being worked together with the aid of wooden butter pats, or they may be melted together in a basin and then thoroughly stirred whilst cooling. *See* Adulteration; Coffee; Tea; Tobacco, etc.

BLIND: Their Training. Each local authority is obliged by law to provide suitable education for the blind children in its area from the age of five years. The parents should get into touch with that body in good time, so that the child is able to begin his schooling as soon as the age of five is reached.

When a person loses his sight in middle life, his friends should seek the assistance of the county education authority, for it is the duty of that body to see that blind persons receive such occupational training as will fit them to earn their own living. During training a maintenance grant can be obtained. Do what is possible to banish self-commiseration from the patient.

If blindness comes on in advanced age, the same principle of keeping alive in the patient's life as many interests as possible should be followed. His friends should get in touch with the nearest Home Teaching Society, which will send a visitor to teach Braille. A blind person unable to follow his employment can obtain an old age pension at 50. *See* Braille; Pension.

BLINDS. Blinds are out of fashion owing to the use of practical long and casement curtains; and also of pelmets or valances to finish the window scheme. Owing to these the lace edging of sitting-room or trimmed blinds is no longer required, and in town houses obscures the daylight when the blinds are only partially drawn up to show this decoration at the top of the window. For kitchen and back premises dark green blinds are best as they only require dusting and can be kept clean if sponged or wiped with a damp cloth. Even here oiled silk or American cloth is being used for casement curtains. Another substitute is the latticed outside shutter, which with easements open gives a sufficiently darkened room for sleep with a regulated supply of air.

Where holland or linen blinds are washed at home, the best plan is to unstitch the hems before putting them in the water. Then, if the material stretches, it may be cut to fit the roller and sewn up again, with little or no trouble, while, if it shrinks, the roller may be cut to fit the blind.

Fitting and Repair. Apart from Venetian blinds, almost all blinds in use are mounted upon rollers, upon which the material forming the blind is wound. The first thing to see about is that this roller is horizontal; if it is not, the blind will not roll up flat, but will creep over to one side.

When putting up a new blind a string can be stretched tightly between two thin nails driven into the framework of the window, the string occupying the place where the roller is to be fitted. This string should be tested with a spirit level and adjusted until it is horizontal. The simplest arrangement of mechanism

consists of two metal supports providing bearings for a plain wooden roller, with suitable pins in the ends to act as an axle. At one side of the roller is a V-shaped pulley wheel around which passes a stout string or cord, joined at the ends to make it continuous, tension being brought upon this cord by an adjustable wheel mounted in a metal framework known as a blind rack. Some of these racks have a ratchet arrangement; others a screwed rod and milled nut for adjustment. Racks of all patterns are fixed to the window frame by means of screws.

Points to watch are that the roller can revolve truly and freely; that the cord is sufficiently thick to grip the pulley; and that the wheel on the blind rack rotates easily. Cord tends to stretch, and needs continual attention if the blind is to function properly.

The renewal of the blind cord is done by winding the blind up to the top and removing the old cord and threading a new one through the hole in the lever, turning it once or twice round the spool and then through a hole in the roller end provided for the purpose. A knot is then tied in the cord, and this prevents it from pulling out of the hole.

Automatic or spring blinds are made with a hollow roller, into which is fitted a coiled spring. One end has an automatic ratchet action. With these blinds no cords or controls are necessary. The blind is merely pulled down as far as needed. Another form of spring blind has a hollow roller, in which a spring is located at one end of the roller, also a ratchet with a spring-pressed lever pawl. This type is good for general domestic use. *See* Sun Blind; Venetian Blind; for other treatment of windows, *see* Casement, Curtain, etc.

BLISTER: How to Treat. A blister is an accumulation of fluid beneath the superficial layers of the skin occurring in skin diseases, burns, from the use of vesicants, and as a result of chafing and pressure. The last variety is usually found on the hands and feet. When much walking has to be done, the feet should be washed with a solution of alum or with methylated spirit or weak formalin. The feet and the insides of the socks can then be dry rubbed with a soap or a smooth dusting powder applied. If blisters form they should be pricked with a clean needle and covered over with boracic ointment on a rag, fastened on smoothly. Blisters which occur on the hands are dealt with in the same way. *See* Foot; Hand; Skin.

BLOATER. These herrings, which are cured at Yarmouth and other seaports, are usually grilled or fried. The head is removed, and the bloater may either be cooked as it is or split open, the backbone and roe removed, the roe being cooked separately. In the latter case, to fry the fish, heat a little dripping or lard in a frying-pan until a faint blue smoke arises, then drop in the fish, inside down. When browned turn it over. To grill, lay it, inside up, on a heated, greased gridiron and turn when brown. Another method of treating bloaters is to place two, insides together, on a gridiron and broil them over a clear fire. In all these cases the fish will take about 7 min. to cook thoroughly. They are best served very hot. *See* Herring; Roe.

BLOATER PASTE. For a savoury paste, grilled bloaters have more flavour than those cooked ill water. Cook one dozen large bloaters about 10 min. or till the skin and bones come away easily. When free from these, pound the flesh finely with about half its weight in butter.

Rub with a wooden spoon through a fine wire sieve; season with cayenne and powdered mace to taste, and press it into small dry pots, leaving a space of ¼ in. on the top of each. To make air-tight, pour in melted mutton fat, and leave till they are set hard. Mutton fat being harder than beef is less likely to crack across or melt.

BLOODHOUND. Easily trained for police work and often so used, this dog, in spite of his bulk and manifest strength, is gentle and obedient. He is an affectionate companion, and a trusty custodian of any property.



Bloodhound. Specimen of the breed famed for keen scent and used for hunting and police work.

A solemn-looking dog, standing a little over 2 ft. and weighing about 110 lb., he varies in colour from black-and-tan to red-and-tan or tawny, with perhaps a little white on the broad chest, the feet and tip of tail. The narrow head is long in proportion to the length of body, with folds of loose skin, especially over the forehead. The eyes are deeply set, and the long, thin ears hang straight down in soft folds. The forelegs are straight and large-boned, the feet large and strong. The long, tapering tail is carried high with a moderate curve. *See* Dog.

BLOOD POISONING. Three distinct conditions are comprised under the name of blood poisoning. When the blood absorbs only the poison produced by disease germs, the resulting condition is termed septicaemia; if the germs as well as the poison

are circulating in the blood, septicaemia results. In pyaemia the germs are carried by the blood to various parts of the body and cause multiple abscesses to break out.

The chief symptoms of mild sapraemia are headache and fever; in septicaemia there are shivering, pains in back and limbs, hot and cold sweats, and high fever. Septicaemia is usually due to the introduction of pus-producing organisms through a puncture, e.g. a pricked finger.

When shivering and fever follow the slightest wound, no time should be lost in sending for professional aid, as both septicaemia and pyaemia may require surgical treatment.

BLOODSTAINS. To remove bloodstains from silk or wool, these should be washed with water and rubbed with soap liniment. For cotton and linen goods use solution of chlorinated lime (bleaching powder), and wash out the solution with clean water. Where the stain is old-standing it is sometimes necessary to employ pepsin.

Blossom Wilt. As this pest attacks apples, particularly certain varieties, it is generally known as apple blossom wilt.

BLOTCH. This may consist of pimples, discoloured areas of the skin, or small groups of pustules, and may occur in connexion with skin diseases or eruptions. A blotchy face is not uncommon in constipation. A laxative should be taken, as cascara tablets or sulphur at night, or Epsom or Carlsbad salts first thing in the morning. Sugar, sugary foods and pastries should be left out of the diet, though fats need not be reduced. It is probable that in most cases more open-air exercise is needed. In washing, too coarse a soap must not be used, and if the water is hard add a little borax.

The following ointment will be found useful:

Oxide of zinc powder	1 dram
Precipitated sulphur	10 gr.
Salicylic acid	10 gr.
Concentrated camphor water	10 minims
Lanolin	1 oz.

See Blackhead; Pimple.

BLOTTER. To make the simplest kind fold and stitch about six sheets of strong blotting paper, the size of an exercise book or larger, into a cover of stout coloured paper. This may be quickly ornamented by stencilling (q.v.). Alternatively, make a cover of two sheets of cardboard, fastened, together by a strip of linen, glued securely down one side of each. To this linen stitch the blotting paper, and the book is ready to slip into a loose cover.

For an embroidered blotter cover, take ¾ yard of silk, linen or other plain material, with the same quantity of lining silk, 1¼ yards narrow galon and a piece of cardboard, 18 by 11½ in.

Cut an oblong in the covering material and also in the lining measuring 19 by 12½ in. Fold the material in half, across, and in the middle of one half draw or transfer the pattern selected for embroidery or appliqué work. Decoration must be done before the blotter is made up.

Half an inch has been allowed for turnings and the cover and lining must be seamed along three sides; the cardboard is then slipped in, the fourth seam closed and the inside of the blotter is finished off all round with galon. The blotting paper is attached by means of a tinsel cord to which a tassel may be added.

Blotters may be covered with brocade or shot taffeta edged with tinsel galon and finished with a heavy silk and beaded tassel, arranged to hang over the edge of the writing table.

A leather cover can be made with no other tool than an embroidery needle. An oblong piece of dark sheepskin is needed, large enough for the back and front cover to be in one piece. One inch extra should be left all round for turnings and an inch for the fold at the back. A pattern should then be designed in the centre of the front, and outlined in coloured fine cord stitched down, or couched, with sewing silk all round its edges and across it, as desired. The rest of the design can be filled in with coloured beads.

Two pieces of stiff cardboard are then needed, as mounts for the back and front. Cover them with soft interlining (domette is the best) and lay in place on the leather. Turn an inch of the leather down over the mount and fasten it securely by means of long stitches from top to bottom and from side to side. Cover these stitches with interlining, and then slipstitch in a silk lining of a colour to match the design. Such a blotter is suitable for dining-room or study. Colours should be in harmony with the decorative scheme of the room.

A blotting pad is simple to make. Across each corner of a large piece of very stiff cardboard fasten a strip of American leather or suède, about 2½ -3 in. wide, glueing the ends round underneath the board. Several thicknesses of blotting paper the same size as the cardboard can then be secured on it, by slipping each corner under one of the triangles so formed. Blotting paper can be obtained in nearly all colours to match covers or corners.

Blotters can also be obtained made in the form of a semicircle of wood, with a handle fastened into a thin piece of wood which fits, and is screwed down, on to the flat side. The blotting paper is placed on the curved part, the ends being slipped under the handle to keep it secure. *See* Leather Work; Writing Table.

BLOTTING PAPER. Besides its obvious use, blotting paper is effective in removing grease from clothing. Heat an iron, lay a pad of blotting paper over the grease-spot, and pass the iron over it, allowing sufficient time for the heat to penetrate. When the

blotting paper is removed it will be found to have absorbed the grease.

A filter for water can be improvised with a piece of clean white blotting paper cut in a circle, according to the size of the vessel into which the water is to be filtered, and folded into three, to make funnel-shaped, and inserted into the bottle or jug. For pressing and keeping flowers blotting paper is used owing to its absorbent quality.

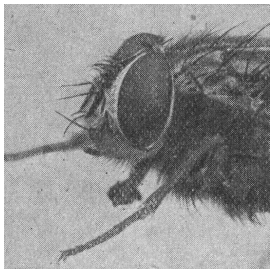
BLOUSE. What may be termed the two classical styles of blouse are seldom quite out of fashion in some form. The first of these is the tailored shirt blouse to the waist, and the second the Russian overblouse or tunic, belted, fastening down the side-front and pouched at the back.

Most fashion journals illustrate styles of blouses that are in vogue, and it is quite easy for the home worker to select a pattern and adapt it to her own requirements.

BLOW-FLY. This is a large, stout-bodied, two-winged fly of a steel blue colour, whose presence indoors is made known usually by a loud buzzing noise.



Blow-fly eggs.





Fully grown blow-fly.

Higly magnified head of a bluebottle, showing its relatively large eyes.

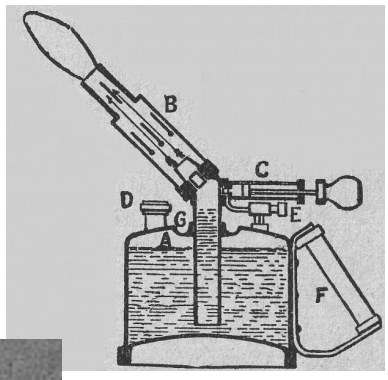
The blow-fly or bluebottle lays its 500 to 1,000 white eggs in batches on such joints of meat as it can reach, cooked or raw. These eggs hatch in the course of a few hours, and white, legless maggots or gentles issue from them. In spite of the absence of jaws or any cutting apparatus, these apparently helpless creatures are able to break down the firm muscular material of the meat and use it for their own sustenance. This they accomplish by pouring out a fluid from the mouth which rapidly dissolves the firm flesh and reduces it to a condition in which the gentles can absorb it. A few days of continuous feeding bring the maggot to its full size, and it changes into the pupal form within the larval skin, which hardens and turns dark red. About a week later the pupa skin splits to release the perfect blow-fly.

Blow-flies are not bred in ordinary dwellings; they come in from without. Great care should be taken, therefore, to prevent their access to any flesh foods. The larder window must be kept open for ventilation, but it should be covered securely by a sheet of wire gauze. Should the female fly have deposited batches of eggs, these should be at once cut out and the joint washed with a solution of boracic acid.

Besides the bluebottle described, there is another blow-fly of similar habits. It lacks the blue tint and instead is black, but owing to the disposition of the delicate hairs with which it is clothed, it appears to be chequered with black and grey, and the forebody appears to be striped. Its eyes are red.

BLOW LAMP. Plumbers, gas-fitters and electricians use the blow lamp to cut and make up connexions, painters to blister old paint so that it may be easily scraped off. The instrument consists of a strong body of sheet steel or brass, A, capable of holding from a quarter of a pint, in the small sizes, to two pints or more in the larger ones, of petrol, paraffin, or kerosene. The spirit is forced through a nozzle in a very fine annular jet into a special Bunsen type burner, B, either by means of compressed air or by warming the body of the lamp. As the spirit passes through the burner it is more or less completely vaporised by heat from the walls of the burner, which become very hot, and at the same time draws air in with it. The result is a very hot, strong flame. The diagram shows a form for burning paraffin oil, in which an air pump, C, is used. There is a groove, G, running round the base of the burner, in which a little methylated spirit is placed and lighted when starting the lamp, to give a preliminary heating. D is the filling cap, E a relief valve to reduce pressure when needed, and F, the handle.

Diagram of a blow lamp, showing how the appliance acts.

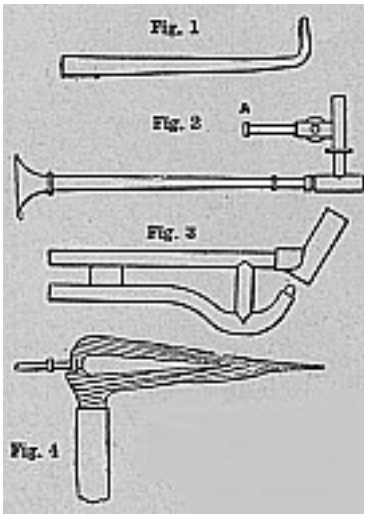




Blow lamp in use for removing old paint.

A few strokes of the small air pump, forming part of the lamp, develop the necessary pressure to force out the jet of oil, and, once started, the heat of the burning flame is usually sufficient to keep the lamp going, though a stroke or two of the pump may be given when needed.

BLOW PIPE. The many forms of the blow pipe in use, from the simple bent tube to elaborate appliances, are divisible into two classes: those blown by the mouth, and those operated by mechanical means, which may be merely a special form of bellows. The object in all cases is the same, namely, to supply an extra amount supply an extra amount of oxygen, either as oxygen or as air, to a flame or jet of burning liquid or gaseous fuel, or a mass of solid fuel, to increase the intensity of its heat.



Blow pipe. Figs. 1-4. Forms of pipe employed for different purposes.

The simplest form is shown in Fig. 1, and consists of a piece of metal tube bent and tapering to a point; air is blown through this from the wide end by the mouth. Fig. 2 shows a mouth blow pipe with a connexion at A to a source of gas, and Fig. 3 shows an injector blow pipe to be blown by bellows.

In using the common blow pipe, some skill and practice are needed to maintain a steady stream of air from the mouth. The blast is to be kept up by utilising the muscles of the cheeks, breathing being carried on through the nostrils alone.

The introduction of the jet of air from the blow pipe into the body of the flame, as shown in Fig. 4, gives rise to a double combustion. The outside of the large, shaded, hollow cone is burning with the aid of the external air; the inside with the aid of the forced jet of air from the blow pipe. In consequence, the shaded cone part acquires a very high temperature, more than sufficient to soften a bar of iron, or an iron tube to bend it, to solder any common article, or to weld two pieces of iron together. *See* Bunsen Burner.

BLUE: The Colour. For laundry use, blue consists of indigo, prussian blue, or ultramarine, in solid or liquid form. It is used in the rinsing water for white clothes, to neutralise any yellow tint after washing. It is also, for the same reason, used to rinse white hair. The solid blue sold in various shapes and in small bags consists of a mixture of 10 parts of ultramarine, 10 parts of bicarbonate of soda, 3 parts of liquid glucose. These ingredients are ground together in a mill until a stiff paste results. From this various shaped cubes or cylinders are cut, which are afterwards dried. On account of the presence of bicarbonate of soda the blue is a remedy in cases of wasp sting. For this purpose the blue bag is moistened and dabbed on the stung part.

Liquid blue, which is often preferred to solid blue for laundry purposes, is made by mixing prussian blue, 4 oz., and tartaric acid, ½ oz., with one gallon of hot water, and stirring occasionally with a wooden stirrer for twelve hours. Then strain through a woollen cloth. Another method is to dissolve 1 p.c. of aniline blue in water, the advantage of this variety being the absence of acid. *See* Colour.

BLUEBELL. The wild hyacinth that flowers in the woods in spring is popularly known as the bluebell. It improves with cultivation if grown in cool shady places with a moist soil. The bulbs are best planted deeply (6 in. deep is not too much), and when suited will send up an abundance of deep blue spikes year after year. There are many varieties, some bearing pale blue, some white, flowers. *See* Harebell; Hyacinth; Scilla.

Bluebottle. *See* Blow-fly.

BLUE FLY. This name is given to one of the many aphides pests which infest gardens and plants. It attacks roses and other subjects growing under glass. The best treatment is by nicotine fumigation, assisted by sprayings of soft soap and paraffin emulsion. *See* Rose.

Blue Gum. *See* Eucalyptus.

BLUE MOULD. Starting from minute spores, this appears as a small white speck, which spreads gradually over the surface of the food until a large area is covered, the older parts of the growth being blue or greenish-blue in colour.

It is really a plant which grows best on a moist surface. Jams, preserves, bread, flour, condensed milk, fruit and cheese are amongst the articles on which the mould may grow. In the production of certain cheeses, such as Gorgonzola, blue mould helps to produce the typical appearance and flavour of the cheese.

To prevent the occurrence of blue mould where it is destructive, food should be kept covered and in a dry place, and food tins should have well-fitting lids. Oiled paper should be put on jam while still hot from boiling to keep out the air; or a little melted paraffin wax poured on to the surface of the jam as soon as it has set. *See* Cheese.

BLUE OINTMENT. Named from its colour, this ointment is prepared by rubbing together metallic mercury and benzoated lard. A small proportion of suet is added to stiffen the ointment. It is employed in

skin diseases, chronic inflammations, and enlargements of the glands, also for killing parasites. It is better to use it in a diluted form (one part of the strong ointment with two parts of lard) to avoid the risk of salivation.

BLUE PILL. An old-established remedy for liver complaints is the blue pill, followed next morning by a black draught (q.v.) or saline. It is a blue mass, consisting of metallic mercury rubbed for a long time with confection of roses and powdered liquorice root. The dose is from four to eight grains.

BLUE PRINT. A kind of photograph of bright blue colour, known as a blue print, is made by printing from a negative on to a special paper which may be bought as ferro-prussiate or cyanotype.

To make a print, a sheet is laid with the yellowish coated side in contact with the negative in a printing frame and exposure made to bright daylight until, on opening one half of the frame, it is seen that a greyish-blue picture is visible. The picture must appear much darker than it is required to be when finished; and the shadow parts should have a semi-metallic, choked-up appearance.

When it is judged that exposure has been sufficient, the print is simply soaked in clean water, when it quickly becomes of bright blue colour, showing all details. It is washed for a few minutes in water and left to dry by hanging up at a little distance from a fire.

Blue print paper is very largely used for making copies of engineers' plans or drawings, etc. When exposed to light behind an original of this kind it will yield an excellent copy in white lines on a blue ground. *See* Dark Room; Developing.

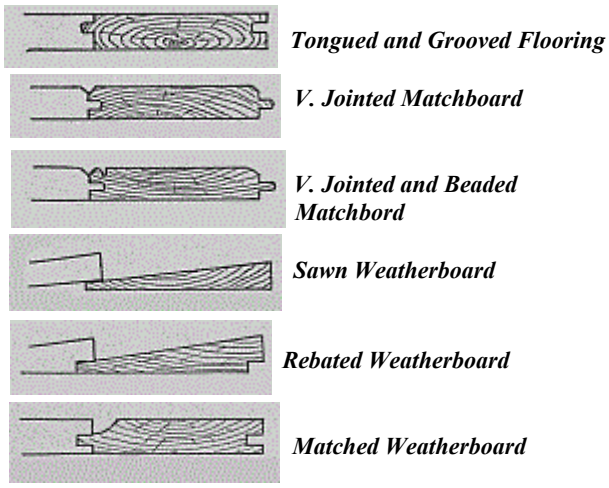
BLUE STONE. Sulphate of copper crystals is so named. It is most popularly known as an application for exuberant granulations, or proud flesh, and it stimulates the healing of sluggish sores. The crystals may be rubbed on or used as a solution in water. Copper sulphate is a speedy emetic in narcotic and phosphorus poisoning, in a dose of 5 to 10 grains, but the doctor should administer it. It is recommended for styes as a one p.c. solution, applied every half-hour after the affected eyelashes have been pulled out.

Chronic poisoning produces a green line along the gums. In poisonous doses it acts as an irritant. After the use of an emetic, white of egg and milk should be given, and followed up by drinks of barley water and thin arrowroot. Fomentations may be applied to the abdomen to relieve pain. *See* Poisoning.

BOARD: Varieties and Uses. A board as generally understood means a plank or piece of wood relatively long in proportion to its breadth and thickness. In the timber trade a board is reckoned as 1 in. thick, and most hardwoods, whitewood, walnuts, etc., are sold by board measure, at per foot super. If the material measured 2 in. thick, then the price at 6d. per foot super would be 1s., because there are two layers, as it were, each worth 6d.



Square Edge Board



Board. Sections of standard prepared board used in building.

For general indoor use, and many outdoor jobs as well, the ordinary wood, known as yellow or red deals, answers very well. Such deal is sold in planks, that is, 11 by 3 in.; deals, that is, 9 by 3 in.; battens, that is, 7 by 2 ½ in. From pieces of timber of these basic sizes all smaller sizes are of timber cut.

The term prepared boards means that the edges and one flat surface have been machined or planed smooth by machinery. A rough board is one that has been left by the saw. Shelving boards are cut 9 in., 10 in., or 11 in. wide, and ¾ in., 1 in. or 1¼ in. thick. They are planed on face and two edges, and sold by the lineal foot or per foot run.

Matchboard is made in several thicknesses and widths; it is planed on one side, and machined on each edge. The sections illustrated are the ones most generally used. Weather-boarding is made in two general forms—the ordinary tapered or feather-edge board, and the rebated, which presents a flat surface on the interior and the familiar appearance on the exterior. A matchedweatherboard is also made; this is tongued and grooved and machined, as shown in the diagram. Matchboard and weatherboard are sold by the square, that is, 100 nominal square feet.

For the average indoor use ordinary square-edge planed boards can be purchased from stock at most timber yards in 3 in., 4 in., 5 in., 6 in., 7 in. or 9 in. widths and ½ in., ¾ in., 1 in., and 1¼ in. thick. Flooring is usually stocked in ¾ in., 1 in. and 1¼ in. thicknesses, 1 in. being that most generally in request.

Matchboard is made in ½ in , 5/8 in., ¾ in., and 1 in. thicknesses, and 4¼ in., 5 in. and 6 in. widths. The quoted thicknesses of boards are always nominal, being derived from the deal or plank from which the material is cut. Thus a ½ in. board will only measure a full ⅜ in. actual thickness, and a board nominally 6 in. wide will only hold up to 5 ⅞ or possibly 5 ¾ in. if planed on both edges.

When using boards for shelving it is important to

see that the thickness is adequate for the space to be spanned by the board. In general a 9 in. by ¾ in. board will only span 2 ft. without sagging, under normal loading. The special uses of manufactured boards are dealt with in a plate on the previous page. *See* Floor: Matchboard, etc.

BOARDING HOUSE. In towns or at the seaside boarding houses resemble private hotels, and differ from furnished apartments in the fact that the guests take their meals in the same room and share a general sitting-room, in which a piano and comfortable chairs and couches are usually provided. In large cities boarding houses seldom provide more than two meals a day, breakfast and dinner, except on Sunday, when all meals are provided. The terms for room and meals are inclusive. At seaside boarding-houses lunch and afternoon tea are usually provided at an inclusive charge. City boarding houses charge much the same all the year round, but the boarding- houses at watering places, which have no winter season, increase their tariff during the summer season. This culminates in August, which is, as a rule, the most expensive month in which to seek holiday accommodation.

A boarding house keeper, as distinct from a lodging house keeper, has no right to detain a boarder's luggage for an unpaid bill. On the other hand, she is not liable for the safety of the boarder's luggage or belongings, unless she is guilty of negligence. In a case where a servant was taken on who was a convicted thief, the boarding house keeper was held guilty of negligence, because she engaged the servant without any inquiry, and under such circumstances that she might have known the sort of servant she was engaging. So that, when the servant stole from the boarders, the boarding house keeper was held liable. *See* Holiday; Lodgings.

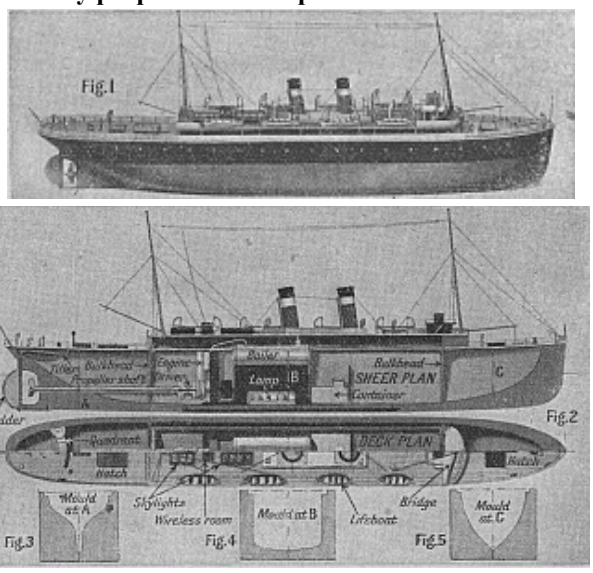
BOARD WAGES. A servant who is engaged in the usual way, that is, at a wage, with the mistress to provide food and drink, cannot be compelled to accept board wages, but if the mistress does not provide the food and drink the servant is entitled to provide them herself and can claim the cost from the mistress. In England, if a mistress dismisses a servant with a month's wages in lieu of notice, she only pays ordinary and not board wages. In Scotland she must pay a month's board wages, to compensate the servant for the board she could have had during the month. *See* Servant.

BOAT: THE MAKING OF A MODEL

Fascinating Work for the Amateur

The reader should consult also the articles on Aeroplane; Engine and other Models; also Soldering; Woodworking. A companion article is the one on Yacht.

The making of a good working model boat is a fascinating occupation for the amateur. In this article full instructions are given for making (a) a model cross-channel steamer of modern type, and (b) a fast electrically propelled model speed-boat.



Boat. Fig. 1. Model cross-channel steamer which can be made by the amateur. Fig. 2. Sheer plan and deck plan. Figs. 3-5. Drawings giving form of hull at the three critical points indicated on plans above.

In the construction of the steamer (Figs. 1 to 5) commence by making the hull from a solid block of sound pine or deal, free from knots. This block when finished must measure 24 in. long, 3 in. wide, and 3 in. deep. If a larger boat is required the drawings can be enlarged in proportion.

The hull can be shaped as follows. Plane the wood block smooth and flat on all four sides, and draw a centre line along the top and bottom faces. Square off the three section lines, A, B, C (Fig. 2), on all sides of the block. Mark on the upper and lower faces of the block the deck line, and on the sides of the block mark the sheer line or profile. Now saw away the surplus wood nearly to these lines thus producing a boat-shaped block.

To ensure getting the hull the correct shape, cut three cardboard moulds, shaped as shown in Figs. 3-5. Apply these from time to time to their corresponding section lines while the work of shaping goes on. This is best done with the aid of chisels and gouges, working from the middle towards the ends until all three moulds fit properly, their upper edges flush with the upper part of the block. Mark off the sheer-line and cut this to shape. Then hollow out with gouges and chisels the interior of the hull, taking care not to run the tools through to the outside. Cut a deck from a piece of yellow pine 3/32 in. thick, and fix it temporarily with a couple of fine brads.

To complete the hull, cut a recess ¼ in. wide into the bottom of the hull on the outside and fill it with lead. Then cut away the middle part of the deck, so that the whole of the superstructure can be lifted off to get at the machinery. The superstructure and bridge are made from 3/32 in. pine or cigar-box wood. The

captain's cabin is cut from mahogany, and the windows and doors drawn on it with Indian ink, and coloured with water-colour paints. The railings are made from model stanchions and floral binding wire secured with solder.

The funnels are made of tin-plate, the stays being floral binding wire soldered in place as shown. The top of the funnel is beaded over, and a wire ring soldered beneath it. The two hatch covers and the skylights are cut from mahogany. A cigar-box offers useful material for this kind of work.

The lifeboats are carved from solid yellow pine blocks, fitted with seats, and mounted on flat pieces or chocks secured to the deck with glue. The davits are made from brass wire, 3/32 in. diameter, flattened at the ends and drilled to receive a hook, blocks, and falls.

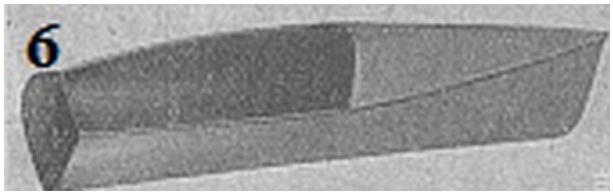
The rudder is cut from sheet tin or zinc, soldered to a brass wire 3/32 in. diameter; this passes through a brass tube let into the stern. The rudder post is afterwards bent over at right-angles to form a tiller. The end is bent over so that it presses on the notched brass quadrant screwed inside the hull; the friction holds the rudder in position.

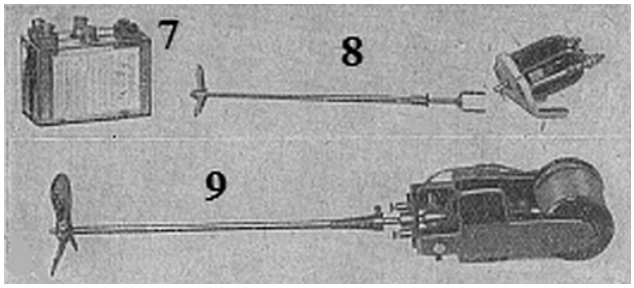
The propeller shaft and stern tube shown in Fig. 2 are best purchased ready for use, as are the ventilators. Additional fittings can be represented if desired, as shown in the illustrations. The hull should now be painted inside and out in any desired colours, and the various parts assembled in place as in Fig. 2.

The drawings which are here given show a steam engine and boiler that can be purchased at a moderate price from Bassett-Lowke, Ltd. Northampton, and capable of running the boat for over a quarter of an hour; alternatively a clockwork motor can be purchased at any model shop, but will only run the boat for a minute or two. A special type of electric boat motor, known as the Nautilus, if energised with a small 6-volt accumulator, is suitable for this boat, and should run it for 20 min. or so on one charge.

Making an Electric Speed-boat. The hull for this boat, 24 in. long (Fig. 6), is of sheet zinc; it has almost a flat bottom, and tapers off at the bows to a sharp, thin cutwater. When the loading is suitably distributed (i.e. the greater proportion of the weight at the stern) the bow lifts and skims the surface in true speed-boat fashion. The hull is fashioned from a flat piece of zinc, which is bent up and joined at the front to form the bows. The stern is finished off with an outwardly sloping transom, this being, of course, a separate piece of zinc. The spray hood extends back from the bows for about half the boat's length, and gives an attractive outline to the craft. The height at the stern is 3 in., and at the bows just double. The width of the cockpit where the spray hood ends is 5¼ in., tapering off to 4 in. at the stern.

The amateur who does not care to tackle the job of making such a hull can procure one from Whitneys, 129 City Road, London, E.C., who supply the power plant here illustrated and described. The hulls are made 24, 30 and 36 inches long, and also in the metre size. We will assume that the 24-in. hull has been made or purchased. A permanent-magnet motor to suit this size will run from a dry battery (Ever Ready No. 126), or a special low-built light-weight accumulator may be purchased. This, while costing three times as much as the dry battery, has the advantage that it can be re-charged quite cheaply. Fig. 7 shows the motor with propeller shaft, stern tube and three-bladed propeller.





Boat. Model Electric Speed-boat. Fig. 6. Hull which is made of zinc. Fig. 7. Accumulator. Fig. 8. Motor with propeller shaft, stern tube and three-bladed propeller. Fig. 9. Larger power plant suitable for 36 in. hull.

The motor shaft has a projecting pin which engages with the forked end of the propeller shaft and so acts as a driver. The motor frame is already set at an angle, so that when it is screwed down by its lugs to a wooden base made to fit the floor of the hull, the shaft will be inclined approximately at the correct angle to line up with the propeller shaft. The stern tube, through which the latter protrudes, must be soldered into a hole carefully made in the hull. The propeller shaft is supported further by a simple bracket made from a strip of brass bent up and soldered to the hull. The inner end of the stern tube is provided with a stuffing gland to exclude water. The tube may rest on a block fixed to the wooden base, and may be secured by a brass or zinc strap passing over the tube and screwed to the base. A clip for the dry battery or accumulator should be fixed at the stern.

A wooden dashboard may be fitted just under the mouth of the hood, and a simple switch on this will start or stop the machinery. The rudder is made from sheet zinc or brass, and soldered to a brass post. The post passes up through a brass tube soldered to the hull and protruding through the deck. The rudder is held in place, when set, by a lock nut. Fig. 8 shows a larger motor for a 36-in. hull. Two 4-volt accumulators in parallel are needed for this set. The motor is mounted parallel with the floor of the hull, and is connected to the inclined propeller shaft by a flexible spring coupling.

Bobbinet. Machine-made plain net made with extra stout cotton and suitable for window curtains. *See* Lace.

BOBBIN LACE. Lace hand-made, not with the needle, nor by knitting nor embroidery, but by twisting and plaiting threads into a pattern, is known as bobbin lace. Other names for the same kinds are pillow ace and bone lace (now obsolete). A design is drawn in pencil upon cardboard and points are inked and then pricked to show where the gimp must be made. A tracing of this draft is made on parchment, and this is fastened down upon the lace-making pillow. Solid-headed pins are then inserted at the pricked holes.

The bobbins from whence the name comes are wood or bone, and carry the thread. Two threads are tied together, and they, with their bobbins, hang upon the pin. The lace-maker deftly throws one bobbin over another, using the pins as the key to the design.

BOCCONIA. The plume poppy or bocconia is a fine herbaceous perennial plant, growing 6 to 8 ft. high, with glaucous leaves and long plumes of buff-coloured flowers. It loves a deep, moist, substantial soil, and thrives in well-tilled clay. It is effective if a small clump of it is grown in an isolated position as a form of lawn decoration. Propagation is by division in autumn or spring under glass, and by pieces of root laid in shallow boxes of gritty soil in a frame in spring. Pron. Bok-coney-er.

BODKIN. A thick needle with a blunt end and a wide eye for threading elastic or ribbons through slots or lace, etc. A good substitute is an ordinary safety-pin, which also has the advantage of not becoming unthreaded in the middle of a hem.

BODY BRUSH. In best makes bristle only is used, the knots are wire-drawn, and the backs screwed on as with good clothes brushes. The handles, which are lengthy for convenience and straight or bent to suit various tastes, are usually made of beech or similar hardwood.

Cheap fibre mixing brushes, which are harsh, or pure bristle of white and grey, can be had of any required stiffness. They should not be left lying on their backs in a sodden condition when not in use, but hung or propped up to drain and dry. Occasional rinsing in hot water to which a little ammonia or antiseptic preparation has been added will tend to keep them wholesome. *See* Brush.

BOETTGER WARE. Genuine pieces of the jasper-like stoneware in dark red, which was produced by the inventor of Dresden china early in the 18th century, are rare. They may bear imitations of Chinese marks, or the famous crossed-swords device, or be unmarked. Unglazed red ware of German make has been faked up and passed off as Boettger.

The various styles include half-busts or figures with the drapery beautifully polished in a lathe, sprigged teapots, beakers and candelabra, besides vases with lacquered or enamelled designs. All these form effective ornaments for the living-room, but do not mix well with more delicate work, such as Chinese floral pieces or old decorated white china.

BOG: In Gardening. An artificial bog is a piece of moist ground, natural or prepared, in which may be grown water-loving plants which do not actually require a pond or stream. These bogs are usually made of concrete or Portland cement basins, about 1 ft. in depth, and filled with peat and loam. The bog is kept wet by means of a drip from natural or artificial sources.

Most of the ferns make good bog plants, and other popular specimens are the sundew or drosera, hardy lady's slippers, side-saddle flowers or sarracenias, butterwort or pinguicula, marsh marigolds, and Japanese primroses. *See* Water Garden.

BOG BEAN. This interesting aquatic plant is sometimes found by the edges of streams and pools. It is called Menyanthes trifoliata, and is also known as the buck bean. It is herbaceous and flowers in early summer, the flowers being bell-shaped, white inside, and streaked with red outside. The flowers are borne on stems which float on the surface of the water.

The bog bean is easily propagated by taking short lengths of the stems and pegging them down with carnation pegs to the moist ground or bottom of the water, until they throw out roots. *See* Water Garden.



Bog Bean, a plant for the water garden.

BOG OAK. This is the name given to oak found buried in peat bogs which centuries of immersion have turned to a deep black colour. It has applications in cabinet-making. In various parts of Ireland where deposits of bog oak are found a considerable industry exists in carving and fashioning this material into curios for souvenirs.

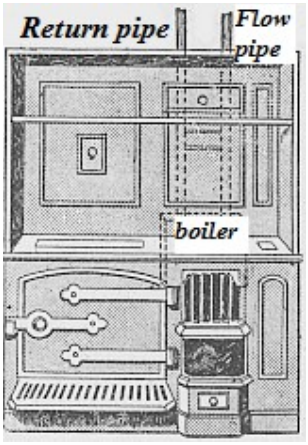
BOIL: How to Treat. A boil is caused by a germ finding its way into the skin either into a hair follicle or elsewhere, there setting up inflammation. A cause may be any temporary falling off in the patient's health, but the general health may be apparently good.

Over-eating, especially of rich foods, is a cause of boils. The patient should keep for a few days to a light diet and avoid alcohol. Boiled Spanish onions are beneficial. The boil should be sponged several times a day with a solution of one part carbolic acid to 20 parts water. If it is about the nostrils or in the ear, medical treatment is necessary, and a physician should be consulted.

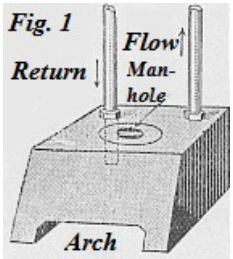
Impaired nutrition through under-feeding may cause boils in young children. The diet should be carefully looked to in such cases. Chemical food will be a good tonic. The skin all round the affected area should be washed every day with saturated boracic acid solution, and the following ointment is then applied: boracic acid powder, one dram; vaseline, one ounce.

More sunlight and more hours spent out of doors will also help greatly to build up the general health, and if a change of air is possible it may be the best thing. *See* Gumboil.

BOILER: For Hot Water Supply. The development and successful use of any hot water boiler depends upon an appreciation of the fact that water rises when it gets hot. It is easy to see, therefore, that in an enclosed boiler the water will tend to rise as it gets hot. If a regular supply of cold water be introduced through a pipe at the bottom, and another pipe be taken from the top of the boiler, the hot water will rise up this pipe, and the heated water can be stored up in a tank at any convenient spot in the house above the level of the boiler. The storage tank is connected by a second pipe to the bottom of the boiler. The pipe that the hot water goes up is known as the flow pipe, the other as the return pipe, and both should be 1¼ in. diameter.

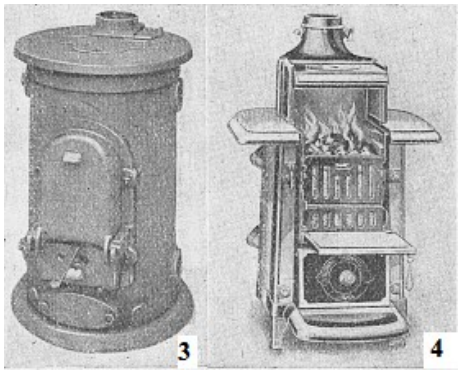


Boiler. Fig. 1. Type largely used in kitcheners, and shown in position in Fig.2 (right) by dotted lines.



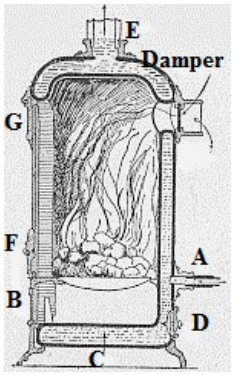
A boiler of this type (Fig. 1) is generally placed at the back of the kitchener, as indicated in Fig. 2. The direct heat of the kitchen fire is about three times the value of the due heat at the sides and back of the boiler, so that the most efficient boilers are those nearest to the direct heat of the fire.

Many of the troubles of boilers are caused by the assumption that they are self cleansing. The water, however, unless it is "soft" and free from lime, must be regularly drained off, the stove itself taken apart sufficiently to give access to the boiler, and the manhole or clearing plug located and unscrewed. When the manhole is opened and the water remaining in the system escapes, a can should be placed to catch as much of the water as possible, and an old sack or two used to soak up the remainder. After the boiler has been emptied, the scale or fur is removed by scraping it out with a metal chisel or a piece of hoop iron.



Boiler. Fig. 3. Independent boiler which produces a constant supply of hot water. Fig. 4. (Right) Boiler which will supply hot bath water and may also be connected with two small radiators or a towel rail.(Smith &Wellstood, Ltd., and National Radiator Company, Ltd.)

When a boiler is heavily coated with fur the coating acts as a screen or insulator between the water and the heat from the fire. It also prevents the water from coming in contact with the metal of the boiler. Contact is necessary to prevent the iron from burning away, and this is most likely to happen where the deposit is thickest and the heat is greatest, just at the crown of the arch forming the flue beneath the boiler. After scrupulously cleaning the boiler, wash it out thoroughly and replace the manhole covers, well bedding them down with red lead, putty, and a piece of stout string coiled around and pressed down into the bed before replacing the cover, which must be screwed up tightly.



Boiler. Fig. 5. Sectional diagram of a dome-top boiler. A. water inlet; B. grate level below which is a water way, C; D. mud hole; E. hot water outlet; F. fire door; G. feed door.

Independent Boilers. The home installation of a new hot water system is most conveniently carried out by the amateur if the independent type is chosen. These, being self-contained, can be placed in any part of the

building on the ground floor, or in the basement, provided they are not nearer than 18 in. to any woodwork and that any requirements of local authorities or fire insurance companies are complied with. The boiler should stand on a good solid bed of concrete (q.v.) or other fireproof material. The outlet flue is generally made of cast or wrought iron in the form of a stove pipe. The water supply and the flow and return pipes should be of iron, except in certain districts where the water is very soft, in which case copper or lead pipes will have to be used.

In summer, gas or electric heaters are advantageous; but in general coke or anthracite boilers are best. The one in Fig. 3 will burn anthracite, broken coke, or coal, and consume all combustible household rubbish. The boiler shown in Fig. 4 is intended to supply hot water for the bath. It is generally possible also to heat one or two small radiators with a boiler of this kind, but a different type is required for a proper central heating system.

In addition to those illustrated there are many other excellent makes. Boilers of this kind are fitted with a hot plate on which kettles and saucepans can be kept hot. They have dampers i fitted in the stove pipe and over the air inlets beneath the furnace door. These are closed to retard the rate at which the fire burns ; by making it up and adjusting the dampers the fire will remain alight all night, thus providing a constant supply of hot water.

Boilers intended for hot water supply only are frequently placed in the cellar or in a basement. The sectional diagram (Fig. 5) shows such a boiler. It can be connected to an existing hot water pipe system and thus relieve the kitchener; but provision must be made for the removal of the boiler in the kitchener. The old flow and return pipe used in conjunction with the kitchener will, of course, be disconnected from the old boiler and connected to the new one. *See* Anthracite; Central Heating; Hot Water Supply; Radiator; Range.

BOILING: Of Food. Boiling is used for three distinct purposes. The first of these is to retain nutriment and flavour within the food, by preventing the escape of juices into the liquid, e.g. boiled meat or fish. This object is gained by placing the food into boiling liquid, and by a preliminary process of actual boiling for about 10 min. the albumen is hardened and seals up the nutritive and flavouring juices. The heat must then be sharply lowered, or the albumen all through the meat, poultry, etc., is also hardened, and the food made tough and tasteless. To prevent any possibility of this, casserole cookery, a slow process which ensures the retention of the natural juices, is often preferred for such foods.

The second object of boiling is to impart flavour and nutriment to the liquid, e.g. meat and bone soups and broths. To accomplish this result, the materials are placed in cold liquid, and allowed to soak for a time before heat is applied slowly till boiling point is reached. Boiling is continued till the ingredients have yielded their nourishment.

Boiling is employed thirdly to give part of the nutriment and flavour to the liquid, and partly to retain it in the meat, etc., e.g stewed chicken, Irish stew. This effect is produced by placing the food in cold water, and quickly heating it to boiling point, keeping it at that temperature for about five minutes and then lowering the heat to simmering point.

Boiling for the entire time of cooking is required for bone and meat soups; all green and most other vegetables; all boiled puddings, all starchy foods, e.g. flour in sauces; and for rice, macaroni, etc.

It should be noted that once the surface of liquid bubbles briskly, no amount of fuel will make it any hotter. The only result of furious boiling is that fuel and food are wasted.

Water in which meat, vegetables, rice, macaroni, etc., have been boiled should be used for stocks, soups, and sauces. *See* Beef; Chicken; Cookery; Pudding, etc.

Bokhara Rug. *See* Rug

BOLECTION MOULDING. In building work bolection moulding finds a place largely in the ing work bolection moulding finds a place largely in the panels of doors. Such mouldings rise above the face of the framing and are rebated over the edges, forming a narrow projecting ledge between frame and curved part of the moulding. *See* Moulding.

BOLERO. A very short jacket with open fronts, the lower edge terminating some inches above the waist. It periodically returns to everyday fashion, and is employed for Spanish or gipsy fancy dress being worn over a white blouse.

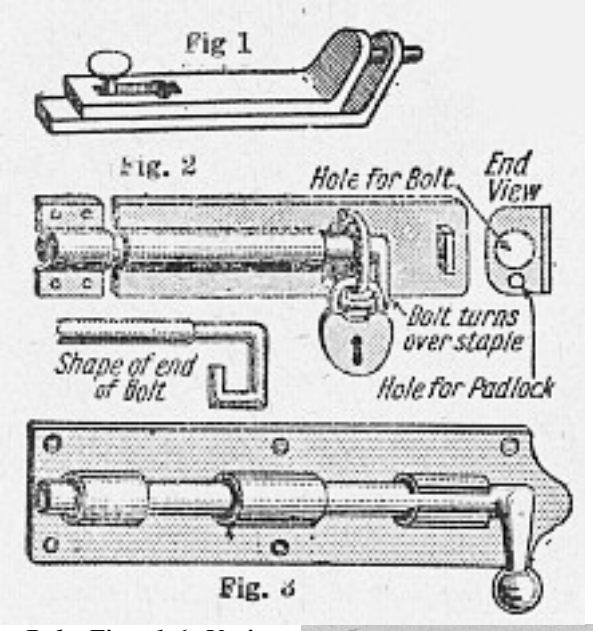
BOLSTER. Usually round in shape, it may be stuffed with feathers or with white horsehair. A variety for use with the large, square pillow is the wedge bolster. This is about 20 in. from back to front, deep at the back, the height about 5 in., and sloping to the front, where it is as thin as possible.

Upholstered like a mattress, a bolster should have a permanent under-cover, and a cover which is changed regularly in the same way as a pillow-slip. *See* Cushion; Pillow.

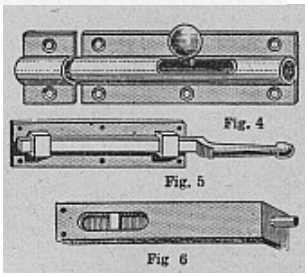
BOLT. For doors, cupboards, and similar purposes, bolts are made in hundreds of different sizes and styles. They have one object in common- to secure a movable part to some other part usually immovable. Essential considerations are security, efficiency, and neat appearance.

A few of the more useful types of bolt are illustrated, their principal uses being as follows:

Common japanned tower bolts (Fig. 3) are made in several sizes, from 4 in. to 12 in. long, and are used for outhouse doors and general purposes. They frequently shoot into a plain hole drilled in the doorpost.



Bolt. Figs. 1-6. Various patterns of door bolts in common use. See text.



Brass barrel bolts (Fig. 4) are made in sizes from 2 in. to 24 in. long for internal work, and are screwed flat on the door. Flush bolts (Fig. 6) are generally made in brass, with a sunk slide, in many sizes and widths, from 3 in. long by ½ in. wide to 24 in. long by 1½ in. wide. They are fixed to the edge of a door, and embedded by cutting a recess, and are frequently used on the one side of a double door.

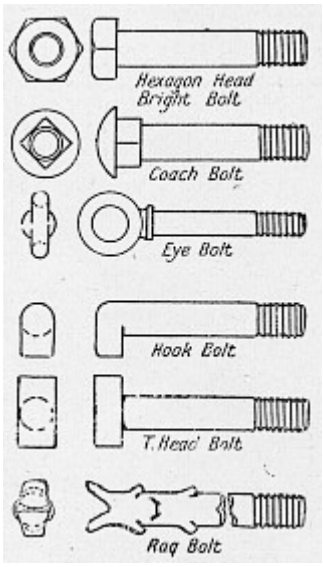
Blind bolts (Fig. 1) are made straight or necked, and extensively used on cabinet work, for doors of small cupboards, etc. They screw flat on to the door, and may shoot into a hole, through a brass plate, or into a socket.

Monkey-tail bolts (Fig. 5) are largely used for warehouse and garage doors. They are mostly about ¾ in. square, 12 in. and upwards in length. Padlock bolts (Fig. 2) are sometimes used on the outside of storehouse or shed doors, the bolt being locked to a staple with a padlock. Such bolts are usually galvanized to resist rusting.

Bolts seldom give trouble, the only things likely to affect them being the shrinkage or warping of the door, or the wear of the hinges, allowing the door to settle. This generally necessitates the removal of the staple or socket, plugging the old holes, and rescrewing.

Bolts fitted with stamped metal sockets sometimes work stiffly. They are generally corrected by holding a heavy hammer beneath the barrel and striking a few sharp blows with a light hammer on the upper part of the barrel or socket. This stretches the metal somewhat and makes more room for the bolt. The bolt should be shot into the socket while doing this, as it then presses on the tight spot; the jarring due to the hammer blows is transmitted to these tight spots, and they are thus stretched. *See* Latch; Lock, etc.

BOLT AND NUT: How to Use. In the general meaning of the word a bolt consists of a circular rod of metal having a solid head formed on one end, and screwed or threaded at the other end to receive the nut. The pieces to be held, or bolted together, are thus clamped between the head of the bolt and the nut.



Bolt and Nut. Various types commonly used in engineering.

Bolts are made in a wide variety of forms, sizes, and shapes, adapted to various purposes. The forms of the screw thread and its pitch, or number of turns to the inch of length, vary according to certain standards.

The ordinary black ironmonger's bolt with hexagonal head is used in all houses. The hole for it to pass through must be slightly larger in diameter than the nominal diameter of the bolt, as it is not machined to exact size.

British standard fine-threaded bolts, known as B.S.F. bright bolts, are extensively employed on automobile and aircraft work. This is a very strong bolt made of high tensile steel.

Engineers' bright bolts are machined all over, and hold up very closely to size Made with hexagonal head from superior grades of mild steel, they should always be used on machinery or any job where strength is a consideration.

Coach bolts, which are much used for bungalow work and poultry houses, have a rounded head and square portion on the shank immediately beneath the head to prevent the bolt turning round.

Eye bolts are so named because the head is formed as an eye or ring. Generally screwed Whitworth and made in the black and bright qualities, they are very useful for attaching a hook or fastening a line.

Hook bolts are serviceable when circumstances prohibit an ordinary bolt, as when temporarily bolting a plate to a girder.

T-head bolts are extensively employed on machine tools for bolting castings or other work to a faceplate or saddle.

Rag bolts are adapted to secure machinery to a concrete foundation, being inserted before running in the concrete.

Small bolts which are used for clockwork and model making are made in sizes from 1/16 in. to ¼ in. diameter, and are variously threaded. Model threads

are 40 t.p.i. (threads per inch). Whitworth model sizes are 40 and 60 t.p.i. B.A. threads are used on small-size bolts especially for scientific instrument work.

For all-round household work the regular black, hexagon-head bolts, or the coach bolts, ¼ in., 5/16 in., ⅜ in., or ½ in. diameter, and of appropriate length, will be found the most suitable and convenient. The length of a bolt is measured from under the head to the end of the shank. The diameter is the diameter of the threaded portion or shank. A coach bolt is driven home into wood with a hammer blow. The square part should be a tight driving fit into the wood. An ordinary bolt is screwed for only a part of its length, the usual length of thread being roughly three times the diameter. When a bolt is wanted with a thread all the way from the head to the end, it is known as a screw and should be purchased as a screw or set as a screw and should be purchased as a screw or set screw.

BOMBAY DUCK. A fish obtained in Indian waters, and exported from Bombay either in a dried and salted condition or in tins. Bombay ducks are usually crisped in a brisk oven for a few minutes, and served with curries. To powder these dried fish, crisp in the oven without burning, pound finely, and put through a strainer. *See* Curry.

Bonbon. This word is used forcertain large sweetmeats. *See* Cracker; Sweets.

BOND: In Brickwork. Bond is the name given to any arrangement of bricks so that the vertical joints in one row or course do not come exactly over or under a vertical joint in the next course. To ensure a satisfactory bond, the bricks must be uniformly arranged, have as few bats or partial bricks as possible, and the vertical joints or perpends in every other course must be above each other.

Several kinds of bond are in general use, the principal of these being known as English, Flemish, garden-wall, and herring-bone. The ordinary dwelling-house is usually built with English or Flemish bond. The names apply to certain recognized ways of arranging the bricks in the one brick or 9 in. thick wall, and the one and half brick or 13½ in. thick wall. *See* Bricklaying.

BONE. Grouped together as the skeleton, the bones of the human body form the framework upon which all the tissues depend. Bones are composed of chalky substance (carbonate and phosphate of lime) together with fibrous tissue. In youth the fibrous tissue preponderates and the bones are elastic to a large extent, whereas in old age mineral salts make up the bulk of the bones. Children's bones, therefore, tend to bend and yield under pressure, whereas the chalky bones of old age are brittle and break easily.

Inflammation may occur in the periosteum (the tough membrane that covers the bone), the bone, the bone marrow, or in all three. It may follow an open wound or be due to microbes brought by the blood, more especially after an injury. Hence superficial bones, like the shin or bone in the neighbourhood of joints, are specially liable. The inflammation may be acute or chronic. If the bone is denuded of periosteum the portion laid bare is likely to die.

Children who are run down, or who have some source of infection about them, such as a sore throat, are occasionally liable, after a slight injury perhaps, to a virulent and dangerous infection of the bone marrow of a long bone. The child looks very ill, highly fevered, perhaps somewhat delirious, and screams if some part of the bone, say, the lower end of a femur, is touched.

The importance of remembering this condition is that it is sometimes mistaken for acute rheumatism, and valuable time is lost. Dragging at the arms of small children is a cause of inflammation at the growing ends of the bones. The treatment of these conditions is surgical. *See* Arm; Fracture; Leg, etc.

BONE BLACK. A form of charcoal, prepared by heating bones at a high temperature in iron vessels from which air has been excluded. It is employed for bleaching sugar and also in the manufacture of blacking. The best kind, ivory-black, is made from waste ivory. In this variety the charcoal is in a very fine state of division.

BONE MEAL. This contains about 45 p.c. of calcium phosphate with about 5 p.c. of nitrogen. It is a useful fertiliser to apply to plants which are coming into full growth in the ordinary heated or intermediary house. It is a valuable stimulant, and is practically inodorous.

Bone meal is largely used, on account of the phosphates it contains, to promote growth in young chickens. It is often confused with green cut bone, from which it differs materially, the latter possessing a high nutritive value, and bone meal little, if any. *See* Chicken; Fertiliser; Poultry.

BONES: Use in Cooking. Clean, fresh bones contain a large amount of gelatinous matter, but this can only be extracted by quick and long boiling. It is quite easy to know when bones have yielded all nutritive and gelatinous elements, as they have then a spongy, perforated appearance and are of no further use.

Bone stock is a foundation for various soups. Poultry and game bones, which must not be the least high, and ham and bacon bones are especially valuable as flavourers. To make stock, wash 2 lb. of bones, removing the fat and marrow. Saw or chop into short pieces, and put in a saucepan with 2 quarts of cold water and a teaspoonful of salt.

Heat slowly until they boil, and remove any scum. Add 2 oz. each of cleaned and scraped carrot and onion cut in quarters. Do not peel the onion, as the skin will add colour and flavour. Boil the whole steadily for 4 hours, strain into a basin and leave until cold. The hard white fat that forms on the

top may be saved for dripping, for use with vegetables, etc.

For devilled bones select those with sufficient meat to afford a meal. Sirloin of beef bones or those from a roast saddle, or blade-bone from a shoulder of mutton are best. Mix together 2 teaspoonfuls of French and one of English made mustard, a teaspoonful of shopped chutney, ½ teaspoonful of strained lemon juice, with salt and cayenne to taste. Work all these into 1 oz. of butter. Spread and work this mixture well over and into the meat on the bones, and dust with a few browned crumbs. Place on a baking tin in a sharp oven until thoroughly hot, or they may be broiled. Serve at once with any of the melted mixture poured over them, and garnish with tufts of prepared and seasoned cress.

Marrow bones contain nutriment and make a savoury or lunch dish. Select large, fresh bones and have them sawn through if more than 3-4 in. long. Cover the end of each bone with a little stiff paste made of flour and water only, to prevent the escape and wasting of the marrow during cooking. Tie each in a cloth and boil from 1½ to 2 hours. Take out of the pan, remove cloths and paste, pin a clean napkin round each bone or half bone and send to table upright on a hot dish, with dry, crisp toast in a toast-rack. A long marrow spoon is used to extract the marrow.

BONING: Joints and Poultry. Some joints of beef, mutton and veal, e.g. breast of mutton, brisket and aitchbone of beef, and shoulder of veal, and also, on occasions, fowls, ducks and other birds, are boned before they are cooked, to lessen carving difficulty.

If a boning knife is not available, a sharp-pointed kitchen knife may be used, and should be slipped with a clean cut to the bone. Do not include in the joint any pieces of gristle, etc.. that might be left on the bone.

The secret of successful boning is to cut the meat as little as possible. In some cases, e.g. a shoulder of veal, the hole left by the bone can be filled with forcemeat. Such meats as pig's head and calf's head, and also sometimes breast of mutton, etc., are boiled whole until the bones readily leave the meat.

Fowls, turkeys and ducks may be boned and their original shapes retained, if so desired. To bone and shape a turkey, take one that is plucked and drawn, cut off the neck and loosen the skin from round it, pushing it well back. When the wishbone is exposed, detach it carefully from wings and breastbone. Divide the joints of the wings and clear them. The breastbone has next to be freed; detach the most prominent part carefully.

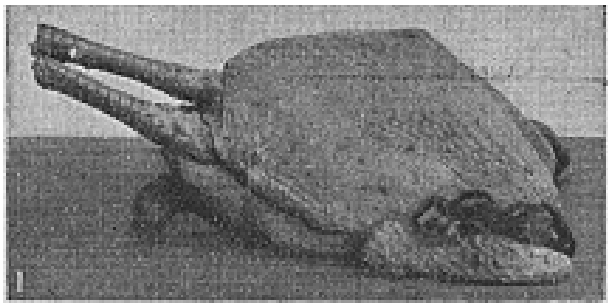
Roll back the meat over the part unboned, keeping the knife close against the bones. Detach the legs at the joints, and, after a little further work, the entire skeleton will come away. Then wash and dry the turkey. To bone the legs, the knife is worked gently round the bone, the thigh bone being removed whole. Continue until about half the drumstick is exposed, and then saw it off, leaving a little bit of the bone in to help to give the prepared turkey a more natural appearance. The small end bones of the wings are also left. For a galantine the end bones of the wings and legs are removed.

Turn back the meat the right way out. Fill the legs and wings with forcemeat, pressed tightly in until they resume their former shape. The trunk may be stuffed with forcemeat, or tilled with a cooked ox-tongue, the bend of it lying where the prominent part of the breastbone should be. The spaces left are stuffed with as much forcemeat as the turkey will hold. Work the turkey with the fingers until it has nearly regained its shape, tie securely in a buttered cloth, and it is ready for boiling.

A fowl boned in a similar way could be stuffed with sausage meat, the spaces being filled with mushroom, bacon, or other stuffing. Ducks are stuffed with sage and onion. To bone a bird that has already been cleaned, slit it down the back, and work round it from there. The back can afterwards be drawn together.

Our illustrations show how a chicken can be boned. In Fig. 1 it is represented as ready dressed, but an untrussed bird is dealt with in precisely the same manner. When trussed, remove the skewers and strings, reserving the liver, gizzard, extreme ends of the wings, and the feet up to the first joint.

To bone the chicken (Fig. 2), it should be held up on end supported by the left hand. Commence by turning the skin of the neck back over the breast and back until the shoulder bones of the wings are laid bare. Divide each joint as in the photograph and scrape the bones of the wings quite clean, removing the wing bones from the carcase.



Boning a Fowl.
1. The bird ready dressed for boning.
2. Skin of neck turned back to lay the shoulder bones bare.



The flesh of the body must now be removed carefully and cleanly with the boning knife down towards the thighs, and must be scraped off the breast bone without breaking the skin (Fig. 3). Divide the thigh joint as shown, scrape the bones quite clean,

breaking them at the joints, and remove them also.



3. Dividing the thigh joints.



4. Removing flesh from breast-bone.

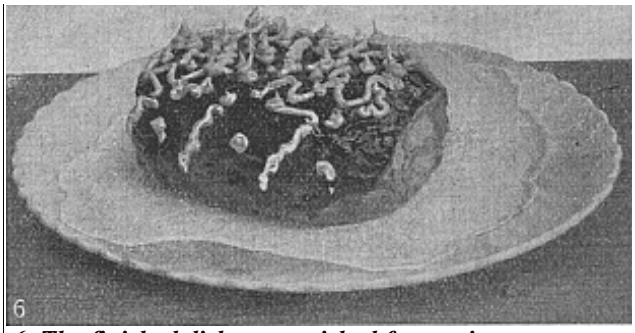


5. Flesh spread over with stuffing of hard-boiled eggs, bacon, sausage-meat and mushrooms, before being rolled up for cooking.

Now proceed, as shown in Fig. 4, to remove the flesh entirely from the carcass. Cut off the "parson's nose," turn inwards the flesh of the wings and legs, and trim off the rough edges of the neck.

Arrange the flesh evenly over the surface of the chicken. Spread carefully 1 lb. of sausage meat flavoured with ¼ lb. of chopped mushrooms, 3 oz. of bacon, cut in fingers, and a hard-boiled egg, sliced. Arrange it as shown (Fig. 5) and roll it up neatly, but do not sew the edges together. Tie it in a cloth like a roly-poly pudding, and it is ready for cooking.

The finished dish is shown in Fig. 6. Remove the cloth, rinse it out in hot water, and tie the chicken up in it, tightly shaping it. The bird should then be pressed between two dishes and allowed to cool. *See* Beef; Breast; Chicken; Fillet; Garnish; Stuffing.



6. The finished dish as garnished for serving.

BONNET: Of Motor Car. The bonnet's seating, both on the dash and the radiator, is threaded through holes with a strip of some soft material. Should this be hard, which is more than likely, through the ingress of oil and dirt, replace with new.

A frequent cause of noise is due to the bonnet butting up against the seatings, thus giving the impression that it is too long. This is seldom the case, the fault usually being in the radiator, the holding bolts of which have become loose, allowing the radiator to vibrate. These should be tightened.

Where a top centre hinge is employed see that it is firmly secured at each end. Finally, a little very thin oil worked into the hinges will cure a lot of puzzling noises; the same applying to bonnet fastenings. *See* Motor Car.

BOOKBINDING FOR THE AMATEUR

How to Repair and Rebind One's Books

The article on this subject is one of a group that describes hobbies which can be taken up with advantage by the amateur. See Leather Work

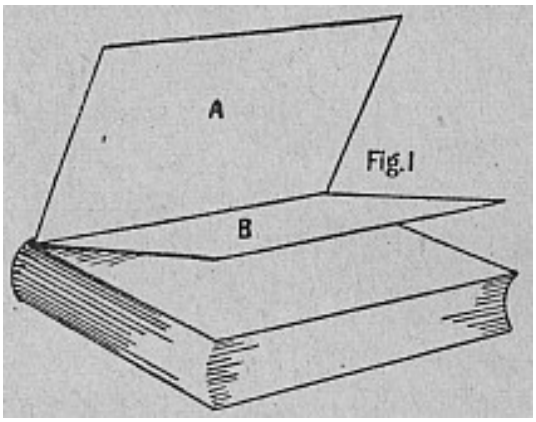
Simple bookbinding may be done at home with a few tools and appliances, and the handy man can improvise or make for himself many of those required. The tools needed are as follows:

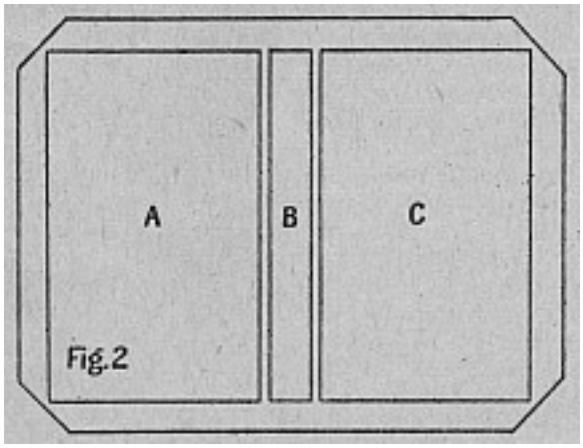
1 laying press	1 sewing frame and keys
1 pair backing boards	1 backing hammer
1 pair cutting boards	1 paring knife
1 pair pressing boards	1 bone folder
1 pair pressing tins	1 knocking down iron

To these may be added others likely to be in the amateur's tool box, i.e. a small tenon saw, a square, and a glue pot. A paste-pot will be needed also. The bookbinder uses a small "tub" for this purpose (Fig. 8), a rectangular wooden box having fixed across it at one end a wooden strip on which to rub out surplus paste from the brush. Glue and paste brushes should be the proper ones made for the purpose. They can be obtained, together with other requirements of the amateur bookbinder, from the firms which specialise in these goods.

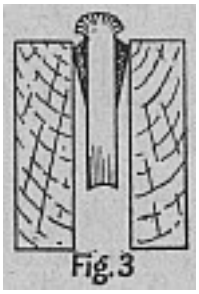
Since the cutting of book edges presents some difficulty to the amateur, and is done by machinery in a fraction of the time taken by the old-fashioned

method, it is suggested that the local bookbinder be asked to trim the edges of any books which require this treatment. If this course is adopted the amateur will not need the tool called a plough, which is used, in conjunction with the laying press (Fig. 8), to cut book edges by hand.

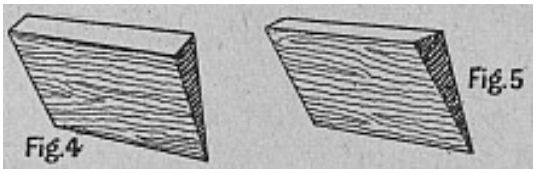


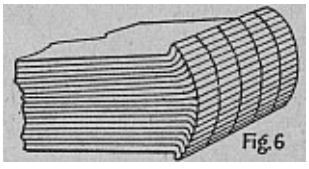


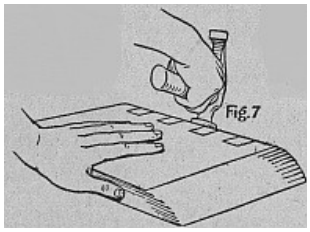
Bookbinding. Fig. 1. New end papers, A and B, tipped on to the first section. Fig. 2. Making a new case; A and C, boards; B, strip of manilla paper.



Bookbinding. Fig. 3. Section showing book being backed.
Fig. 4.Backing board
Fig. 5. Cutting board
Fig. 6. Book after backing.
Fig. 7. How book is rounded.







We will commence with a cloth bound book which has come out of its cover, and is otherwise in fairly good order. Dealing first with the cover, remove any loose portions of the end papers and any hard glue adhering to the back. If the corners have been telescoped they can be carefully hammered out flat. The back of the case may be repaired with pieces of binding cloth of the same sort and colour as the original. Should the back be damaged beyond repair, a new back may be made from a strip of cloth. The new back must be cut wide enough to allow an overlap on each side, which is glued and pressed between the edge of the old cover and the board.The edge of the old cover fabric must be rubbed down with a bone folder to make a close joint, and the case can then be put aside in a press, or under a weighted board, to dry. An old copying press, often to be picked up cheaply, would be very useful to the worker.

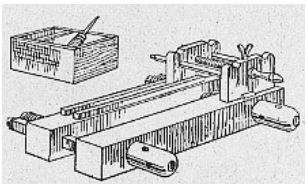
A new case is easily made, the old one serving as a gauge for size. If the old boards are usable, the measurements of the case should be observed before stripping, and a piece of binder's cloth cut to the size, allowing an overlap all round for turning in. If new boards are necessary, strawboard of the appropriate thickness should be obtained and carefully cut to size with a sharp knife and a metal straight-edge. A piece of stiff paper is glued to the back, leaving a space between the boards and paper strip. Fig. 2 will make this clear.

The cloth is glued out and left for a minute, when the left-hand board, A, is placed on it, leaving the correct margin for turn-in. The manilla strip, B, is then placed on the cloth, and finally the right-hand board, C. The positions might be marked on the cloth by pencil lines before glueing. Turn in the edges, rubbing the cloth down with the folder. It will be noted that the point of the board comes a little within the diagonal edge of the cloth, just leaving a little cloth to form a fold when the edges are turned over the board. The cover is then turned right side up and the whole surface rubbed down well with the folder. If the glue is hot and in proper condition there will be a smooth surface and no bubbles.

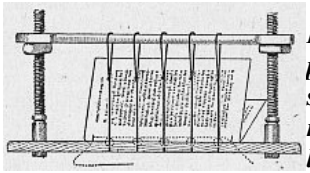
The book itself must now be dealt with. New end papers will be needed, and perhaps the strip of mull which held the back to the covers has come away. The mull may be pulled off and replaced by another strip, but if the sections are loose or some of the stitches are broken, this must be attended to first. The sections of a book are sewn through the fold from the centre, each section being also caught to the next. Ordinary books are machine sewn, the better-class work being sewn to tapes or cords. The methods adopted for hand-sewing books are shown in Figs. 9 and 10. The latter explains the process of sewing on tapes.

Make new end papers by cutting a sheet of stout white paper twice the size of the book page and folding it in the middle (Fig. 1, A, B). This is pasted at the fold and tipped on to the first section of the book. The end papers for the final section are made and fixed in a similar way. Any torn leaves in the book

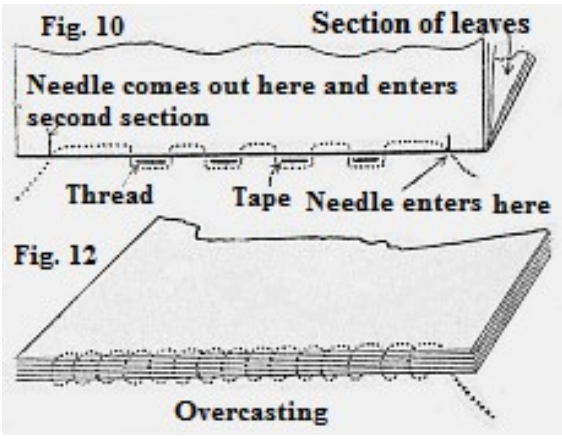
may be mended with paper resembling that of the original. The old end leaves will furnish paper for patching or mending, and gummed transparent mending paper may be utilised. Loose plates should be tipped with paste and carefully replaced.



Bookbinding. Fig. 8. Laying press, showing plough for cutting book edges; (above), paste tub.



Bookbinding. Fig. 9. Sewing press, showing the method of sewing on cords. Path of needles indicated by dotted line.



Bookbinding. Fig. 10. Sewing on tapes; path of needle shown by dotted line. Fig. 12. Method of overcasting single leaves.

After any loose sections have been dealt with, and new end papers attached, the back should be glued up. Place the book in the press between boards, and work thin glue well into the back. When the glue is dry, but not hard, the book may be rounded. Fig. 7 shows how this is done. Place the book flat on the bench, front edge towards you. With the four fingers of the left hand stretched across the side and the thumb pressed into the front edge, pull the thumb and fingers towards each other, at the same time hammering the back of the book towards you. Turn the book over and repeat the hammering. This will force the sections forward on each side, and the book will now be perfectly flat with a round back, instead of being wedge-shaped with a flat back as when first sewn (Fig. 11). The threads used for sewing do not now fall exactly over one another, and the increased thickness or sewing swell is thus reduced (Fig. 10). (These illustrations show a book which has been sewn on cords. In good class work the ends of the cords are laced through holes in the boards of the cover. The cloth or leather cover is then made on the book itself.)

Place the book between backing boards in the laying press back outwards. The top of the backing boards should be about the same distance away from the back edge of the book as the thickness of the cover boards (Fig. 3). Screw up tightly and hammer outwards from the centre to form a groove into which the cover boards will fit. Care must be taken to keep the round true, as near as possible the third of a circle (Fig. 6).

If the back of the book was in fairly good order it will not have been necessary to re-sew sections or to round and back the book. Glue up the back and line it with stout paper, rubbing down the lining after a while with a folder. When dry, glue up again and place on the back a strip of mull about 1½ in. wider than the back, leaving unglued the overlapping portion, which is pasted down to the covers when casing in the book. The book is then placed aside to dry.

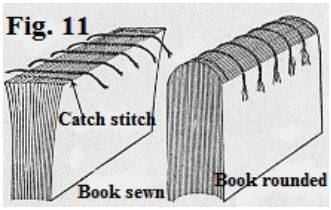


Fig. 11. Book sewn on cords, showing catch stitch between sections: Left, after sewing; right, back rounded.

To insert the book into its cover, the front end paper, together with the overlapping portion of the strip of mull, should be evenly coated with thick paste and the book laid carefully on to the cover, seeing that the "squares" (margins) are equal on head, tail and fore-edge. Next paste the other (back) end leaf, which will now be uppermost, and leave it for a minute. Then hold the book with the right hand between its leaves, and bring the cover over on to the book with the left hand, watching meanwhile to see that the margins are even and equal to those of the front cover. The book must be placed between pressing boards and left overnight in the press. The back of the book should protrude from between the boards and the edges of the latter should be close up to the backing ridge.

The title of the book could be printed, typewritten, or neatly written on a paper label, this being pasted on to the back of the cover. If gilt lettering is wanted the local bookbinder would title the book for a small charge. Fig. 12 shows a method of over-sewing single leaves to form a section. In the illustration of a sewing frame (Fig. 9) a section is shown being sewn to cords, a method adopted for better-class work.

BOOKCASES AND BOOKSHELVES

Fittings to Make or Buy for House or Flat

Here is shown how accommodation for the books of the household can be provided at small cost. For information on the Carpentry details involved see Cabinet Making; Joint; Mortise; Tenon; Wood, etc.

The shape and size of a bookcase must vary according to the space available for its accom-modation. Those most usual in houses of moderate dimensions are made to fit the recesses on each side of a fireplace, or to rest against a wall. They should have the advantage of light, without the disadvantages of strong sunlight or

appreciable heat from coal or gas fire or hot-water pipes. The golden rule is to make the bookcase for the books. Any ornament should be of the simplest kind, and the shelves should be movable, so that the books can be placed upon them according to their size.

Sectional bookcases on the unit system are useful in this respect, and possess the advantage of being easily moved and added to. On the other hand, their appearance is not so decorative for a drawing-room or in association with period furniture as shelves well placed in niches or recesses, or bookcases of the Chippendale style (q.v.). Space saving is so necessary in many homes that bookshelves are often added to built-in corner seats, above the padded backs; or low bookcases form separate and yet composite parts of a divan sofa, made in three sections, with upholstered centre and the two-shelved bookcases at either end, painted to suit the woodwork of the room or made in oak, walnut or mahogany.

The total height of the bookcase shown in Fig. 1 is 4 ft. 3 in., the width 2 ft. 10 in., and the depth 10½ in. The bookcase portion has three spaces, and will hold from 60 to 70 volumes of crown 8vo or demy 8vo size. For a living-room bookcase oak will look best, or American whitewood will serve if it is stained to the colour of one of the hardwoods.

The ends, Fig. 2 (A), may finish ⅞ in. thick. The upper part is cut back with a simple shaping, and the lower parts may be shaped as indicated if the cabinet is not to stand in a recess. Both ends are dovetail-grooved to take the cupboard top and bottom, the grooves being stopped about ¾ in. from the front edge in order that the joint will be hidden. The back edges may be rebated for the upper and lower backs.

The cupboard bottom (B) and top (C), like the ends, should finish ⅞ in. thick. They are dovetail-housed to the ends, and the front edges will be cut back to correspond with the stopped grooves. At front the edges are flush with those of the ends. The back (D) is indicated as three-ply, but may be matched or framed according to the use to which the cupboard portion is to be put. The shaped rail (E) below the cupboard bottom stands back about 3/16 in. It may be dowelled on, or glued with angle blocks behind.

The upper shelf (F) is shaped as shown in the plan, and is plain housed to the ends. If the upper back (G) is made in two parts the shelf may be cut ½ in. wider than shown, in order that it may go right to the back. The small brackets (R) stand in ⅛ in., and are fixed with small glued blocks.

On the section the upper back (G) is shown in one piece. If preferred, it may be in two parts, the upper portion being dowelled to the shelf (F). If in one piece, or if jointed (the joint coming behind the shelf), ½ in. wood may be used, in this case, H is a ¼ in. pilaster, planted on, and J J are two moulded slips, 1½ in. wide by ¼ in. thick, planted on to form a kind of plinth. If it is preferred to have the upper back divided, the wide portion between the shelves might be (a) framed up with a long mirror, or (b) framed to form two panels as indicated, or (c) it might be a solid board with a small mould (S) pinned on to form panels. The ends, which are 5½ in. wide at the top, are rounded off to the section shown.

The doors (M and N) should not be made till the carcase is otherwise complete. They are framed up of stiles and rails 2 in. by ⅞ in. and are shown without a mould. The astragal (O) should be quite plain if the doors are made to the section shown. Inside shelves (P)

	Long in.	Wide in.	Thick in.
2 ends (A)	51	11	⅞
Cupboard bottom (B)	33	10½	⅞
Cupboard top (C)	33	10½	⅞
Back (three-ply—D)	30	33	5/16
Shaped rail (E)	33	2	1½
Top shelf (F)	33	5½	1½
Upper back (jointed—G)	33	15	½
Pilaster slip (H)	10½	1½	¼
2 back slips (J)	16	1½	¼
4 door stiles (M)	28	2	⅞
4 door rails (N)	16½	2	⅞
Astragal (O)	28	⅝	5/16
2 inside shelves (P)	32½	9½	¾
2 shelf brackets (R)	5	2	½
Panel mould (if used—S)	72	⅜	¼

are ¾ in. thick, and may be hung on fillets or on studs.

In the cutting list given above the lengths and widths allow for joints and paring, but all thicknesses are net. If the upper back (G) is cut in two pieces, the lower one will be 10 in. wide and the upper one 2½ in. *(See also page 219)*

Making a Set of Bookshelves. A set of book shelves which are suitable for a narrow recess at the side of a fireplace; or the return corner of a room at the window end, is shown in Fig. 3. The addition of a small cupboard below adds to its usefulness. Additional wide shelves may replace this, if desired. If other furniture has to be matched, oak or other hardwood may be used, but for ordinary purposes American whitewood will do.

The cutting list is as follows, lengths given allowing for joints, but all thicknesses are net.

	Long ft.	Long in.	Wide in.	Thick in.
2 uprights	6	2	8	⅞
2 extensions for ditto	2	7	3	⅞
Top	2	9	9½	¾
Cupboard top	2	5	11	¾
Cupboard bottom	2	5	11	¾
Cupboard shelf	2	5	10	¾
4 shelves	2	5	8	¾
2 rails	2	5	2	¾
4 door stiles	1	6½	2	⅞
4 door rails	1	3	2	⅞
2 door panels	1	3	11	5/8
Back (matched) about 15 ft. super.				

The sizes given on the scale drawings in Fig. 4 are necessarily suggestive. A carcase width of 2 ft. 6 in. is useful for the narrow recess, but this could be slightly

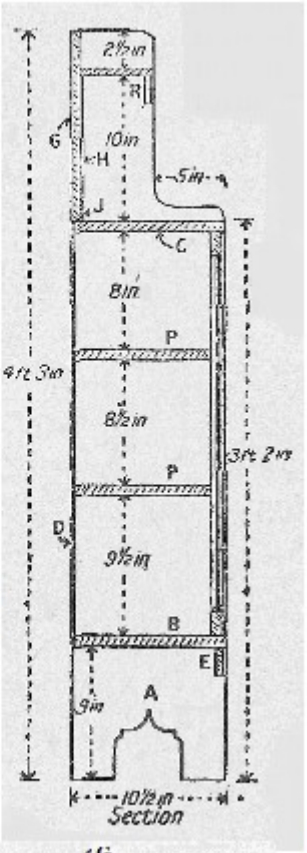
(*Continued in page 221*)

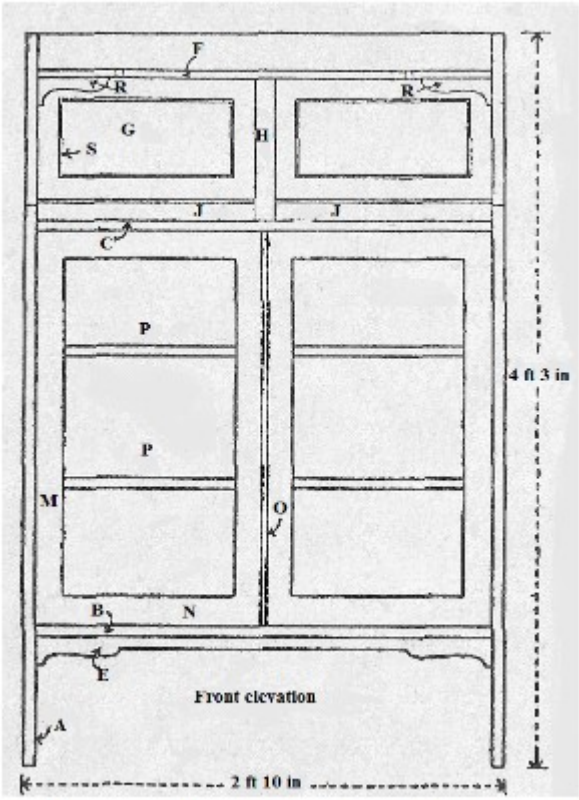


Fig. 1. Cabinet made to fit in recess.

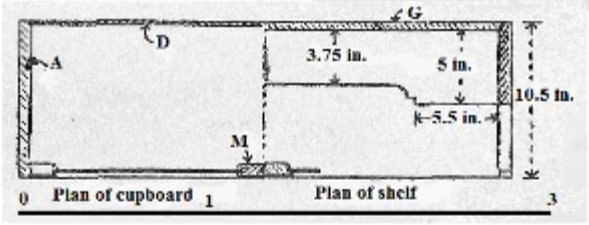
BOOK CASE

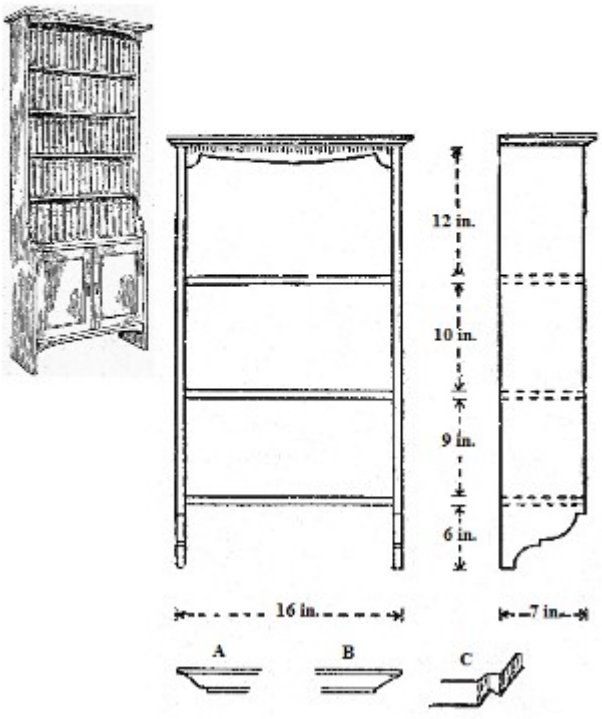
Right. Fig. 2. Front elevation, section and plan, below.

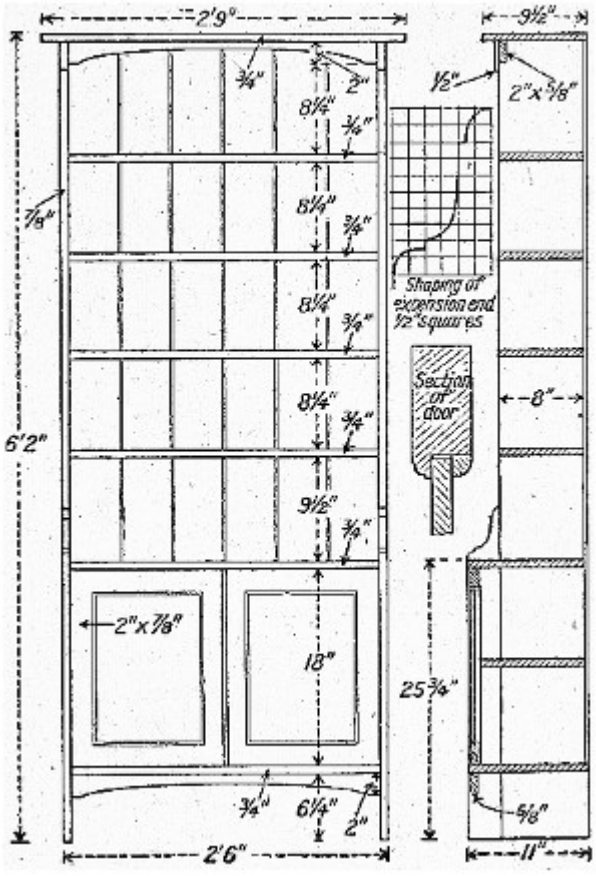




Bookcase. Below. Figs. 3 and 4. Set of shelves with cupboard which can be made by the amateur woodworker.





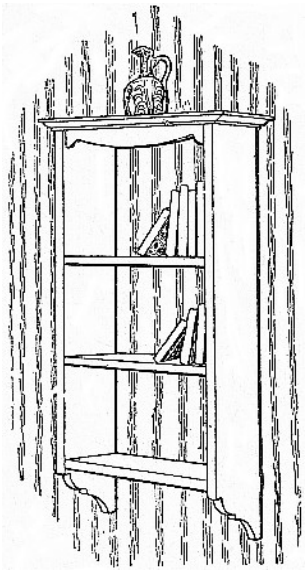


increased or reduced to suit requirements.

The uprights (about 6 ft. 2 in. long) are 8 in. in width, but widened by glue-jointing to 11 in. for the lower part. The added portions are shaped at the top, and at the extreme top of the uprights a little piece is glued on to give a break. The uprights should be dovetail-housed to the top, shown 9½ in. wide.

The cupboard bottom and top and the top shelf should be dovetail-housed to the uprights, the housing being stopped in each case to mask the joint. The other shelves may be housed, or fitted on fillets or secured in position with bookcase pins. The shaped rails below the bookcase top and the cupboard bottom may be glued on with angle blocks behind. The doors are framed of material 2 in. wide by ⅞ in. thick, with or without a mould. The inside cupboard shelf, fixed or adjustable, will act as a door-stop.

When shelves have to be fitted into a recess, and no screws or nails may be driven into the wall, a good plan is to provide two uprights of flat board as wide as the shelves, one for each side, or alternatively two narrow uprights, about 3 in. by 1 in., for 9 in. wide shelves, for each end. If the shelves are not to be adjustable for distance apart, it only remains to cut grooves in the uprights at the desired levels. An alternative method, avoiding the need of wedging between the wall and the upright, is to cut two or more shelves so that they have projecting ends that pass through slots cut in the uprights for that purpose. These are then secured with wedges driven through slots in the projecting ends of the shelves.



Bookcase. Fig. 5. Light hanging shelves.

Fig. 5 shows a hanging bookshelf. The shaped part of the ends shown in the elevation is cut out with a bow saw and carefully cleaned up to a smooth finish. The ends are then marked out, and the dovetail grooves cut so as to receive the ends of the shelves, which are cut as at C (Fig. 6).

The front and ends of the cornice board should have their edges moulded, as shown at A or B. The moulding at A is worked with a moulding plane, but those who do not possess a suitable tool could easily cut the moulding shown at B, which would be almost as effective. The shape cut at B would be worked as follows: Mark the work as deeply as possible with a cutting gauge, and plane roughly to shape with a jack plane; then work away the square or fillet with a tenon saw and chisel, pare up, and glasspaper to a finish. It will greatly facilitate the working of the moulding if the glasspaper is wrapped round a small piece of wood about 2¼ in. long by 1 in. by 1 in.; there will then be little or no tendency to rub the flat or chamfered portion of the moulding out of shape.

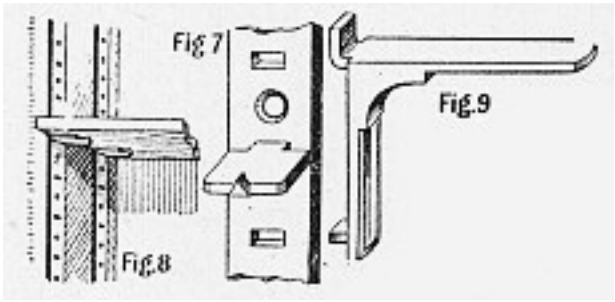


Fig. 7. Slotted strip for adjustable shelving. Fig. 8. Strip, with supporting studs. Fig. 9. Bracket used with this system. (Hill & Cozens, Ltd.,)

Assemble the parts as follows: Glue to the grooves which are cut in the ends, and fix in the three shelves; glue, nail, and screw the cornice board, and allow the glue to harden; cut the shaped piece, and glue and screw it to the cornice board. If the screws be put in from the top of the cornice, the method of fixing in the shaping will be concealed from view. Three coats of suitably coloured enamel will make a good finish.

Ends, shelves and cornice board are of canary wood, ⅞ in. thick; they should be kept as thick as possible but planed out of winding. The shaping, also of canary wood, ¾ in. thick, is screwed in position from top of cornice board with 3 screws, 1½ in. long by 10 or 8 gauge. The cornice board is fastened to the ends with 4 screws 2 in. by 10 gauge and 4 oval nails, 2 in. long. To fix the bookshelf to the wall, 3 brass ear plates are required; 2 ear plates are fastened to the cornice board and 1 to the centre of the bottom shelf.



Bookcase built up on the unit system from boxes with and without doors, made by Venesta, Ltd.

Movable Shelves and Portable Shelving. When a large number of books is to be provided for, and perhaps the whole side of a room will be taken up with the shelving, the system described below is suitable. The sides and any intermediate uprights are 1¼ in. by 8 in. or 9 in. boards, and the shelves are 1 in. thick. Oak is very suitable for the purpose. A pair of uprights are connected by a base at the bottom and a cornice at the top, these being of the length selected for the shelves. Angle brackets and screws are used to fasten them to the uprights. Slotted brackets can be obtained which permit the removal of the base or cornice by just slacking off the screws, which need not be entirely unscrewed. Two grooves are ploughed in each upright to take narrow metal strips (Fig. 7) pierced with rectangular holes about an inch apart. The strip lies in the groove flush with the face of the wood, and is secured by screws.The shelves are supported on steel studs which fit into the holes in the strip. The strips are sold in lengths of 6 ft., but can be had in special lengths at a little extra cost. Iron brackets from 2 in. to 6 in. wide are also made for use with the bookcase strip (Fig. 9). In making up shelving on this system it is imperative that the strips on each of the uprights should be the same height from the floor line. Intermediate uprights will be grooved and fitted with iron strips on both faces, since they support two sets of shelves.



Bookcase. Set of shelves, so contructed that each shelf can be adjusted to the height of the volumes it is intended to bear. (Courtesy of Country Life, Ltd.)

BOOK COVER. Spread the book open on a piece of material, holland, linen, brocade, silk, etc. Mark where the edges come, and cut a rectangle, leaving 1 in. for the turnings at top and bottom, and nearly the width of the cover extra at each side. Turn these side-pieces over the cover boards, and shut the book to make sure there is enough play for the back. Then remove from the book and stitch down the loose side-pieces at top and bottom. Also turn in a narrow hem along their loose edges, and along the unstitched part of the top and bottom.

Turn the cover the other way out, and slip the cover boards of the book into it. The title can be written on the cover in coloured Mandarin ink, or embroidered, if of silk or brocade, but this must be done before it is put over the book.

A temporary cover can be made of stout brown paper cut out similarly to the cloth cover described above.

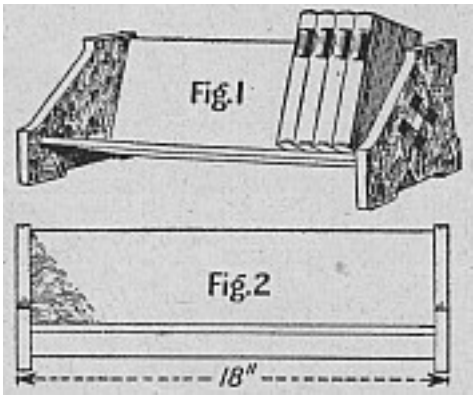
BOOK ENDS. These are more decorative for a few books on occasional or writing table in living-room or bedroom than the ordinary book rest, as they may be obtained in brightly-coloured pottery, tinted plaster, marbles, painted and lacquered wood and heavy glass. Weighted wooden ends are covered in embroidery on canvas and in raffia work. *See* Pottery; Raffia.

Book Keeping. This is not widely employed in the household, but there the keeping of accounts is desirable. *See* Accounts.

BOOK MARKER. The simplest is a piece of ribbon, a little longer than the book itself, glued to that part of the binding where the pages are stitched together. A metal clip marker combines a page cutter, or a separate ribbon marker may be weighted either end with a tiny metal figure or animal.

BOOK PLATE. A printed label which can be pasted inside the cover of a book to mark its ownership, a book plate may be specially designed and an elaborate production blazoned with coat of arms or some fanciful design, or a simple form with the owner's name. The earliest existing examples date from the early 16th century, and these, as well as fine specimens of workmanship of the 17th and 18th centuries, are collected by some people as a hobby.

BOOK REST: How to Make. A book rest or book rack differs essentially froma bookcase or bookshelf in that it is mainly used for holding books which are constantly in use. It is generally designed so that the books are tilted at a convenient angle for quick selection.



Book Rest. Fig. 1. Tilted book rest suitable for a study table or writing-desk. Fig. 2. Front aspect.

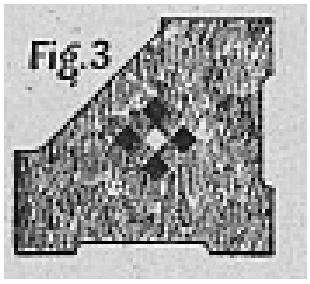


Fig. 3. End of book rest inlaid with black and white check pattern.

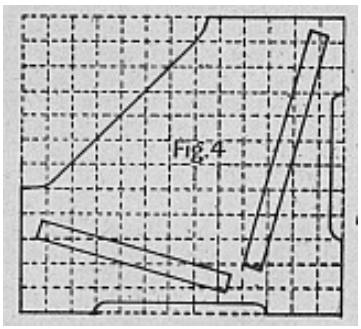
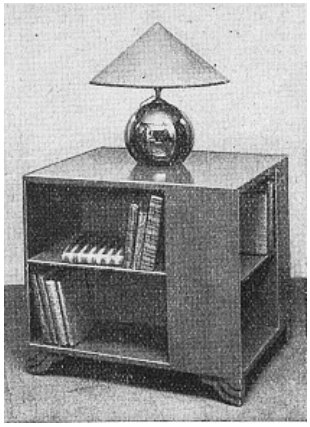


Fig. 4. How the shape of the ends may be transferred: the squares indicated represent each half inch.

The book rack shown in Fig. 1, which is made with two ends, a back and a bottom, could be carried out in oak, in which case the ends may be inlaid with a black and white pattern, as shown at Figs. 1 and 3. If this plan is adopted, the rack should be fumed fairly dark and waxed, and the inlay could be ebony and holly. Mahogany and walnut are also suitable woods.

The ends, which are 6½ in. wide by 6 in. high, are cut from ½ in. material with the grain running from top to bottom. The shape may easily be transferred from Fig. 4, if the squares indicated in the illustration represent each ½ in. The back and bottom should be 1 ft. 5 ½ in. long, the former being 6 in. wide, and the latter 4 in., while a thickness of ¼ in. will be found sufficient. The back and bottom are simply housed ¼ in. into the ends in the positions indicated at Fig. 4. The joints are cut to fit fairly tight, and are glued.



Book Table in polished oak. It has shelves on every side and is admirable for the lounge.

BOOK TABLE. This space-saving piece of furniture takes the place of a revolving bookcase, having shelves on every side to accommodate books and periodicals in use, and is also a convenient occasional table. It has the advantage of being solidly made and perfectly steady for a reading lamp or tray of glasses, etc. *See* illustration above.

BOOTS: USEFUL HINTS ON CHOOSING

How to Recognize Good Footwear and to Preserve it in Use

Related articles are those on Boot Polish; Boot Repairing; and Leather. See also Brown Boots

When buying a pair of boots, to the casual eye the cheaper boot, nicely treed up, well stretched to take out all creases, and then carefully polished, will not present much difference from one at perhaps double the price; but close inspection will reveal the greater smoothness or velvety feel of the grain if of a high grade box-calf, which will be found to give greater satisfaction in wear, and to retain its appearance longer than the cheaper boot made from a lower quality coarser skin, or perhaps from box-hide, which can usually be recognized by the absence of grain marking, and the harsher surface when the hand is passed over it, making it more liable to crack in wear. The higher grade box-calf has distinct grain markings and is beautifully supple.

The finish of the boot should also be regarded, the neatness of the closing of the uppers, the exact regularity of the stitching to the vamp or golosh, the perfect insertion and alinement of the eyelets, and, above all, the quality of the leather of which the tongue is made and the way it is attached to the inside of the opening. A cheap boot often reveals itself in the tongue, being of very poor, rough stuff carelessly fastened into the inside of the front.

The lining of the boot should be examined, and, whether of linen or leather, this should fit without wrinkles. Then the fingers should be passed down towards the toe. If there is a crease in the toe, where the lining has been badly lasted, and this is quite a common fault in a cheap boot or shoe, it will cause constant trouble in wear from the first day. The looseness of the lining will form a hard ridge, which will rub blisters across the toes. At the heel, the fit of the stiffener inside should be noted. If on passing the fingers downward the edge of the stiffener is plainly to be felt, then it can usually be anticipated that the friction of the wearer's heel will rub a hole in the back lining very quickly, and a blistered heel will probably result.

If all these points are satisfactory and the boot fits closely to the foot when the wearer stands up and puts his weight upon it, without painful compression of the big-toe joint or cramping of the toes, then, whether the boots are cheap or expensive, it may safely be assumed that comfortable wear will result, and as much durability as the purchaser has a right to expect.

In buying patent leather shoes it is well to choose the best, although even the best patent-colt or patent-calf cannot be relied upon to wear without cracking in spite of many attempts to produce a patent leather that will not crack; but cheap patent, which is often not leather at all, but American cloth, is certain to become cracked in wear and quickly to lose its smart appearance. It is all the more important, therefore, to see that the finish of the inside of the shoe is all that it ought to be.

Owing to the hard enamel surface patent shoes will not stretch in the least degree. They are also airtight. When the foot becomes warm and swollen there is no possibility of the shoe stretching, and thus the hot foot, prevented from swelling, becomes cramped and still hotter through lack of ventilation which ordinary leather affords.

A glacé kid boot is sometimes made with a patent leather cap, and to preserve the surface of the patent this cap is rendered unbreakable with a toe-puff or case of hard leather, stiffened canvas, or compressed fibre inside. This looks smart at first, but in wear the flexible glacé has a tendency to crease in the same place

every time the foot is bent, exactly where the stiff toe-cap finishes, and very quickly an unsightly crack develops.

Leather which is Waterproof

In regard to the soles, it is difficult to tell the quality of leather used, as the leather is scraped, and what is called fake applied to it, either black or brown. This applies to vegetable tanned leather. Chrome tanned sole leather can be distinguished as it is always left in its natural green colour. This leather is absolutely waterproof, and in the best tannages is far more durable in wear than even the best quality oakbark-tanned. While chrome is watertight, it is also airtight, and is not recommended if the wearer has hot feet.

It will be found the truest economy to have two or three pairs of boots in use at the same time. After being worn for a day, the boots should be placed on a pair of trees. If wet, they should not, in any circumstances, be placed near a fire, but should be laid on their sides in a dry place, and not with the sole to the floor, so that the wet sole can dry in the air. When boots have been thoroughly soaked, an excellent plan for drying them before putting on the trees is to fill them with sawdust that has been well dried. This absorbs any moisture that may have soaked through; and if the sawdust is tightly packed, it swells as it absorbs the moisture and keeps the uppers nicely stretched as they dry. When the boots are dry the sawdust can be shaken out, and after being dried in the oven, this can be kept for further use.

The boots should then be placed on the trees and well polished. The uppers of wax-calf or kip should be treated with dubbin in wet weather, and chrome uppers can be treated with a dressing of glycerine. This will help to resist the damp, or if it is not applied until after the wet boots have been dried, will keep them supple. Before being polished, either with wax polish or other suitable blacking, according to the character of the upper leather, the surface grease should be carefully wiped off or a good shine will not be obtained. Wet soles will be found to dry hard and present a shrivelled appearance. An application of glycerine well rubbed in will not only restore the nature of the leather, but will render the soles more watertight when again worn, and prolong their life.

A hot water pipe has ruined more good boots than the wearers have ever dreamed of, the subsequent rapid deterioration of the boot being attributed to poor quality leather or faulty workmanship. Leather scorches and perishes if subjected to heat. The damage is not noticed at the time; but when the boots are again worn, the perished brittle leather cracks and crumbles away.

How to Determine the Fit

The fit of the boot is determined across the joint over the crown and the arch of the instep and the heel. From the joint backward the boot should fit snugly like a well-fitting glove, but there must be plenty of room for the toes.There must be no looseness in the heel, but this will be kept quite snug by the fit of the joint. There can be no greater mistake than to have the toes fitted. The ideal is close heel, well-fitting joint and instep, and leave the toes plenty of room to look after themselves. In walking the weight of the body is put on to the foot, and is transferred to the toes as the heel leaves the ground. If there is no room for the toes to spread naturally under this transference of weight, the result is cramp, discomfort, and pain, with eventual corns and foot trouble generally.

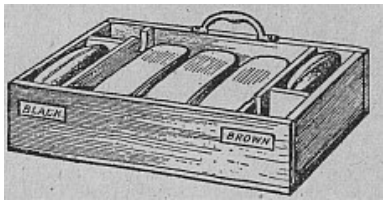
Leather improves with keeping, and it is a good plan to buy boots several months before they are worn. They should be stored in a dry cupboard and occasionally cleaned. A little vaseline round the edges of the soles from time to time will add to the durability. A varnish dressing which produces a shine without rubbing or brushing is injurious to the leather. Polish cannot penetrate when applied over such a varnish, and polish, which helps to preserve the leather, cannot do so unless it penetrates it. When shoes are varnished it makes them impervious to the perspiration of the foot, which is absorbed into the leather itself and gradually rots it.

Chrome upper boots or shoes (box-calf, willow-calf, dull chrome, glace kid) should never be cleaned when damp. The best makes of polish only should be used. Vegetable tanned uppers, wax calf, waxed kip or split, such as farm boots, etc., may be kept soft by rubbing in nightly dubbin, neat's- foot oil, or tallow.

BOOT BRUSH. Owing to the improvements effected in leather polishing preparations the old method of boot-cleaning has in many homes completely dis-appeared; but for preparatory cleaning from dust or mud the boot or shoe brush is still a necessity. Pure bristle is the cheapest outlay. If fibre is used in a mixture it will soon break, and horse-hair will not last so long in hard wear. The butt or root end of the bristle supplies what is needed for the reliable hard brush, and the bright, needle-like stiffness of these knots should be looked for. They can also be obtained with a row of knots set in the end of the stock to brush out the welts. For blacking with oil or water blacking, or applying polish, a softer quality is required.

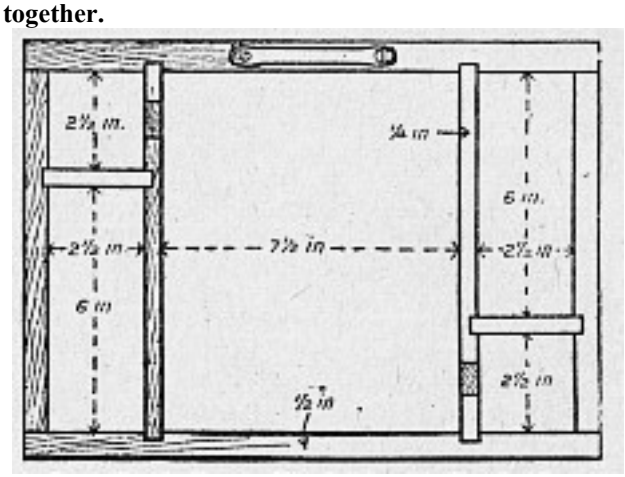
The polishing brush should be of medium stiffness where blacking is used, and a softer one will give the right finish after applying polish. *See* Blacking; Boot; Boot Rack; Brown Boots; Brush.

BOOT BRUSH BOX. For those who use both black and brown boots the box shown in Fig. 1 will prove serviceable. The sizes given are approximate for an average size brush and pad, and the usual small tins of polish.



Boot Brush Box. Box holding cleaning apparatus for both black and brown boots.

The partitions provide for brushes in the centre, and black or brown polish and pad on either side. The sides can be housed and nailed and the holes stopped; or, in a rougher fashion, the parts can be nailed together.



Boot Brush Box. Details showing how the box, with its partitions, is made.

The partitions can be of ¼ in. thickness, being plain-grooved into position, as indicated at Fig. 2. These parts should be secured in position with just a touch of glue. The grooves are squared and the sides cut with the tenon saw, the core being removed with a ¼ in. chisel.

The bottom is best cut ½ in. longer and wider than the sides of the box, so that the edges, when the bottom is screwed on, can project ¼ in. on all sides, to be neatly rounded off for finish. A brass handle is screwed on for lifting purposes. This side of the box can be ¾ in. or ⅞ in. in thickness, using a 4 in. handle and 1¼ in. screws, entered well home. U-shaped openings in the sides of partitions fronting the small wells will facilitate the removal of the paste boxes.

BOOTEES: How to Knit. In choosing wool for a baby's bootees be sure it is of good quality, well shrunk, and soft in texture. They will often be in the wash, so cheap wool is a mistake, and they must not be made too small, or they will stop circulation instead of assisting it. In using wool or ribbon ties, be sure they are not pulled too tight.

The following pattern is simple in plain knitting, and two needles only are used till just at the finish. The materials required are 1 oz. of well-shrunk 4-ply fingering in white, pink, or blue, three knitting-needles, No. 10, and 1 yd. of narrow ribbon. The ribbing may be continued nearer the ankle by working an additional 8 rows with 30 rows plain knitting.

Cast on 40 stitches. Rib knit 2, purl 2 for 16 rows; then work 38 rows in plain knitting. For the next row — the 55th—knit 2, wool forward, knit 2 together to make a row of holes, and repeat this till the end of the row. Knit 2 rows in plain knitting. Then begin the instep of the foot as follows: Knit 14, then knit backwards and forwards on the next 12 stitches for 34 rows. Break off the wool (fastening the end firmly) and leave these stitches on a needle or safety-pin.



Bootee knitted according to the directions given in this article.

Begin again with the 14 stitches on the left of the ankle, picking up the 17 stitches along the side of the instep piece just finished, and 6 of the stitches left on the safety-pin. Take another needle and knit on the other 6 stitches across the toe, the 17 stitches on the other side of the instep, and the 14, stitches at the ankle. Knit backwards and forwards, using the three needles for 14 rows, without shaping. Then work 6 rows, decreasing once at the beginning and end of each needle. Cast off.

Sew up the seam neatly, threading the ribbon through the holes at the ankle. *See* Baby.

BOOT LACE. East India kip provides the leather for laces used with heavy boots. Mohair laces are usually a mixture of wool and cotton. The leather buckle lace worn with golf and other sporting shoes consists of a thin strap of leather inserted through the eyelets of the shoe, and fastened by means of a nickel, or other metal buckle instead of being tied.

BOOT POLISH. Wax polishes are coloured with aniline dyes, black or brown as required. The surface obtained on the boot must not be sticky, hence a very hard wax, known as carnauba wax, is employed.

The wax is boiled with borax or soda to form an emulsion, and this is mixed with a hot solution of soap coloured with nigrosin (an aniline black). Boot dressings in liquid form, used for ladies' kid shoes, contain shellac, which has been dissolved in borax or soda solution. If soap is added a dull finish is given in place of the gloss of the plain shellac dressing. *See* Blacking; Boot.

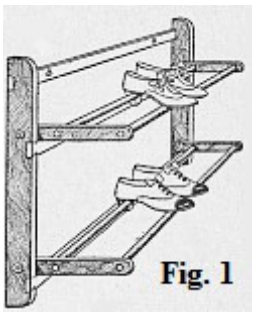
BOOT RACK. A folding rack is shown in Fig. 1. It is made with a back and two folding frames, and in the size shown is capable of holding eight pairs of ladies' or six pairs of gentlemen's boots. If a larger rack is desired the length of the rail may be extended or height of rack increased. To make it, 4 ft. 6 in. of 3 in. by ¾ in., 10 ft. 6 in. of 1½ in by ¾ in., and 8 ft. 1 in. of ¾ in. round material must be arranged for. The 3 in. material is cut into two 2 ft. 3 in. lengths, the 1½ in. into three 2 ft. 2 in., and four 1 ft., and the ¾ in. into four 2 ft. ¼ in. lengths.

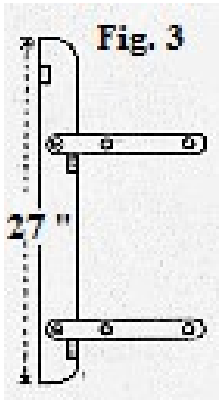
For the back take the two 2 ft. 3 in. lengths of 3 in. material for the sides, and the three 2 ft. 2 in. lengths of 1½ in. for the rails. Dovetail the two front rails into the front edges of the sides, and the back rail into the

back edges, in the positions at Fig. 2. The ends of the sides are shaped as at Fig. 3, and hanging holes are bored.

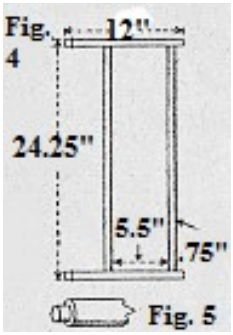
The two folding frames are exactly similar. For each take two of the 1 ft. by1½ in. pieces for the sides, and two of the round pieces for the rails. The frames are made to the dimensions shown at Fig. 4 by shouldering down the ends of the rails to ½ in. diameter, for a length of ¾ in., and boring holes in the sides into which the shouldered portions of the rails may fit.

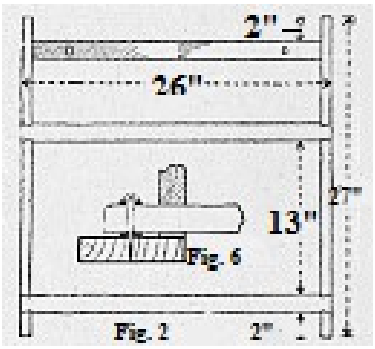
The frames are fitted to the back with rivets or round head screws, as at Figs. 3 and 6. The frames when extended rest on the edges of the front rails of the back, as at Fig. 3. A coat of stain or varnish will be necessary as a finish.





Boot Rack. Fig. 1.Useful rack made to fold against the wall when not in use. Figs. 2-6. Diagrams showing details of construction.
(By arrangement with Evans Bros., London)

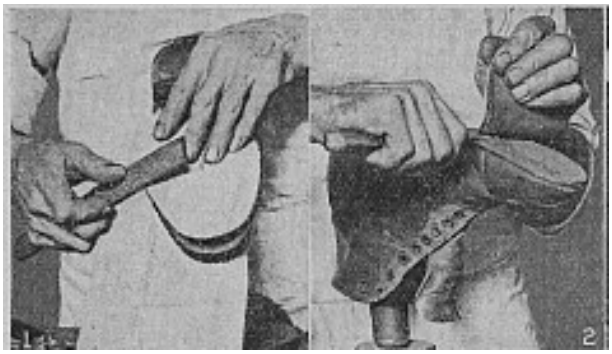


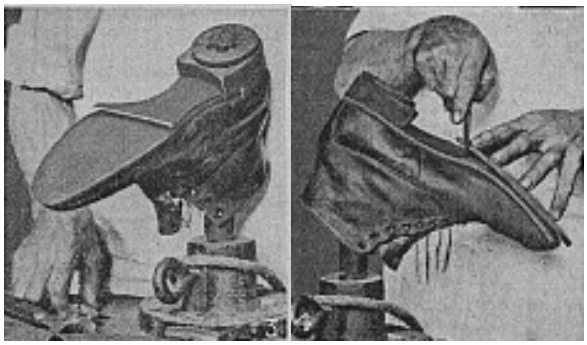


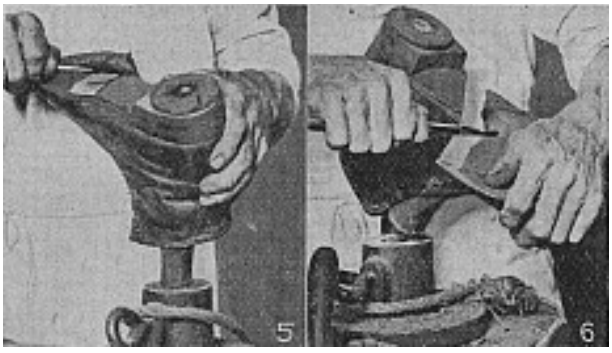
BOOT REPAIRING IN THE HOME
Essential Processes Simply Described

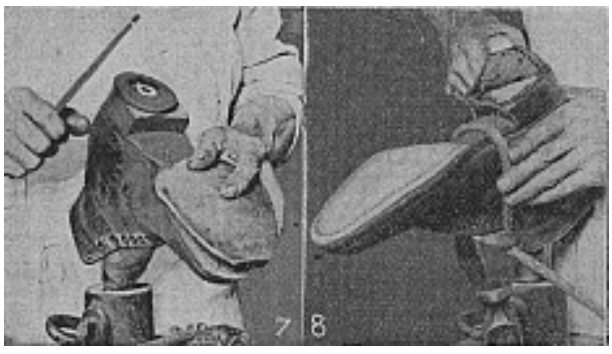
Readers may usefully turn to the preceding article on Boot, in which hints are given on the selection and care of footwear. See also Clog.

Most boots and shoes in ordinary wear today are either welted, where the outer sole is stitched through the edge to a welt sewn round the edge of the upper, or machine-sewn, where the outer sole is sewn through to the inside of the boot by stitches going right through the sole substance. The outer soles may also be attached by riveting, by thin wire screws or, less frequently nowadays, by wooden pegs. Of these, all may be repaired by riveting on a new sole, although in the case of welted boots it is preferable that it should be stitched on. With machine-sewn boots, a sewn sole makes a better repair, but it is quite adaptable for riveted repairs, as described in this article, the only method practicable for the average home worker.



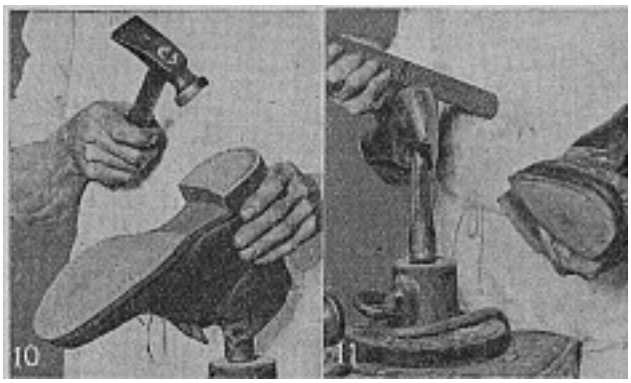






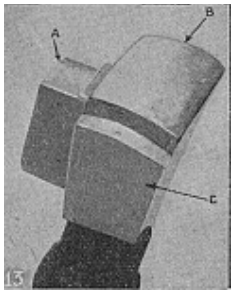


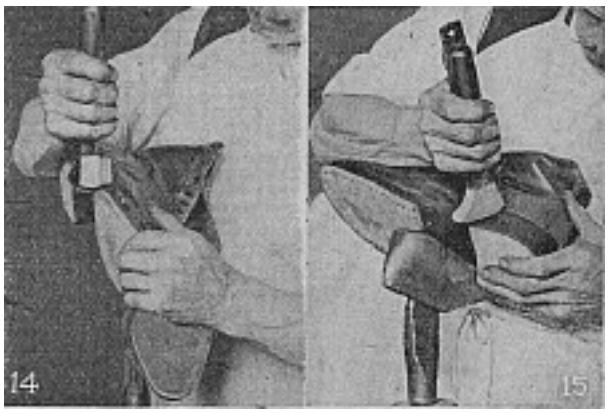
Boot Repairing. Figs. 1-9. Illustrations of the various stages of soleing and heeling a pair of boots, the correct method of doing which is described in the accompanying article.



Boot Repairing. Figs. 10-15. Concluding stages in soleing and heeling a pair of boots, showing how the heels and soles should be finished off with a rasp and sandpaper and finally burnished.







The essential tools are a shoemaker's hammer, with one head; a couple of shoemaker's knives, one ground right down to a small triangular blade, which will be found the most handy for cutting off the worn sole of a welted or sewn boot; a shoemaker's rasp, rounded on one side and with a flat file surface on the other; a straight awl, sandpaper (No. 1½), a glazing iron, the most convenient shape to use being the combination iron. Also shoemaker's ink, heelball, and the indispensable rivet. The rivets will be of the length most suited to the job in hand, and should be preferably brass, except in cases where a double row of rivets is fixed to take wear, when iron should be used.

An iron foot or last is necessary. This can either be attached to a shaft in an iron socket fixed to a bench, or, where repairing is only an occasional job, an iron foot fixed in a wooden stick or "leg" resting on the floor may be used. Several sizes of iron feet will be required for men's, women's, and children's boots, and these will be interchangeable in the same wooden leg.

Leather can be purchased ready shaped up in soles and top-pieces, or it can be bought by the piece. Select a piece with even, smooth grain and equal substance. The flesh side should not be loose, but should be firm and hard. If a pattern of the sole to be replaced is taken in paper (Fig. 1), this can easily be applied to the piece of leather chosen and waste avoided.

The pattern is made by placing a piece of newspaper flat on the sole of one of the boots with the edge across the waist where the graft is to be, and passing the file side of the rasp downwards round the edge of the sole, leaving the exact shape of the sole filed out. In cutting the soles from the piece of leather, take care to turn the pattern over when cutting the second sole. Temper the leather by steeping it in a pan of cold water for 5 or 10 min. Then take it out, bending and twisting it in the fingers until the superfluous surface moisture is absorbed and the leather is mellow.

When the leather is fairly dry but still moist and plastic, place it grain downwards on the lap-iron—an old flat-iron minus the handle— held on the knees, and strike it firmly and evenly with the flat head of the hammer, commencing in the middle and working out to the edges. The strokes should not be too vigorous or the fibres will be crushed. This hammering makes the leather tougher and closes up the pores, making it more waterproof and more durable in wear.

Now take the boot to be repaired, and, after damping the bottom and placing on the foot, take off the old sole. The little pointed knife is inserted in the joint at about the spot where the new sole will join the old, and the stitches cut through to the corresponding point on the other side. In Fig. 2 a machine-sewn boot is shown, and the same method will apply to ripping a welted boot. If the old boot has a nailed sole, the toe should be prized up by inserting a screwdriver or blunt old chisel and the toe end of the sole seized in the nippers and levered back, the middle sole being held down firmly with the other hand meanwhile. The old sole should be cut off across the joint with a slanting cut, leaving a longer length of waistline on the old sole on the inside than on the out (Fig. 3).

Repairing the Middle Sole

Before proceeding further the middle sole should be made good. If the boot is worn so badly that part of the middle sole has been worn through, a thin patch should be placed over the worn spot with a couple of short rivets tapped in to keep it in place. Boots should never be allowed to wear through the middle sole before being repaired. It may be found that in ripping a riveted sole the middle sole has been pulled away from the inner sole. This should be knocked down and half a dozen rivets put in. These should be just long enough to penetrate the inner sole and burr over on the iron foot, but not long enough to turn over appreciably. They should be hammered well home.

Having made all secure, take the new sole and, placing it in position on the stripped bottom, with the back of the knife mark a line across the old waist where the groove or skived hollow for the end of the

new sole is to start. (Fig. 4). Skive out on the old waist from this line, tapering towards the joint cut (Fig. 5). Now skive off on the flesh side of the waist end of the new sole, tapering towards the joint, but not too finely or sufficient substance will not be left to hold the waist rivets securely (Fig. 6). Place the new sole in position and, holding firmly, make a row of holes from side to side near the joint, but not too near. The first rivet is knocked in on the side (Fig. 7) , and the row of rivets is now finished across the waist.

After nailing the waist, press the fingers across sole, hammer from waist to toe, and, holding down firmly, drive in a rivet in the centre of the fore part quite near the toe. The new sole should now be lying snug on the middle sole, and the edges of the sole should be pared close, care being taken not to cut the edge of the middle sole.

A line is now drawn about ⅜ in. from the outer edge all round the sole. This can be done with the thumbnail, using the first finger as a guide on the edge of the sole. Now with the awl make the holes for the rivets at equal distances all round, not too far apart, taking care to hold the awl perfectly upright.

When some degree of expertness is attained in driving the rivets, the hole-pricking may be dispensed with, the rivet being pressed into the leather (which should be still sufficiently moist and plastic to enable this to be done) with the left hand, as if placing in the hole made by the awl, and then one smart tap should drive it home. After the whole row has been completed, the edge of the sole should be well hammered all round in order to drive the rivets home.

Before finishing the edge, the heel may be taken in hand. The corner of the top piece should be prized up and seized with the nippers, and the top piece pulled off, the boot being held firmly on the foot with the left hand. The second lift should never be allowed to get worn through, as a worn-over heel destroys the shape and appearance of the boot, in addition to putting an undue strain upon the boot upper at the heel. But if the second lift is worn, then a cut should be made across the heel, so that the worn part can be prized off and a new half-lift nailed on (Figs. 8 and 9).

Trim off and, after taking out any protruding nails or hammering down, rivet on the top piece. To secure this, ¾ in. rivets should be used, and then a double row of shorter rivets to take the tread (Fig. 10).

Sole and heel are now ready to be finished off. The first process, supposing the edges to have been closely trimmed up with the knife, is rasping. This is effected with the round side of the rasp, and gives the edge a slightly hollowed shape (Fig. 11), which is accentuated with the round edge of the buffing knife (Fig. 12).

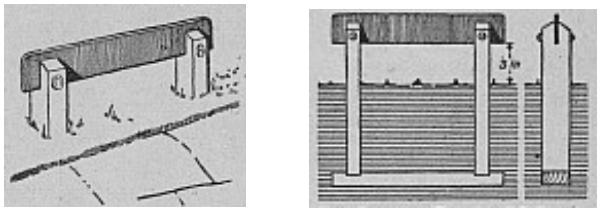
The heads of the rivets on the sole should be rubbed over with the flat side of the rasp. If it is desired to finish the joint in a workman-like manner, the upstanding edge of the new sole can be skived off with the knife, the surface at the joint rasped, and then the whole surface of the sole can be buffed and finished off with sandpaper.

The edges of the sole are now finished off with sandpaper and inked. When this is dry we proceed to the operation of setting the edge or polishing. For this the combination iron will be found most convenient. Fig. 13 shows this tool with its different faces, A, B, C. First the inked edge, having been allowed to dry, is ironed, and then a thin coating of heelball is applied, and the iron, warmed up but not made too hot, distributes the heelball evenly over the surface. Firm, even pressure with a quick motion will produce a smooth, shiny surface, and then, to finish off, the superfluous heelball is taken off, and a final polish applied with a piece of cloth, which is folded across the thumb. Figs. 14 and 15 illustrate the method of holding the iron, and show the different edges that are employed for sole and heel.

BOOT SCRAPER. A boot scraper saves dirt and mud being brought into the house, and one similar to that shown in Fig. 1 can easily be made. The scraper is constructed with a wooden framework consisting of two sides and a bottom bar, and is fitted with a scraping-iron at the top.

The side bars of the framework are 10¾ in. long by 2 in. wide by 1 in. thick, and slots 3/16 in. wide are cut 1½ in. in from the top ends. The bottom bar is 12 in. long by 2 in. wide by 1 in. thick. Notches 1 in. wide by ¼ in. deep are cut in the upper face of the bottom bar to receive the bottom ends of the side bars.

The scraping iron should be 12 in. long by 2 in. wide by 3/16 in. thick; the top corners are rounded, and 3/16 in. holes are bored at the ends. The iron fits into the slots at the top ends of the side bars, and is fixed with 3/16 in. rivets, which pass through the bars and iron.



Boot Scraper. Figs. 1 and 2. Simple scraper and method of fixing it.

Before fixing, at least three coats of good oil paint should be applied. A hole must be prepared in the ground to receive the framework, the scraper being fixed at the height suggested in Fig. 2. The earth around the framework should be well stamped down.

BOOT TREE. There are various patterns of boot trees, and to use them to the best advantage they should conform as nearly as possible to the shape of the boot worn. It would not do, for instance, to put a round-toed tree into a pointed-toed boot, as it would be almost certain to stretch the toe out of shape. A boot that is treed-up immediately after wearing and left until again required will retain its original shape. *See* Boot.

BORACIC ACID. One of the most useful of the mild antiseptics is boracic or boric acid. For soothing irritated or painful eyes, one part of boracic acid to forty parts of water is a widely used lotion. Mixed with equal parts of powdered zinc oxide, it is a good dusting powder. For excessive perspiration of the feet, a powder containing one part of boric acid, two of starch, and two of zinc oxide, dusted into the socks, gives excellent results. In saturated solution boracic acid forms a non-irritating, antiseptic lotion excellent for cleansing sores.

BORAGE. The flowers and also the aromatic leaves of borage are used for flavouring such beverages as claret-cup or negus; the leaves and young tops may be employed in salads. The flowers are blue, the leaves oblong and clothed with white hairs, the stems about 2 ft. high, hollow and rough. The plant is best grown as annual, seed being sown out of doors in spring. A foot apart is a suitable distance for the plants, which like a rather dry and stony soil. *See* Claret Cup; Negus. Pron. Bŭrridge.



Borage. Flowers and leaves of the aromatic garden herb.

BORAX. The white powder known as borax occurs naturally in California, and has the chemical name of biborate of soda. It is much used as a mild antiseptic and as a water softener. Dissolved in glycerin (1 oz. of purified borax in 6 oz. of glycerin), it is known as glycerin of borax, and is used for thrush and in other forms of sore mouth. Good results have followed the administration of borax in epilepsy.

As a gargle for sore throat the proportion to use is 1 oz. of borax dissolved in a pint of water. As an eyewash 8 grains of borax in 1 oz. of water is the proper strength to employ. Borax ointment, made by mixing 1 oz. of borax with 8 oz. of spermaceti ointment, is an excellent application for chilblains or cracked nipples. For softening water a teaspoonful of borax is added to a ewerful of water, the advantage of borax over soda being that borax does not affect even the most sensitive skin. Borax is no longer used as a food preservative.

BORDEAUX. The wines of Bordeaux contain the least amount of sugar, alcohol, and acid of any, and are not fortified with any spirit. They are generally divided into four classes, which differ in taste, colour, bouquet, durability, and price. In the first class are what are known as the Chateau wines, such as Chateau Lafite, Chateau Latour, Chateau Margaux, and Chateau Haut Brion.

The second class comprises wines such as Rauzan, Beaune, Mouton, Leoville, La Rose, Pichon, and Longueville. In the third class are wines such as Château d'Issan Poujets, Cantenac and Giscours. In the fourth class are the clarets, St. Julien, Pauillac, and St. Estephe. *See* Claret; Grape; Sauterne, etc.

BORDEAUX MIXTURE. The most effective spray for apples and pears is Bordeaux mixture, and it can be relied on to prevent scab. The Ministry of Agriculture Leaflet No. 245 describes its preparation and use in orchards. The best formula is: copper sulphate, 4 lb.; best quicklime (in lump form), 4 lb.; and water, 50 gal. The copper sulphate should be dissolved in a small wooden vessel at the rate of 1 gal. of water per lb. of sulphate. On no account should iron or tin vessels be employed.

The lime should be slaked to a fine paste with a little water in another vessel, and water added gradually to make a milk, and finally diluted in a large barrel to the requisite amount (46 gal.). The 4 gal. of copper sulphate may now be poured slowly into the diluted milk of lime, and the mixture stirred thoroughly during the process. The two solutions may be kept separately for a long time, but after mixing the solution should be used at all events within 24 hours. *See* Apple; Pear.

BORDERS: THEIR EFFECTIVE GARDEN USE
Choice and Arrangement of Flowers and Plants

In this work the reader will find entries on the various plants and flowers mentioned in the following article. See also Bedding; Gardening

A garden border is, strictly, an expanse of soil devoted to the culture of flowers, fruit or vegetables, which has the shelter or protection of a wall or fence along one side. Modern usage, however, gives the name to any extended flower bed, e.g. one by the side of a lawn or in front of a shrubbery.

Borders are described as herbaceous, mixed, spring or autumn flowering, according to the nature of their contents. The best are those which rely chiefly upon perennial subjects for their seasonal beauty. Beautiful herbaceous borders are practicable in almost every garden, provided the site is open and unshaded, and the soil good and of sufficient depth to permit of a bed of friable mould 18 in. to 2 ft. deep. A short, wide border is better than a long and narrow one, as the narrower the border, the more difficult it is to arrange the plants in bold groups. In very narrow borders plants have to be restricted to the small kinds.

In a 6 ft. border most of the large kinds would have to be left out or used in units, but with a support at the back for climbers or creepers, satisfactory groups of the smaller plants could be formed.

The great majority of hardy herbaceous plants flourish in ordinary well-cultivated soil. Heavy soil needs rough digging and full exposure to weather some weeks before the time comes for planting, which is best done in early autumn or February-March. Let no effort be spared to get a deep bed of friable soil.

Deep and thorough hoeing is essential during the growing season. If the border is being made beside a path, the front area should be levelled and rolled to a width of not less than 2 ft. and turf laid, a strip of well-kept sward forming an admirable foil for flowers.

In dealing with a single-faced border, one backing a wall, hedge, etc., the planter will work from back to front; but in dealing with a double-fronted border, he will work from centre to front on two aspects.

If there is no wall, fence, hedge, etc., shrubs or small trees should be included to provide a permanent background. This should not be attempted in a border less than 12 ft. wide, but, instead, some of the taller, coarser herbaceous perennials—golden rods, sunflowers, and mulleins, for example, might be used.

The following is a short selection of the principal border plants:

TALL PLANTS FOR BACK AREAS

Campanula (*pyramidalis*)
Delphinium
Helenium
Foxglove
Golden rod
Hollyhock
Mullein
Coneflower
Sunflower

MEDIUM PLANTS FOR MIDDLE AREAS

Coreopsis
Erigeron
Day lily
Gypsophila (*paniculata*)
Helenium (*Crimson Beauty*)
Lily
Lupin
Michaelmas daisy (small kinds)
Monkshood
Phlox
Red-hot poker
Sea holly
Spiraea

DWARF PLANTS FOR FRONT AREAS

Campanula
Carnation
Columbine
Geum
Inula
Iris
Montbretia
Pentstemon
Peruvian lily
Pink
Potentilla
Poppy
St. Bruno's lily
Sea lavender
Snapdragon
Veronica
Viola

It has to be remembered that not only must there be liberal spacing between the various groups, but also between the components of each group.

Rose pillars may be introduced with good effect. As a rule the best line for them is just behind the centre, and they need not be nearer than 12 ft. apart.

In the double-fronted border, the centre will be occupied by hollyhocks, eremuruses, larger Michaelmas daisies, willow herbs, mulleins, delphiniums, golden rods, and other tall or bulky plants, not forgetting the rose pillars. In the half-centre spaces will go phloxes, monkshoods, heleniums, coneflowers, spiraeas, peonies, etc.; while in the front will come day lilies, erigerons, sweet Williams, antirrhinums, columbines, Canterbury bells, coreopsis, geums, pentstemons, cinquefoils, achilleas, leopard's banes, evening primroses, heucheras, pyrethrums, and globe flowers.

The following is a selection of plants suitable for borders only 4 or 5 ft. wide. They may be set singly if the border is a short as well as a narrow one, or grouped in threes if it is of fair length:

Achillea
Antirrhinum (intermediate)
Aubrietia
Borage
Campanula (*persicifolia*)
Carnation
Christmas rose
Cinquefoil
Columbine
Coreopsis
Oranes-bill
Day lily
Evening primrose
Foam flower
Gaillardia
Geum (Mrs. Bradshaw)
Goat's beard
Golden drop
Heuchera (*sanguinea*)
Incarvillea
Inula (*glandulosa*)
Iris
Jacob's ladder
Japanese anemone
Jerusalem Cross
Leopard's bane (*Doronicum*)
Lungwort
Meadow rue
Montbretia
Pentstemon
Peony
Peruvian lily
Phlox
Plantain lily
Pyrethrum
St. Bruno's lily
Scabious (*Scabiosa Caucasica*)
Sea lavender
Sedum (*spectabile*)
Stokesia
Toadflax
Veronica (*longifolia*)
Wallflower



Border. Herbaceous border is a large garden at Hindhead, Surrey. The clipped holly bushes make an effective background for the sequence of flowers, those shown being the blossoming of June.

It should be an aim with the flower gardener so to dispose his plants that each area of the border has bloom throughout the season; and to aid him to accomplish this, the most important plants are given in three groups:

EARLY FLOWERING HARDY PLANTS

Columbine
Geum
Iris (some)
Leopard's bane
Peony
Pink
Pyrethrum
Thrift

MID-SEASON HARDY PLANTS

Achillea
Anchusa
Campanula (most)
Campion
Canterbury bell
Cape hyacinth
Carnation
Cornflower
Day lily
Delphinium
Evening primrose
Foxglove
Goat's rue
Hollyhock
Iris
Lily
Loosestrife
Lupin
Monkshood
Montbretia
Moon and ox eye daisy
Mullein
Phlox
Poppy
St. Bruno's lily
Spiraea
Veronica

LATE BLOOMING HARDY PLANTS

Coneflower
Golden rod
Japanese anemone
Michaelmas daisy
Pentstemon
Red-hot poker
Sedum *(spectabile)*
Sneezeweed
Sunflower

To let plants alone year after year is to invite gradual degeneration, and it is an accepted idea that the most vigorous perennials should be divided every two or three years. Some take a full year to re-establish themselves after being transplanted. Among them are peonies, perennial poppies, Christmas roses, lupins and others with long, tap-like roots. When such plants are overcrowded it is quite possible carefully to lift portions of growth without disturbing the main roots.

Most hardy plants like sunshine, but a few will succeed in the shade, and some of these are given in the table below:

American cowslip
Anemone
Asphodel (*Asphodelus ramosus)*
Auricula (Alpine)
Barrenwort
Bergamot
Bleeding heart
Campanula
Campion
Christmas rose
Columbine
Cyclamen
Dog's tooth violet
False hellebore
Foam flower
Foxglove
Fumitory
Globe flower
Grape hyacinth
Honesty
Lady's smock
Leopard's bane
Lily
Lily of the valley
Meadow rue
Meadow saffron
Monkey flower
Narcissus
Periwinkle
Polyanthus
Primrose
St. John's wort
Saxifrage
Sedum (*spectabile*)
Snake's head
Snowdrop
Snowflake
Solomon's seal
Spiraea
Winter aconite
Wood hyacinth
Wood lily
Woodruff



Border Terrier. Prize-winning specimen of this popular breed of dog.

BORDER TERRIER. This is a very interesting breed of terrier which has achieved a not inconsiderable degree of popularity during recent years. According to the Earl of Lonsdale these terriers have been kept in the Kennels at Lowther Castle for over a century. The Border Terrier should weigh 13 to 15½ pounds and its colour is either red wheaten, blue and tan or grizzle but the first named colour is certainly the most popular and it is one that is generally accepted. The coat should be harsh in texture and close-fitting. A compact body and straight limbs, with catlike feet are essentials, whilst the head should be broad in skull, strong in muzzle and jaws level, with V-shaped ears. The tail should be carried gaily but never docked. *See* Dog.

Borecole. This is the name of the vegetable more usually called curly kale (q.v.).

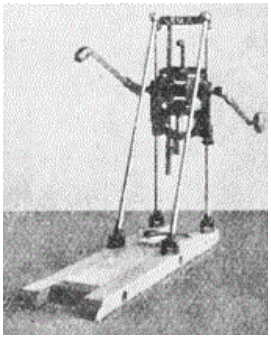
BORING: And Boring Tools. Boring is any process for making a hole in wood, metal, or other material, and, strictly speaking, it is a machine process. Apart from the recognized drilling operations, the tools mostly used for boring include single hand tools, such as the bradawl and gimlet, double-hand tools such as the brace and bit, and the regulation wood-boring machine. This last consists of a wooden or metal base, with an angularly adjustable upright member carrying a spindle, rotatable by means of bevel gears and two crank handles. The tool is usually an auger bit and fed into the work by means of a rack and pinion, actuated automatically or by hand.

Bradawls are used to make holes for nails and screws. The brace and bit are employed to make holes from a small size up to 1½ in. or 2 in. diameter in wood.

Holes are bored in brickwork or stone by means of a steel chisel or bar shaped with four flutes, thus forming an X-shaped cutter. Sometimes a jumper or tubular cutter is used. Either is pressed against the brickwork, given a blow with a hammer, rotated a quarter turn, and given another blow, and so on until the tool is driven in to the required depth. China and glass are bored with a special drill stock.

When the lathe is used, if the object to be bored can be mounted on a faceplate or held in a chuck, it is customary to bore the hole with a hand tool, or preferably a tool held in the tool post of the slide rest. If the nature of the job prohibits this treatment, it is customary to bolt the work to the saddle of the lathe, adjusting it by means of packing blocks until it is axial with the lathe centre. A rough hole having

been previously cast or drilled through the work, a boring bar is inserted through the hole and mounted between centres in the lathe.



Boring. Vertical boring machine for large timber.

A cutter is adjusted to the correct diameter and secured with a wedge or otherwise to a transverse slot in the boring bar. The latter is set in motion, and the work fed up to the tool, which thus bores the hole. A rough cut is usually taken first, followed by a smooth or finishing cut. Other methods of boring include the use of the oxy-acetylene blow pipe. *See* Bit; Blow Pipe; Brace; Bradawl; Drill; Gimlet.

BORZOI. This dog is a Russian wolfhound of great size, graceful form and majestic appearance. He is a first-rate house dog, perfectly companionable, and of affectionate disposition. The colour is white, variously marked with yellow, fawn, brindle, blue, or black, or the coat may be without markings.

The long, slender head is triangular in shape, with dark eyes, and small thin ears set far back. The long coat may be either flat, curly, or wavy, but it must not be at all woolly; on the neck it should form a profuse curly frill. The long tail, carried low, should be well feathered. *See* Dog.



Borzoi. Champion of the Russian breed of large white wolfhound. It is one of the tallest dogs.

BOSTON: A Good Card Game. For this there are four players, the cards rank as at whist, are cut for deal and choice of seats. The cards are shuffled only once throughout the game, and the player to the right of the dealer cuts, leaving at least five cards in each packet. The player opposite the dealer cuts the pack, and the top card is turned up for trumps. This suit is called first preference, and the suit of the same colour second preference. The remaining two suits are plain suits.

The object of the game is to win a nominated number of tricks. Beginning with the eldest hand, each player in turn bids that he will win a certain number of tricks, naming his own trumps, or to lose a certain number of tricks without trumps. The player whose bid is accepted plays against the other three.

The bids rank as follows: Boston, to win 5 tricks; to win 6 tricks; to win 7 tricks; little misery, to lose 12 tricks after discarding a card which is not shown; to win 8 tricks; to win 9 tricks; grand misery, to lose every trick; to win 10 tricks; to win 11 tricks; little misery with the cards exposed, also called little spread; to win 12 tricks; grand misery or big spread with all the cards exposed; grand slam, to win every trick.

Players are provided with white and red counters, the latter being worth five white. One red is placed by each player in a pool, and when there are more than 25 reds in a pool, the surplus is set aside, only 25 being allowed to be seen on each deal. No bid of less than 7 tricks wins a pool unless the adversaries insist on playing the hand out. If a player wins the nominated tricks he is paid by the others and takes the pool for 7 tricks or over. If the loss be double the pool he pays his opponents. One red counter must be placed in the pool for a misdeal and four for a revoke. Players are only paid the number of tricks they have originally bid, though they may win more.

A bid must be made with named trumps. The next player may say "I keep," meaning that he bids the same number of tricks in one of the preference suits. A player calling higher says "I keep over you." If all pass, the deal is void, each player sorts his cards in sequence and they are packed and cut for a fresh deal. Whichever player wins the bid, eldest hand always leads. When little miseries are played, each player discards a card which he does not show. Spreads must be laid down before any card is led.

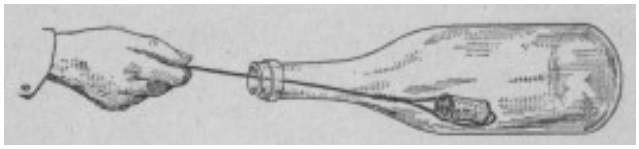
The actual paying for winning a bid varies, but is generally as follows: 10 for 5 tricks; 15 for 6; 20 for 7; 25 for 8; 35 for 9; 45 for 10; 65 for 11; 105 for 12; 170 for 13; 20 from each player for little misery; 40 for big misery; 80 for little spread; 160 for big spread, with corresponding penalties for losing.

BOTTLE. The average household does not make as much use of carefully washed old bottles as it might do. The ordinary graduated medicine bottle, for example, makes an excellent liquid measurer. Most of them are divided off into teaspoonfuls or tablespoonfuls. Besides the advantage of quickness in measuring a number of tablespoonfuls of liquid the bottle is more accurate, as tablespoons vary in size considerably.

Bottles are in constant request in photographic work. Different shapes or different sized bottles should be used for developing, fixing, and other solutions, so that they can be handled and used in the dark room, where the light is not always sufficiently clear to read the labels.

A simple way to remove a cork that has fallen into a bottle is to make a loop of string, or preferably wire, and insert it into the neck of the bottle. Turn upside down and shake until the cork comes into such a position that the loop of string or wire catches it, when it can be forcibly withdrawn. For a cork that has broken off in the neck of a bottle insert the blades of two penknives on opposite sides of the cork, and pull the handles slightly towards one another and slowly twist and pull. This will generally remove the cork.

The stoppers of glass bottles are sometimes difficult to remove. One method is as follows: Place a little olive oil between the stopper and the mouth of the bottle, stand the latter in a pan of cold water, and heat the water slowly. Take the bottle out and allow to cool. In the cooling process some of the oil will be drawn in between the stopper and the bottle neck and loosen it. Often a tight stopper may be removed by wrapping the neck of the bottle in cloths dipped in hot water. This allows the neck to expand sufficiently to force the stopper out. It is advisable in the case of bottles which are constantly in use to tie the cork or stopper to the neck of the bottle.



Bottle. Simple method of extracting a cork which has fallen into a bottle.

Warm water and soap first, then a thorough rinsing with cold water, will clean most bottles; and if they are wanted to dry quickly a little methylated spirit should be sluiced round inside the bottles and the latter stood upside down to drain. Small bottles may be cleaned with a solution of egg-shells in lime juice. Discolorations can be removed by putting into the bottle a raw potato (cut into pieces) with a teaspoonful of salt and twice that amount of water. Shake well and when the bottle is clean rinse with cold water. Alternatively, rinse with strong caustic soda. Salt and vinegar is an old-fashioned way of cleaning bottles which is effective. A bottle which has contained petrol should be washed out with thin, warm milk of lime.

Bottles sent by post should be wrapped in corrugated cardboard, as a protection against breakage. It is advisable to label all bottle-containing liquids, for it is not always possible to tell what a bottle contains by the appearance or smell of the contents. *See* Baby; Cork; Feeding Bottle; Hot Water Bottle.

BOTTLE WAX. Ordinary sealing-wax has a basis of shellac, which readily melts at a flame, and quickly sets when the heat is withdrawn. For bottle wax resin is used instead of shellac, the properties of which it resembles. A preparation made with resin answers well as a sealing for bottles and parcels, and is cheaper. Bottle wax is used for wine bottles and to keep airtight jars or bottles of pickles and syrups. The following table, gives representative recipes:

RED.	Resin	2 lb.
	Tallow	½ lb.
	Vermilion or red lead	3 oz.
	Resin oil	1½ oz.
BLUE.	Hesin	4 lb.
	Cottonseed oil	5 oz.
	Zinc white	1 oz.
	Ultramarine	4 oz.
GREEN	Resin	2 lb.
	Tallow	3 oz.
	Brunswick green	1 oz.
	Prepared chalk	½ oz.
	Resin oil	½ oz.
YELLOW.	Resin	5 lb.
	Tallow	½ lb.
	Chrome yellow	5 oz.
	Prepared chalk	1 oz.
	Resin oil	2½ oz.

The general process of preparation is to melt the resin and tallow in an iron pan over a gas flame, taking care that the mixture does not catch fire. When this is done rub down separately the colouring matter and other powders ordered with the resin oil or cottonseed oil. This should then be stirred into the melted resin. When the mixing is completed the wax should be poured on to a warm plate which has been slightly greased, and rolled into thick sticks by means of a warm roller.

THE BOTTLING OF FRUIT

How to Secure Successful Results

The articles on the various fruits suitable for bottling, e.g. Apricot; Loganberry; Plum, etc., may be consulted for further information

Fruit may be preserved for an almost indefinite time if it is properly bottled. This object is attained by placing the fruit to be preserved in a suitable jar and then raising the temperature sufficiently to destroy or render inactive any germs present on the fruit. The jar is then sealed, so as to prevent germs from entering from the outside. This is termed pasteurisation.

Screw-top glass jars are the best, though those supplied with a metal spring are quite satisfactory. Before use the bottles should bo carefully tested for possible flaws, as the seating for the rubber bands is apt to be imperfect. When small quantities of fruit are to be bottled, a large saucepan or fish kettle for heating water will suffice for a steriliser, provided it is deep enough. For fairly large quantities, a pan holding one or two dozen bottles is necessary. Care in the choice and renewal of rubber rings is essential.

Fruit for bottling should be of good quality and not over-ripe, or fermentation may take place. It should be graded, wiped and prepared, e.g. currants stalked, plums stoned, pears cored and halved, etc.

Pack it tightly in the bottles without bruising it, and fill them with cold water to overflowing. Place on the rubber ring, cap and screw-band or clip; screw up and then release slightly to allow air to escape during pasteurisation. Clips or springs allow the air to escape automatically. Place the bottles in the pan in which they are to be pasteurised; the cold water in the pan must just be within an inch of the tops of the bottles. Different fruits require different treatments, but for most the following method will be found satisfactory:

With Thermometer.— Bring to the required heat

slowly at the rate of approximately 2° Fahrenheit per minute. A temperature of 155° to 180° is necessary.

Without Thermometer.—Bring the water very slowly to simmering or until the hand cannot be held on the pan lid. When this point is reached lift up a bottle for examination. If the fruit is still firm in the bottle, put it back in the pan; but so soon as it begins to move about when the bottle is twisted it is ready to come out.



Bottling. Showing how a perfectly sealed jar can be lifted by the cap.

Should the water in the pan become too low through boiling, more should be added, but it must be of the same temperature as that in the pan. When ready the bottles should be removed, the covers at once securely fastened down, and the bottles allowed to cool slowly. Hot bottles must be placed on a cloth wrung out in hot water to prevent cracking. When quite cold, remove the screw or clip and test the efficiency of the seal by lifting the bottle by the cover.

The Dry Method of Bottling

The dry method of bottling, which is more particularly suited for plums and gooseberries, is very simple. Pack the fruit tightly in the bottles, and place in a slow oven on a piece of wood, cardboard or asbestos, or the bottles crack at once, until the fruit shrinks slightly; it is then ready to come out. Have boiling water ready, remove one bottle, fill up with the boiling water, and fasten securely before taking another bottle from the oven. See that the lids and fittings are warm before being placed on the bottles.

Though glass jars with a special device for sealing are to be preferred, if they cannot be obtained, ordinary wide-necked bottles or jars may be used, and sealed. The necks of the bottles should not be larger than is necessary for the insertion of the fruit. Sealed bottles should be examined from time to time, in case fermentation or mould growth occurs in any of them. If this happens the contents should be consumed without delay. Ordinary bottles or jars should not be packed so full of fruit as special bottles, on account of the sealing necessary to render them airtight; otherwise pasteurisation should follow the lines of bottling in special bottles.

Two layers of parchment paper may be pasted separately one over the other and tied with fine string, provided that the bottles are afterwards kept in a cool, dry place. Corks may be used instead, scalding them well first, and then sealing the tops with bottle-wax.

The use of syrup is not essential, pure water being equally suitable and rather more transparent. This bottling being done without sugar, when the fruit is needed for use pour juice into a pan and add sugar to make a syrup. Bring this to boil, then add fruit and cook over top of stove very slowly for a few minutes only. Fruit bottled under the National Mark, always reliable, can be bought without hesitation.

BOTULISM. The form of food poisoning known as botulism is due to the presence of a microbe in fruit or vegetables which have been canned or bottled; nearly all the outbreaks have occurred where the preserving was done at home. The symptoms are vomiting and diarrhoea, with abdominal pains, cramp, and paralysis or weakness of the legs, and perhaps difficulty in speaking. Death may result.

The danger of poisoning is removed by cooking the food before use; warming is not sufficient. *See* Food Poisoning.

BOTTOM HEAT. The term is applied in gardening to the process of raising the temperature of the soil in which plants are being grown in a heated greenhouse. It is usually obtained by running a row of hot water pipes underneath the borders, but occasionally, as with mushroom beds, the desired effect is obtained by the ferment of manure.

Bottom heat is chiefly used to hasten the growth of seedlings and cuttings for planting out purposes and for forcing early vegetables.

Bottom heat should be used very sparingly when forcing half-hardy subjects for bedding out, otherwise the young plants will grow up very tall and weedy. Soil temperature can always be taken by means of thermometers manufactured for the purpose. *See* Gardening; Greenhouse.

BOUGAINVILLEA. This is a greenhouse climbing plant, a native of S. America. As it loses its leaves in winter, it is valuable because it does not interfere with the admission of sunlight into the house for the benefit of other subjects. Its rose-coloured flowers are borne in bracts from spring till summer. Rich loam (old turf) soil suits it admirably. It thrives in a temperature which may vary from 55° to 70°, according to the season. The shoots should be hard pruned in spring.



Bougainvillea. The delicately tinted flowers which make this plant a popular greenhouse climber.

BOUILLON. To make this clear broth, wash and dry 2 lb. lean beef and cut it into small pieces. Chop any bones, and soak bones and meat in 2 quarts cold water for half an hour, add a teaspoonful salt and bring the broth slowly to boiling point.

Then skim it and add to it a carrot, an onion, and a turnip, prepared and cut in quarters, a small bunch of herbs, paisley and a bay leaf, 2 cloves, 4 allspice, 6 peppercorns, and 2 chopped sticks of celery. Simmer

(do not actually boil, or it will be cloudy) for 3 hours, removing any scum. Strain through a fine clean cloth into a basin and leave until cold. Remove all grease, re-heat and carefully season before serving in small soup cups, a tiny dust of chopped parsley being added to each cup. Sufficient for about 12 persons.

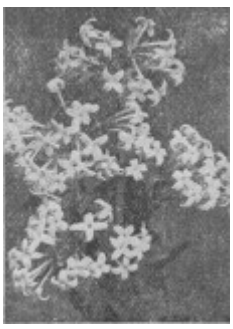
BOUQUET: Of Flowers. The florist's elaborate bouquet is usually presented on ceremonious occasions, at public functions, and also at weddings, though at the latter the sheaf of long-stemmed flowers or the round, closely packed quaintness of the Victorian nosegay is often seen.

For the sheaf, long-stalked lilies of any kind, gladioli, tulips, carnations, or a mixture such as delphiniums and pale pink roses be used. The flowers are arranged in the same way as in a florist's bunch of fine daffodils, but a layer of moss or fern is placed between graduated row of stalks, and tied in with them, to form a packing which prevents the flowers from shifting, and the whole is completed by ribbons.

The Victorian bouquet is a round massing together of small blossoms, and the more compact and conventional it is the better. A delightful example is composed of pink moss roses in the centre with circles of forget-me-nots, white pinks, mauve and purple violas, magenta stocks and mignonette, widening out to the desired size. The whole should be encased in the lace paper holder the period and tied up with narrow ribbons to match the flowers.

The etiquette of bouquets is simple. For the débutante, on presentation, or other lady attending a court, the bouquet is not included in dress regulations, but may be carried if wished, and is usually a costly affair, chosen at a court florist's to match the dress. The wedding bouquets for bride and bridesmaids are the gift the bridegroom. At the beginning of the service the bride hands her bouquet to the chief bridesmaid to hold. It is permissible for a widow-bride to carry a bouquet of coloured flowers. *See* Bride; Flowers.

BOUQUET GARNI. This is more delicate in flavour than the packet of mixed dried herbs, and is used for sauces and stews. It is made of a few sprigs of parsley, a bay leaf and a sprig of thyme tied up together.

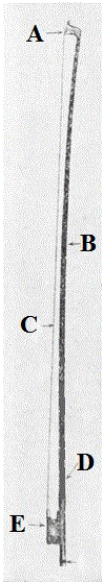


Flowers of Bouvardia, a favourite greenhouse shrub.

BOUVARDIA. There are pink, scarlet, double and double white varieties of Bouvardia, which is a greenhouse shrub bearing flowers in autumn and winter. It is a dwarf and bushy, and grows well in a compost of three parts loam, one part peat-mould, and some sand. Pots of 5 in. or 6 in. diameter will suit it. The plant should be stood in a shady place in the garden, or in a frame during the summer, and brought into a warm house in September.

After flowering, the young growths should be cut back to the old wood. New shoots ripen during the summer, and produce flowers the following winter. Propagation is effected by young shoots inserted in pots in spring.

BOW. The bow is the means whereby the strings of a member of the violin family are made to vibrate. It consists of a slender stick of snake-wood or Brazilian lance-wood, cut straight, following the grain, subjected to heat and then slightly bent. Strands of white horse- hair are carried from the top of the bow to the nut, the latter being fitted with a screw; it is tightened for playing, and relaxed after use in order to preserve the resilience of the wood.



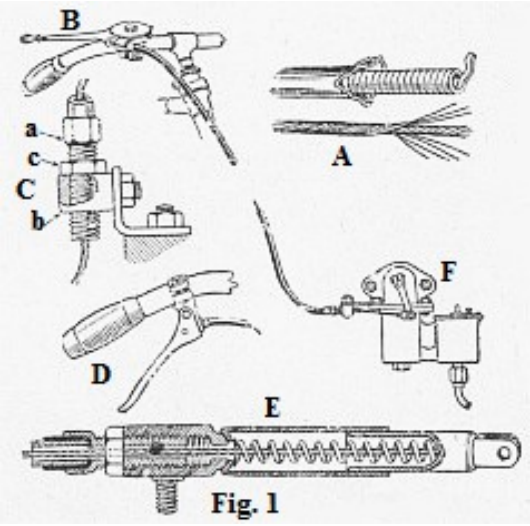
Violin Bow. A. Point. B. Stick. C. Hair. D. Wrapping. E. Heel or nut. F. Screw.

It is a characteristic of horse-hair to possess certain tooth-like roughnesses, which, aided by resin rubbed on to it, catch the string of the instrument, and cause it to vibrate and thus sound. In course of time the hair wears away to smoothness, and the bow must then be re-haired. Holding the bow in his right hand, with the thumb upon the nut, the player draws it across the string at a right angle, but with the stick slightly inclined towards the left hand and about midway between the bridge and the finger-board. The wrist must be kept loose and supple, and the movement of the forearms should be free, but without any unnecessary motion of the elbow. By variation of pressure, and by differences of movement in the bow, the player, is able to secure all gradations of tone, as well as any desired species of phrasing.

BOWDEN CONTROL. The Bowden wire control for cycles and other machines of the same kind consists primarily of two members. The cable, or inner member, is composed of fine wire strands twisted together. The outer member, or sleeve, is formed of square-section non-rusting wire wound close up like a tension spring, and covered on the outside with a flexible waterproof material, as shown at A (Fig. 1). The working principle of this form of control is as follows: The inner member is fastened at one end to the part to be controlled, and its other end anchored to the control lever (B and F, Fig. 1), which shows the mechanism controlling a carburetter. There are numerous forms of control levers, all of which work on the same principle. Particulars of the brake control mechanism are given in the article on brakes (q.v.).

An advantage of the Bowden control lies in its adaptability for all classes of control where awkward turns have to be overcome. To ensure easy working never assemble the control without first coating the wire with a mixture of thin oil and fine graphite. The

best method to secure the wire to the control is, where possible, by the use of the nipple supplied by the makers. If this is not practicable, double the wire over and bind with thin copper wire, not forgetting first to solder the wire where you have to cut it, should it be too long. The control lever must be right home against the outer casing. It should not be forgotten that the lever to be operated is at rest, i.e. that the length of naked wire showing at the end attached to the lever to be operated must be equal to the distance travelled by the lever during its full movement (F, Fig. 1).



Bowden Control. Fig. 1. Separate parts of the mechanism controlling a carburetter (see text).

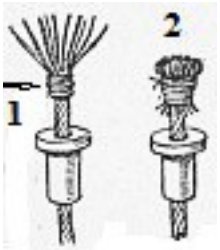


Fig. 2



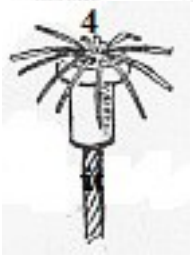


Fig. 3



Fig. 2. Diagrams illustrating methods of making temporary repairs. 1. Bind with cotton. 2. Then fold ends down and bind very tightly. 3. Wire folded and bound with a pin inserted through the loop. If these temporary repairs are called for where a drum shaped nipple is employed the nipple must be omitted the knob taking its place.

Fig. 3. Permanent repair: correct method of securing a Bowden wire into the nipple. 4. Solder here and finish off as shown at A with a file.

So that the position of the lever may be set to a given position when at rest, a form of adjustable stop is provided as shown in C (Fig. 1). By such a stop the position of the outer member may be brought closer or withdrawn further from the operated lever, the result of so doing being either to lengthen or shorten the radius of movement. This adjustable stop consists of a sleeve (a), cupped at the end to receive the outer casing and screwed the whole of its length, so that it may be positioned where required in the stop (*b*), and locked by means of the nut *(c).*

A tension spring is attached to the lever to be operated, so that it is pulled back to its original position when the control lever is released, or returned to rest, as the case may be, according to whether it is of the friction design, B (Fig. 1), that stops where placed, as used for throttle controls, etc., or of the free design, D (Fig. 1), as used for cycle brakes and exhaust controls. In one type of Bowden control the spring is placed over the cable at the controlled lever end, and the whole enclosed in two tubes, the outer one being stationary with the outer member, and the inner one travelling with the wire (E, Fig. 1). Fig. 2 shows various methods that may be employed as temporary only, by which it is possible to get home if a breakage should occur on the road. Fig. 3 shows the correct method of securing the Bowden wire into the nipple. *See* Bicycle.

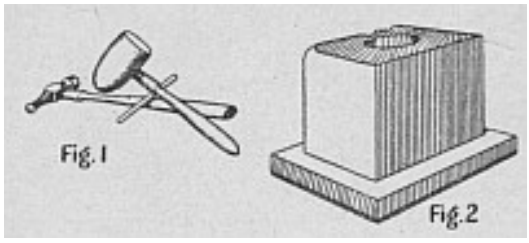
BOWL: How to Make. In silver, copper, bronze, brass or Benares metal, bowls hold plants or flowers. In papier mache or pottery they are useful for bulbs, cut flowers or fruit, and are charming for this purpose in coloured stone-ware. Glass and lustre bowls also have a decorative value.

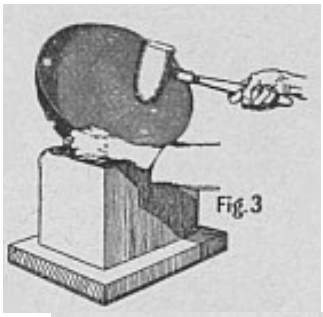
The making and ornamenting of a bowl of simple form in one of the ductile metals, such as copper, brass, or silver, can be accomplished at home with the aid of an anvil-block and a few tools. These comprise a ball pene hammer, a round-faced hardwood mallet (Fig. 1), a few ornamental punches, a pair of tinman's snips, pliers, and file.

The anvil-block can be made from an odd length of hardwood about 6 in. by 4 in. wide by 6 in. deep. Set it with the end grain upwards, and fasten it to a baseboard with a piece of felt on the underside, as in Fig. 2, if the work has to be done on a table. It is preferable to hold the anvil-block in a vice. The best material to begin on is sheet copper about No. 20 gauge.

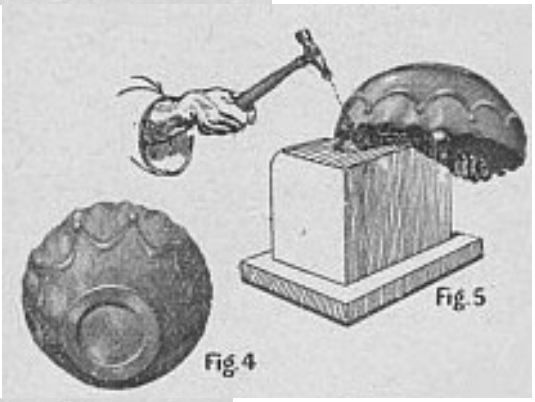
Cut a disk of copper of about 6 in. diameter and file the edges clean and smooth. Then draw circles from the centre of the disk, spacing the lines ½ in. apart. Holding the disk in the left hand, press it flat on to the anvil-block, so that the centre of the disk may be over the hollow in the block, and strike a blow near the centre with the round-faced mallet. This will cause an indentation or stretching of the copper, and it is by a series of light, rapid blows, producing numerous indentations, that the bowl is ultimately shaped. If the hammering, commenced in the centre, is carried steadily round and round the bowl, using the lines as a guide, until the rim is reached, then working back to the centre, the metal will speedily assume a bowl-like form, as indicated in Fig. 3. The next step is to beat out

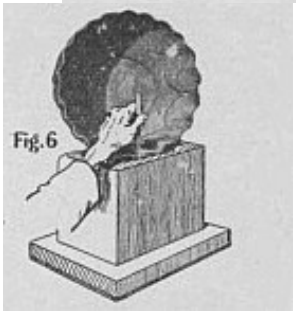
as many of the hammer-marks as possible, obliterating them by light blows, and using a curved faced block or the curved corner of the block shown in Fig. 2.



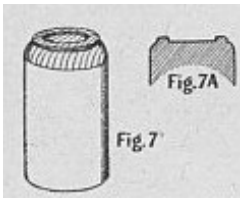


Bowl. Implements used in beating out an ornamental metal bowl. See text.











Repeated hammering hardens the copper, and when this is observed the metal must be annealed, which renders it quite soft. The edges of the disk may exhibit a tendency to cockle or pucker, but this will be of no great consequence when the design exhibits a scalloped edge, as shown in Fig. 4. This is formed by hammering the edge in a hollow-shaped part of the anvil, as in Fig. 5, working scallops on opposite sides of the bowl instead of progressing round the rim. The ornamentation, consisting of a conventional floral garland, is formed with the aid of a steel punch with a leaf-shaped end, held between the thumb and forefinger of the left hand, while the bowl is supported between the third and fourth fingers, as in Fig. 6.

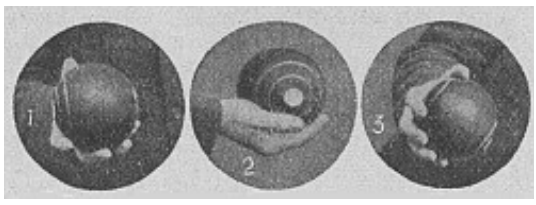
A circular block shaped as in Fig. 7, seen in section in 7A, will facilitate the flattening of the base. The use of the block is shown in Fig. 8, where the hammer is seen beating the base to a flat surface and forming the stiffening rim in the bottom. A final touch up with the hammer, giving a light blow or two here and there, will produce the finished bowl (Fig. 9), which then only requires scouring with silver sand and water and a good rubbing with metal polish. *See* Dent Iron Work; Bulb; China; Finger Bowl; Salad Bowl.

BOW LEGS. Rickets in children are usually the cause of bandy or bow legs. The legs should be loosely bandaged from the ankle to the crutch with a wide, soft flannel bandage. Then splints 4 in. wide, carefully padded with cotton-wool, should be bandaged along the outside of the thigh and leg. The splints should extend well up above the hip joint, and some 3 or 4 in. beyond the sole of the foot, and should be worn during the day for a month or so.

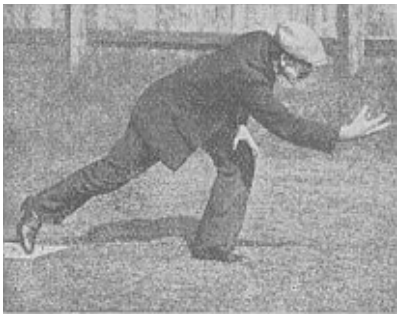
BOWLS: How to Play. The full-sized bowling green is 42 yd. square with six rinks and a ditch about 6 in. wide all round, but the game may be played on a smaller space and is in vogue on many private lawns as well as on club greens throughout Great Britain. In the north some of the greens are crowned to slope from the centre to the ditch, but in the south they are generally level.

All that is required for the game is a jack and a few sets of bowls, together with an india-rubber mat about 22 in. by 14 in. The jack is an earthenware ball which should not exceed 2 ½ in. in diameter nor more than 10 oz. in weight; it serves as the tee and must be at least 25 yd. away from the mat on which the player stands. The bowls are of lignum vitae or other hardwood, or in some cases of composition; they must not exceed 16½ in. in circumference and 3½ lb. in weight, and are made with a bias, one side being weighted in such a way that the course of the bowl tends to run in a curve. The extent of the bias varies, but, strictly speaking, the bowl should draw at least 6ft. in a distance of 30 yards.

Any number of players up to four may oppose each other in a separate game, and on a full-sized green almost any number in reason can get a game. If there are only two players, or two on each side, each player uses four bowls; in a three-a-side game each player has three bowls, and in a rink, or four-a-side, each has two bowls. In all cases the points (or ends) are 21 up.



Bowls. Above. 1. Correct way of holding the bowl or wood. 2 and 3. Two wrong ways of holding.

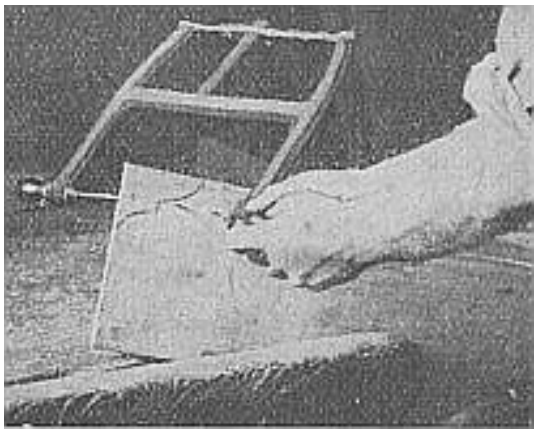


Correct attitude immediately after delivery of the ball, one foot being still on the mat. (Courtesy of Jarrold & Sons, Ltd.,)

In an ordinary game one of the leaders places the mat within a yard or two of the boundary. He then places on the mat one foot, which he ought not to lift. He rolls the jack in any direction which seems convenient. There are rules about the order in which each player bowls, but the last to bowl are the two skips, as the captains are called. If the players are expert nearly all the bowls will be lying close to the jack some time before the turn of the skips comes. Till then they remain behind the jack and direct the aims of the other bowlers.

When all the shots have been delivered the players examine the positions of the bowls nearest to the jack, and 8 times out of 10 there is no difficulty in finding the bowl which is nearest, and wins the end for its side. If there is any doubt, accurate measurements are made. When the point has been settled the leader of the side which has won the end takes the mat and rolls the jack to some other part of the green, and the game then proceeds as before.

BOW SAW. A bow or frame saw is used for cutting out various curved shapes in wood. It consists of a central bar with two end members, the horns of which are drawn inwards by a cord tensioned by twisting the lever or tourniquet.



Bow Saw. How the saw should be held with both hands to ensure a steady cut.

The opposite ends have handles movable in the holes drilled to receive them. The saw blade is long and narrow, pierced at each end to receive a pin. Slots are cut in the metal ends of the handles and the saw is retained in position by slipping it into the slots and inserting the pins. The blade should be tensioned by twisting the cord. The saw is generally used with a vertical up-and-down movement, the teeth cutting on the down stroke.

Good quality bow saw frames are made in beech or similar hardwood. The length of the blade depends on the size of frame, 12 in. being suitable for amateur use. The width of the blade should be governed by the work to be done. For delicate work use the narrowest blade, and with fine teeth; for large work use a wider blade with coarse teeth. Three different widths of blade will be ample as a selection for amateur work. The work should be held in the vice and both hands used on the bow saw, the sawing being done in a horizontal position when possible. *See* Saw.

BOW WARE. A soft paste porcelain made at Bow and Chelsea in the 18th century. Old Bow is generally chalky white and coarse and heavy for its size, although some is of eggshell thinness. It has a glassy lead-glaze, which with age has become iridescent and discoloured, often with brown patches and stains.



Bow Ware. Chimney piece ornament characteristic of this porcelain. (Courtesy of Law, Foulsham & Cole, Ltd.,)

The figures, usually designed for chimney-pieces, were more highly coloured than Chelsea, and often have square holes at the back for the metal stems of candle-nozzles. Bow never imitated Sèvres vases or Dresden groups, but was successful with partridge, hawthorn, and dragon services in the Chinese taste, as well as with blue-painted ware, white with modelled reliefs, openwork baskets, sprigged tea-sets and landscape mugs. It was mostly unmarked.

The common use of the anchor-and-crescent device in some styles often causes true Bow to be labelled Chelsea or Worcester. The marks are easily forged, and inexperienced collectors should beware of the Bow imitations with copied marks cleverly turned out in Paris and elsewhere. *See* China.

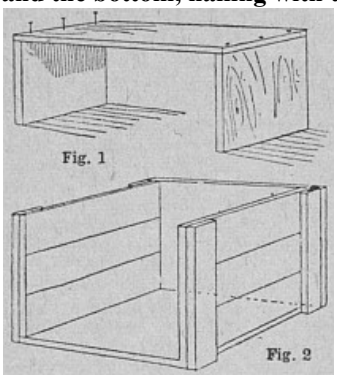
Bow Window. So called on account of its shape, this type of window is commonly termed a bay window. *See* Bay Window.

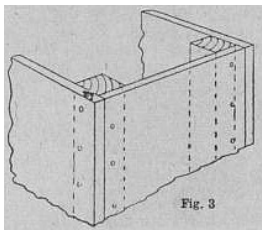
BOX: The Tree. The common species is a compact evergreen shrub with a characteristic pungent smell, thriving in most soils. It is a pronounced surface rooter, and is perfectly hardy. It grows up to 10 or 12 ft. in height, but is of very slow growth.

Box is easily increased by cuttings in frames in late summer. The lower branches may be layered into the soil in autumn, when suckers may also be drawn off and planted. The plant used for edging is a form of common box which is propagated by means of small rooted pieces in May. Box is one of the chief

subjects used in the practice of topiary work, which is the art of clipping trees and shrubs into fantastic forms of birds, beasts, ships, etc. The timber of the full-grown tree is used for small turnery articles such as peg tops *See* Wood.

BOX: How to Make. In making the simple box shown in Fig. 1 the two end pieces should first be cut. These should preferably be thicker than the sides, and in any case stout enough to give a good hold to the nails. Then cut the two side pieces and, standing the ends upright with one side piece spanning them, nail the side to the ends, as in Fig. 1. Then add the remaining side and the bottom, nailing with thin wire or French nails.





Box. Figs. 1 and 2. Diagrams showing how to make a plain wooden box. Fig. 3. Old box strengthened with corner pieces inside.

If a stronger box is wanted, or the ends are in several pieces, fit upright battens as in Fig. 2. It is customary when making this class of box to clench the nails, that is, drive them through the thinner wood into the battens and then knock over the projecting ends. A good method is to hold a spare hammer against the head of the nail while using another to clench the point.

A quick and effective way to strengthen an old box is shown in Fig. 3, where corner pieces of square wood are nailed to the inside corners. Incidentally, this enables the lid to be screwed on if desired, as the corner pieces are stout enough to hold a screw. *See* Knife Box; Trunk; Window Box, etc.

BOX CALF. Box calf is largely used in the manufacture of handbags and of boot and shoe uppers, the better grades being made from first selection calf-skins. For the cheaper class of upper leathers, box-calf is imitated under the names of box kip, this being made from the East Indian small cow-hide and finished with a box pattern; or from split hides, in which case the leather is known as box sides. When chrome tanned calf is dyed brown instead of black it is called willow calf, and is frequently finished with the characteristic pattern of box calf.

All box calf is tanned by the chrome process, the skin being converted into leather by the action of chrome compounds, so that it is quite distinct from leather tanned with materials like oak bark. When first tanned the leather is of a blue colour; during later stages of manufacture it is dyed and finished, receiving the characteristic grain of box calf.

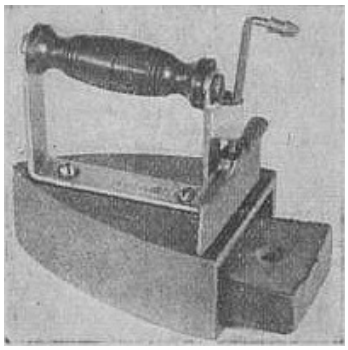
Genuine box calf is one of the best of all upper leathers. It wears well, gives to the foot, and if properly lasted the shape of the boot does not spread or become unsightly after continued wear. Even under the influence of excessive perspiration a box calf upper is durable. It should not crack after long wear, and if it does it is a sign of faulty tanning.

As with other types, the life of a box calf upper largely depends upon its preservation. Cleaning and polishing with a good reliable polish is all that is required; but the polish must be of sound quality. *See* Boot; Leather.

BOXING GLOVES. In buying these gloves it is necessary to see that they fit the hands comfortably, for if they are too loose or too tight a great deal of discomfort is certain to follow. Many boxers pay little attention to their gloves, but they ought to be kept absolutely clean, free from grit and grease. When they are new they want no attention except to work the fingers frequently about in them, in order to make them pliable.

If, as may easily happen even in the mildest form of boxing, a sprinkling of blood should get upon the gloves, they should be very carefully cleaned with a little linseed oil, for if the blood is allowed to cake it will make a hard spot which may damage an op-ponent's face. On no account should the gloves be damped with water. If they have to be put away for any length of time they should be thoroughly but sparingly oiled, for leather always has a tendency to perish and harden when it is not in use. The gloves should not be placed in a damp room, nor in one which is too hot.

BOX IRON. The old-fashioned kind was fitted with a plug, made red-hot in the kitchen fire and then plunged into the metal case. This was superseded by electric or gas irons, with which a continuous heat can be obtained. These are convenient, but unless a special plug or burner has been provided, they cannot be used when the fittings are needed for lighting purposes. *See* Flat Iron; Ironing.

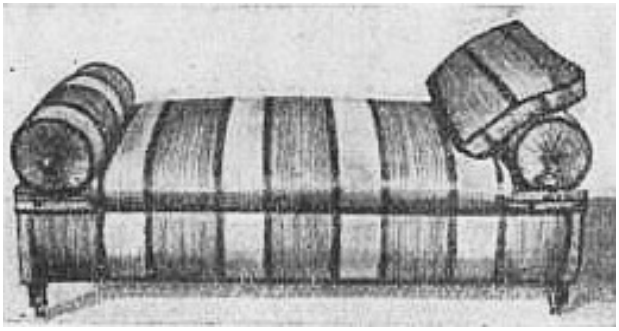


Box Iron. Showing block of metal which is heated in the fire.

BOX MATTRESS. A variety of the spring mattress, this is one in which the springs are enclosed in a horsehair or rugging stuffed mattress made on a strong wooden frame and fixed to the bedstead. It gives the bed a neat, upholstered effect, but an overlay has to be used as well. *See* Bedding; Divan; Mattress.

BOX OTTOMAN. **This piece of furniture is a combination of the loner seat or couch, known as an ottoman, and a box, the latter being formed by enclosing the lower part of the article. The seat is made in the form of a lid so that it can be raised when required.**

A box ottoman may be made from a large box with a hinged lid. The top is upholstered to make a comfortable seat, and the sides are covered in the same material.

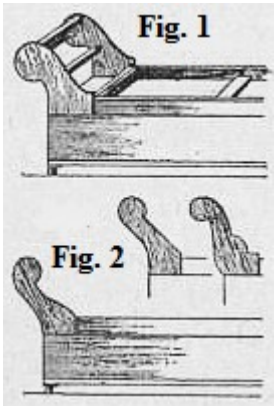


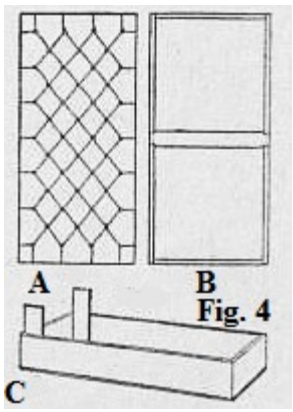
Box Ottoman. A combined piece of furniture (Courtesy of Williamson & Cole)

In addition to its value as a couch or bed, the box ottoman is serviceable for holding surplus things that crowd a room, bedclothes for an emergency bed, or even some of the household linen and underclothing. It is useful in the nursery for toys, appropriately loose-covered in coarse linen on to which toy designs are appliqued. Pine, if available, is suitable for use in constructing the box portion, the head scroll being of birch, beech, American whitewood or other hardwood.

If to be finished as a plain box without scroll head, the construction of the ottoman is of the simplest. A serviceable size will be 3 ft. 6 in. long by 1 ft. 6 in. wide, and 1 ft. 3 in. deep. Floor boards 1 in. thick and tongued are suitable, and are best dovetailed. A strong box, however, is made without the trouble of dovetailing by nailing or screwing a 3 in. by 1 in. clamp inside each of the longer sides, setting it back to the thickness of the short sides or ends, so that these can be nailed flush into the rebate thus formed, and a bottom nailed up to this. Castors should then be fitted, and this will complete the making of the base portion of the ottoman.

The lid may be of plain clamped boards of similar thickness and hinged to position, remembering to make the clamps sufficiently short to allow the lid to shut easily. The lid can be made as a tray, and is stayed from opening too far back by means of a couple of wide tapes nailed to the inside of the lid and the box side. The interior of the box can then be lined with sateen or any other material that is suitable for the purpose. In upholstering the sides and ends, these can be padded to curve nicely with cotton-wool and covered with cretonne or damask, carrying the material over the edges and into the inside of the box, where the edges are doubled and tacked down. The covering is edged along the line of the box bottom outside with variegated cord or gimp, tacked as before.





Box Ottoman. Figs. 1-4. Diagrams showing how to mark out and make a box ottoman with a scrolled head end.

The lid of the box can be easily covered with an evenly distributed layer of brown wool between two layers of wadding, the edges of the canvas being tacked to the box edge, and the final covering stretched tautly over this and tacked with gimp, cord or ball fringe edging.

In constructing the box for an ottoman such as that pictured in Figs. 1 to 4, a length of 5 ft. to 5 ft. 6 in. should be allowed, including space for a head scroll. The height of the seat framing may finish 1 ft. 4 in. to 1 ft. 5 in. In this way the rails of lid or seat framing are 3 in. wide, the box sides 12 in. wide, and bottom 1 in., an additional 1 in. or so being allowed for castors. Material 1 in. thick should be used for sides and lid throughout, this latter being preferably of birch, and the parts dovetailed together, and the bottom screwed well home with 2 in. screws. In making the lid a 3½ in. by 1 in. stretcher is cut into and screwed to the bottom part in the centre, as indicated at Fig. 1. Stout brass butt hinges should be used.

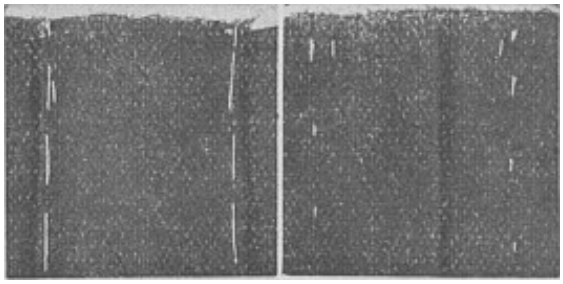
There are various shapes for the scroll portion of the ottoman, such as drum, scroll, bolster, roll, pillow, etc. For this portion of the work deal is often unsatisfactory, on account of its tendency to split when a considerable number of upholstering tacks are driven in, and it is better to use birch or beech 1 in. thick. A plain scroll may rise 6 in. to 7 in. only, or with any taller type of shaping, 12 in. will be a serviceable allowance. A choice of shapes is offered at Fig. 2, and these will suggest a variation in the finishing.

The elevation view at Fig 3 (B) is of average size, and is set out in 2 in. squares. When cut to shape the two scrolls will be fixed in position to the box framing with four hardwood dowels each, the four stuffing rails upon which the upholstery is built having previously been fitted between. The number of these stuffing rails, which can be 2 in. by 1 in., may vary according to the

upholstery design to be carried out. A stretcher rail of the same height as the lifting lid is fitted, as Fig. 3 (A). The scroll can be stiffened by means of two pieces of 3 in. by 1 in. wood screwed to the inside of head portion of box, as at Fig. 4 (C), these being sufficiently long to project and form stays for screwing to the inside of front and back scrolls. A plan of the underside of box lid is seen at Fig. 4 (B). This shows the stretcher rail dovetailed in.

For comfort it is preferable to finish with a spring seat. For this about 3 dozen strong 4 in. springs will be required, and these should be tied down to about two-thirds of their height when put in and covered with hessian. Every attention must be paid to the even spread of the stuffing, arching it well in the centre and diminishing it towards the edges, so that they are regular and devoid of lumpiness. Unless this is done very carefully and methodically, the ottoman will never make a comfortable seat. A covering of calico over the second stuffing, especially where hair is used, is recommended previous to receiving the final covering. An improved effect is obtainable by buttoning the seat; a plan of this is shown at Fig. 4 (A). The head stuffing would then be buttoned to agree. *See* Divan; Upholstery.

BOX PLEAT. The material is folded alternately towards the left and right to give large flat pleats, which must be all of the same size. If the pleating is to be all round, the material required is twice or three times the length needed for a plain skirt, according to depth of pleat desired. They retain their shape better when deeply folded.



Box Pleat. How the pleat in the material is tacked down ready for pressing; left, front; right, back.

Fix the folds with pins as they are made, measuring accurately to get each box-pleat exactly the same size. When all the folds are pinned in position tack them firmly with a needle and cotton, noticing that the three edges, pleat and material, are even. Finish the pleating at the top by sewing it into a double band of material or binding. Box pleats only set well when firmly pressed.

For double box-pleating two folds are placed to the left and two to the right to separate each box-pleat. *See* Pleating.

BOX THORN. Lycium chinense, or the box thorn or tea tree, is a vigorous leaf-losing shrub bearing small purple flowers which are followed by red fruits in autumn. It grows quickly and densely and makes a useful screen, especially in seaside gardens. It flourishes in ordinary soil in a sunny position and is increased by seeds sown in spring.

BRACE: For Drilling Holes. The carpenter's brace consists of a cranked metal bar, one end provided with means to hold the drilling implement or bit; the other end has a circular wooden knob or head. In the middle of the crank is a wooden handle free to rotate.

To use such a brace, a bit is inserted in the holder, which is known as a chuck. The left hand grasps the head, the right hand grasps the grip on the crank. The brace is held upright with the point of the bit exactly on the centre of the spot marked on the wood where the hole has to be drilled (Figs. 1-3).

The left hand is pressed firmly downwards, while the right hand is employed in rotating the brace and bit. The chuck is composed of a hexagonal exterior member that turns on a screw thread cut in the brace, this in turn contracting two or three jaws which grasp the bit or drill. Some chucks are only adapted for grasping brace shank bits, while others will do this and will also grasp ordinary circular shank drills. This kind is to be preferred for all-round use. Better quality braces are made with a ball-bearing head, which is a great advantage. The ratchet brace has a ratchet movement which can be thrown into or out of action by moving a sleeve on the crank. This device enables holes to be drilled in awkward corners or near to a wall, where it would be impossible to rotate a plain brace.

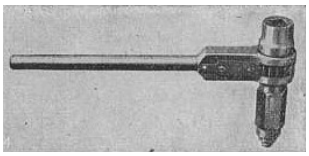


Fig. 4.

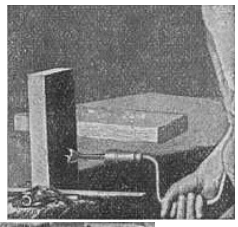
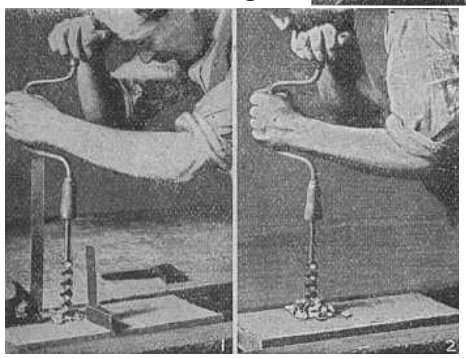


Fig. 3.



Brace: methods of holding for different classed work. 1. Vertically, with forehead resting on hand. 2. Vertically, with chin as support. 3. Horizontally with weight of body against brace. 4. (Top) Engineer's hand rachet brace.

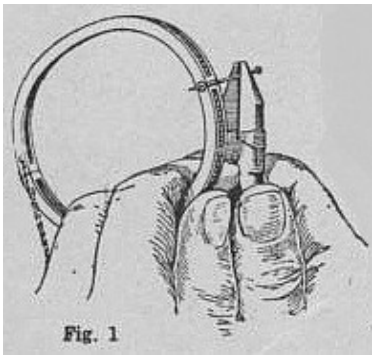
Amongst the uses of the brace, apart from drilling holes, is that of driving screws. This is accomplished very quickly by substituting a screwdriver bit. The enlarging of holes in metal or wood is done with a rimer bit. The cone-shaped recess to accommodate a screw-head is formed by the brace, using a countersink

bit. Rounding the ends of dowel pins is accomplished by using a dowel shaver bit and a dowel rounder bit. Shallow circular recesses or sinkings for a nameplate are formed with a brace and a Forstner auger bit.

The engineer's brace, Fig. 4, is a ratchet-driven tool for drilling holes. It is simple and effective, but is only employed where a hand drill would not be large or powerful enough, and when the work cannot be conveniently taken to a regular drilling machine.

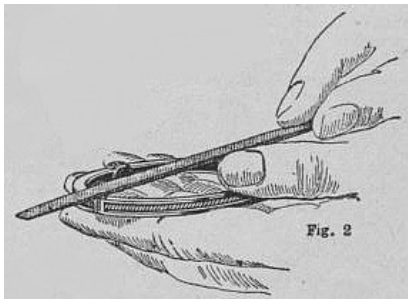
A rim brace is largely used for removing and replacing the nuts on most types of detachable wheels on motor cars. They are made in two forms, the plain brace, and an improved form with ratchet. Separate sockets are obtainable to fit these braces, and thus various size nuts can be dealt with from 5/16 in. to ⅞ in. across flats. *See* Bit; Boring; Drill.

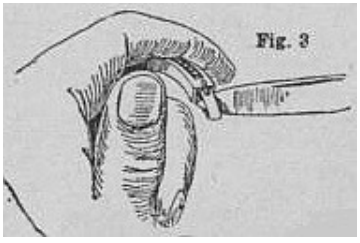
BRACELET. In the wide, old-fashioned varieties, which return to favour when bracelets are the vogue, one part likely to go wrong is the joint, through opening the bracelet too wide, straining the hinge and ultimately tearing it from its seating; this is prevented by attaching a safety chain just long enough to enable the bracelet to push over the hand.



Bracelet. Figs. 1-3. Diagrams showing small repairs in a gold bracelet.

Sometimes the small pin in the hinge will work loose and drop out. Another can be made by taking an ordinary stout brass pin and, with a pair of pliers, pushing it well into the joint until it is a tight fit, giving it a tap with the pliers to drive it home, Fig. 1. With a small file, nick the pin where it projects, break it off, and finish by filing it flat, Fig. 2. Should the clasp become weak, it can be improved by inserting the point of a pocketknife between the spring and raising, Fig. 3.





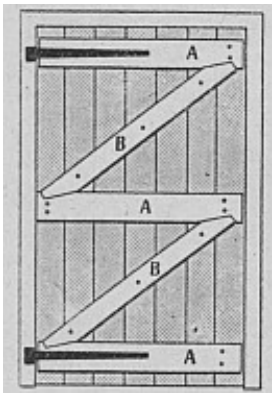
Where the front is set with jewels it should be examined periodically. Should one be loose. it is best to let the jeweller examine it, as a part of the setting may have worn away; but with a fairly new bracelet the edges of the setting may be rubbed down on the stone with the back edge of a pocketknife, or, if claw set, the points pressed on to the stone with the blade.

Pins in the joints of a flexible bracelet sometimes fall out. A new one can be made with a brass pin, as described in stiff bracelets. Expanders depend on the strength of small coiled springs inserted in each link for their expansion. They ought not to be opened and shut more often than is necessary, or the springs will weaken. If this happens, it is best to return it to the jeweller for respringing. An occasional wash in hot water, with soap and a few drops of olive oil, will keep the springs easy and smooth running.

The gold slave bangle is hollow and is usually sold in 9 ct. and 15 ct. gold. The calibre is a circle closely set all round with small stones, which are held in position by rubbing over the outside edges of the hoop. The greatest care has to be taken of these, because if they are twisted it is almost certain that a stone will fly out, or at least be loosened. If one stone should be lost, the bracelet should be taken to the jeweller and a new stone inserted, otherwise they will all work out.

Ivory and tortoiseshell bracelets are inlaid with gold wire or elephant hair. The gold inlay is springy, and a jar may dislodge it. Should this occur, brush a little Canada balsam or seccotine into the groove, press the wire down, and bind tightly with thin string and leave for 24 hours. As heat renders tortoiseshell soft and pliable, it should never be put into hot water. Should the surface become dull with wear, it can be improved by polishing with jeweller's rouge and a soft rag, afterwards washing out with lukewarm water and soap.

BRACING. This term is applied generally to all such work as the strutting of a rafter to prevent its sagging, the fitting of a diagonal brace to a timber framework, or an angular strut or brace to support the back of a chair. The principle is that of stiffening a structure by means of a supporting brace generally placed diagonally between the parts to be strengthened, thus transmitting the weight from the overhanging, or weak part, to the wall, foundation, or strong parts.



Bracing. Method of strengthening a door.

The principle is shown in the ledged and braced door illustrated. The ledges, A, cannot entirely prevent the planks which form the door from sagging, but the two braces, B, act as brackets or supports, and also help to prevent warping. Other examples will be found in the articles on Shed and Workshop.

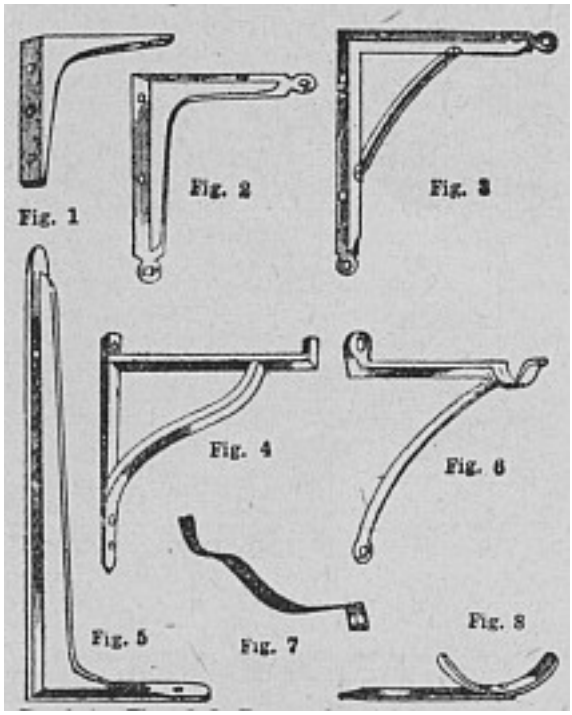
BRACKEN. Although quite wild, this common fern (Pteris aquilina) has certain domestic or semi-domestic uses. The fronds are largely used for bedding cattle. They are also used to a slight extent for

thatching houses and stacks. The stem of the bracken contains starch and has been used as a food.

Except in the wild garden bracken is of no horticultural interest, and, unless the wild garden is a large one, should not be introduced, as it spreads with great rapidity when once it has taken root, and it is somewhat difficult to get rid of it successfully.

BRACKET. As ordinarily understood, a bracket is an L-shaped metal support for a shelf, although there are other types, such as the bracket of a lamp, or a gas bracket, or electric fitting.

The iron bracket (Fig. 1) is intended for the repair of chairs or other furniture; these are usually 2 in. or 3 in. long and ½ in. wide. The strong light shelf bracket shown in Fig. *2* is known as the London pattern; it is made from pressed steel, and is finished in black japan. Usual stock sizes are 3 by 4 in. to 12 by 14 in. Another type similarly made, but with the additional stiffness given by the curved brace or strut, is shown in Fig. 3. They are handy for the rapid erection of shelves, a convenient method being to screw the brackets to upright battens of wood securely attached to the wall and reaching to the floor.

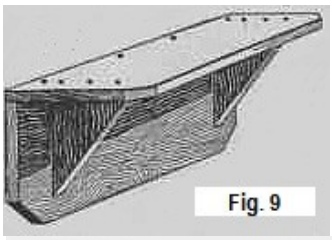


Bracket. Figs. 1-8. Forms of metal bracket in use for domestic or building purposes. See text.

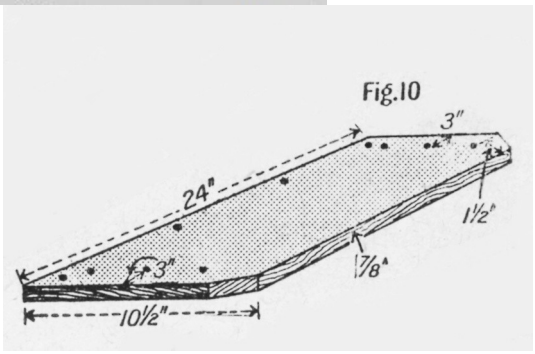
Shelf brackets intended to support plate glass or marble shelves are generally made in cast brass, either polished and lacquered or nickel plated (Fig. 4). The little upturned nib or lip at the outer end ensures the glass shelf from accidental movement. Such brackets are made in many sizes and shapes, also adapted for use on bars and posts for shop-window fittings.

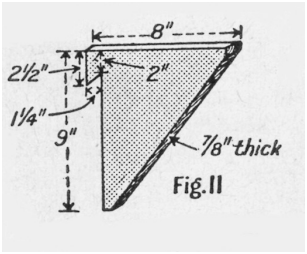
Partition brackets (Fig. 5) are stout iron castings supporting a wooden or other partition, and can often be turned to good purpose by the amateur. Stock sizes range from 12 in. wide by 24 in. high to 14 in. wide by 48 in. long.

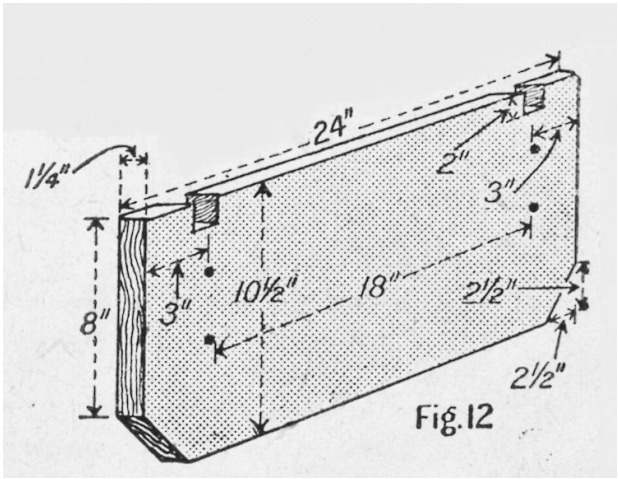
Bucket brackets (Fig. 6) are made in strong galvanised iron, and should be securely bolted to the wall to sustain the weight of a large fire bucket. Gutter brackets of two types are illustrated in Figs. 7 and 8, one to drive into a wall, and the other to screw on to woodwork. The householder should inspect the gutters and brackets occasionally, to be sure they have not sustained damage. If broken they should be replaced as soon as possible, as a damp wall is the result of neglected rain water gutters and their supporting brackets. There are numerous types of wooden bracket. Plain or ornamental wall brackets are everyday requirements in the home: they can be quickly made from odd material and coloured or decorated to suit any style of furnishing. This kind of bracket is effectively carried out in fretwork (q.v.).



Bracket. Figs. 9-12. Strong wooden bracket, for supporting heavy weights, with working drwings.







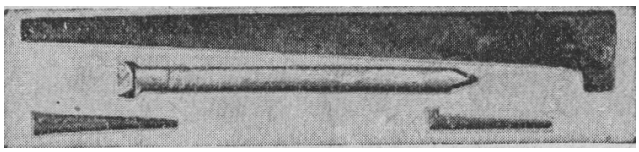
The strong bracket shown in Fig. 9 is useful for supporting heavy weights, and the sizes given may be modified to suit requirements. The parts as shown in

Figs 10-12 consist of a plain top, cut from commercial 11 in. by 1 in. deal, planed up on the face and edges, and finished off with bevelled corners. The back is of heavier stuff. 1¼ in. thick, and has notches cut out at 3 in. centres from each end. 2 in deep at the front and 2½ in. deep at the back, and ⅞ in. wide.

The brackets are shaped as shown and can be sawn out with a handsaw, planed up on the top and front edges and cleaned up to shape at the back with a chisel. The half dovetail projection must be cut to fit tightly into the notches cut in the backboard, its purpose being to prevent the bracket drawing forwards and to relieve the screws of some of the work. To assemble the bracket put the back in the vice, then glue the edge of the bracket and the notch in the back, and screw the bracket firmly in place with 2½ in. No. 10 countersunk screws inserted through clearing holes drilled in the back. Then glue and screw on the top, using four screws at the back and three into each bracket. Drill holes through the bark and screw the whole to wooden plugs cemented into a brick wall, or to the studding on a plaster wall, or employ Rawlplugs. *See* Bent Iron.

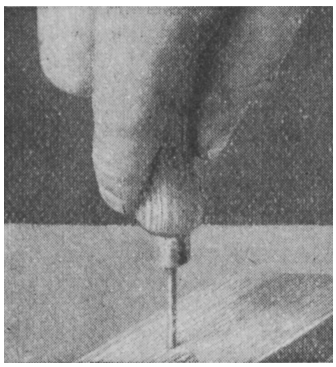
BRAD. Generally this name refers to an oval section wire nail with a narrow oval head. They are preferable to the ordinary wire nail for much internal household work. Convenient sizes are ¾ in., 1 in., 1½ in., and 2 in.

Types of nails known as brads are illustrated in their actual size, and their purpose is apparent from their names.



Brads of various sizes in common use. Top, floor brad; centre, carpenter's oval wire brad; bottom, left, shoemaker's brad; right, joiner's brad.

BRADAWL. A small hand tool not unlike a screwdriver in appearance, the bradawl is used for making holes in wood preparatory to inserting a nail or screw. The secret of success in performing this operation lies in cutting across the fibres. Commence by pressing the bradawl firmly into the wood, cutting across the grain and as deeply as possible; then twist the bradawl a little, thus enlarging the hole, and again force it down, cutting across the grain, and repeat the operation until the hole is deep enough. If the bradawl is pushed in with the blade set the way of the grain it will act as a wedge and split the wood. Bradawls are made in 12 sizes, from 3/32 in. wide to 7/32 in. wide. Three sizes will meet most requirements; and it will be found convenient to buy them ready handled.



Bradawl. How to hold this small boring tool.

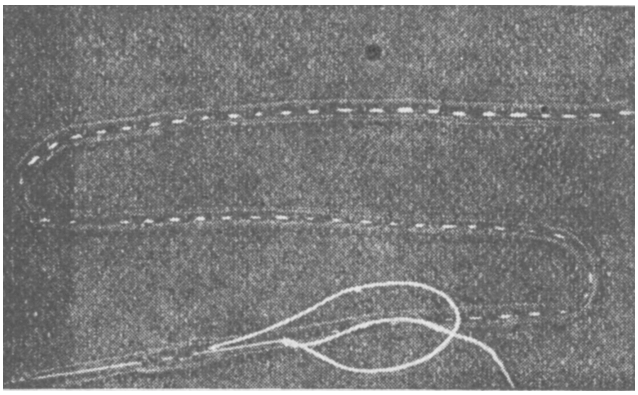
BRAD - PUNCH. A small steel punch, known as a brad-punch, is used for driving the head of a nail below the surface. These are made in four sizes, with cupped or hollow ends.

BRAG. In this card game, a variation of poker (q.v.), there are three special cards, the ace of diamonds, jack of clubs, and nine of diamonds, which may be called any card by the player holding them. Thus, a player may hold in his hand the ace of diamonds, king of clubs, queen of clubs, jack of clubs and ten of clubs. In that case he can call the ace of diamonds the ace of clubs to make a royal flush. The three cards are known as braggers. In brag, however, any natural hand beats any similar hand made with a bragger. Thus a pair of aces beats one ace and a bragger or three kings beat a king and two braggers. If two hands with braggers in each tie, the cards rank in the order ace of diamonds, jack of clubs, and nine of diamonds.

BRAHMA. Massive size and heaviness of leathering are the chief points in the appearance of the Brahma fowl, which formerly had a reputation for being a good layer and table bird, but is now kept almost exclusively for exhibition purposes. There are two varieties, light and dark. *See* Poultry.

BRAID. Composed of plaited threads, among the more familiar types are bootlaces, costume braids, Prussian bindings, cords and gimps used in upholstery, tinsel galons, and fancy artificial silk braids.

Costume braids, formerly made from worsted or mohair, are now composed of artificial silk. Russian braid, having a groove running down the centre, is easily stitched to other material.

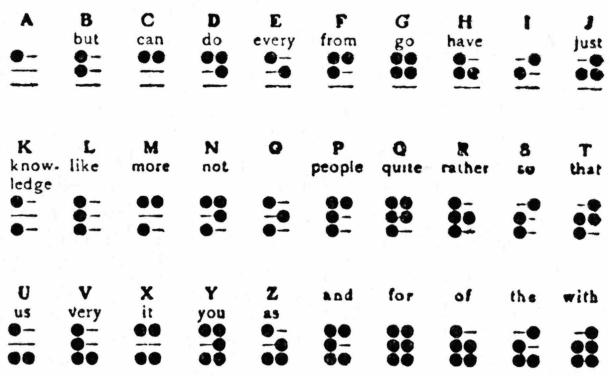


Braid. Method of applying Russian braid to a piece of material marked out with a pattern.

To braid is to bind edges of revers, cuffs, etc., or to

stitch a fine make of braid over a design already marked on the dress or costume, outlining the design completely and forming an effective trimming. This is usually done by machine, but may also be stitched by hand. To do the actual braiding, place the braid on the garment—on the ink lines if a transfer has been ironed off—and sew it down with small running stitches along the groove that runs down the centre, as shown in the illustration. When the design is complete, the material should be pressed from the wrong side. The end of the braid can be made neat by sewing it to the eye-end of a large darning-needle, and pulling the latter through the material to the wrong side. Braids to be used for trimming purposes can be bought in widths varying from ¼ in. to 9 in., and even 12 in. *See* Binding.

BRAILLE. The system of embossed reading and writing most widely used by the blind bears the name of its inventor. Braille has no resemblance to ordinary print. The letters are made up of a combination of dots, the largest number being six, arranged in three pairs. Space is saved by the use of contractions and abbreviations; but, even so, books in braille are very bulky. Much general literature is now in braille type in Great Britain, in addition to several monthly magazines and two weekly newspapers. There is also a free National Lending Library at 35, Gt. Smith St., Westminster, London, S.W., from which books are posted to all parts of the United Kingdom. Full details of the Braille system can be obtained by application to the National Institute for the Blind, 224, Great Portland Street, London, W. *See* Blind.



Braille. Alphabet and contractions which are embossed on paper to enable the blind to read by touch.

BRAIN. The brain is the predominant part of the nervous system, and, like all nerve centres, which originate nerve force as opposed to nerves, which merely conduct it, its activities depend upon nerve cells, of which it contains millions. These are spread out in layers on its surface, and to increase the area the surface is thrown into folds or convolutions. The cells vary in size and shape, and have different functions. The brain is the organ of consciousness and voluntary movements, and definite areas are mapped out for originating movements of the hand, the arm, the face, etc., and for vision, hearing, smell.

Movements on one side of the body originate on the other side of the brain, and in right-handed people the centre for speech is on the left side of the brain. There are other masses of cells at the base of the brain, and in the bulb, or medulla, where the brain becomes continuous with the spinal cord. In the latter are the centres for the functions which carry on the life of the body, heart control, breathing, swallowing, control of the blood vessels, and so on; hence injuries at the top of the spine are likely to be immediately fatal. The lesser brain, lying behind and below the main mass, is mainly concerned with the maintenance of balance.

Injuries and Diseases. Brain abscess is a serious complaint, requiring immediate surgical treatment. The cause may have been originally a blow on the head or an unclean scalp wound, from which the inflammation has extended inwards. A common cause is suppuration in the ear. The symptoms are disturbances of vision, recurring severe headaches, giddiness, and vomiting.

A person who has received a head injury of any severity will suffer from concussion or stunning, with more or less unconsciousness. If this deepens and the patient becomes comatose, breathing in a laboured, stertorous fashion, with flapping cheeks, and a slow, full pulse, which becomes feeble and irregular, it is probable that he is suffering from compression. In compression the body is paralysed, but if the damage affects one side of the brain, there may be, to begin with, loss of movement on the opposite side of the body. For treatment until the doctor's arrival, keep the patient lying in a quiet room with his head low. Apply cold cloths to the head. The condition may last for a long time.

Concussion is the name used to describe the conditions resulting from a blow on the skull, with a sudden shaking of the brain, which may or may not be accompanied by gross damage to the brain. The concussion may result in nothing more than a slight headache, dizziness, and mental "fogginess," lasting for but a moment or two; but in a well-marked, severe case there is loss of consciousness. For treatment pending the arrival of the doctor, the patient should be put to bed, and no effort made to arouse him. Hot water bottles should be put to the feet and legs, and cold cloths on the forehead. As a rule, recovery from concussion is complete.

Cause of Softening of the Brain. Should an embolus or clot block up a brain artery, and so cut off the blood supply, softening of the brain may take place, the part affected dies, and becomes liquefied. Brain tumours may be cancerous, tuberculous, syphilitic, or sarcomatous, etc. Disturbances of vision are common, and there is severe headache with vertigo and vomiting. There is likely to be mental disturbance also. The treatment depends on the diagnosis.

Lethargic encephalitis, also known as sleepy sickness, is an inflammation of the grey matter at the base of the brain mainly, and is due to a microbe. The

disease gets its name from the fact that most of the patients become drowsy. The eyes usually squint, and various nervous disorders, one of them resembling St. Vitus' dance, may be left when the drowsiness disappears. The symptoms are sometimes very slight, perhaps a tendency to fall asleep during the day, and some restlessness at night, with forgetfulness of the little things of everyday life; and the real nature of the condition might be overlooked, with detriment to the future health.

BRAIN FAG. Like all other working tissues, that of the brain may be tired by overwork. There is a difference in the amount of work which different individuals can do comfortably, but the natural capacity of any person may be reduced by a poor supply of blood to the brain or by the blood being of poor quality, as in anaemic states, or being loaded with toxins from the alimentary canal, when the contents of the last named are not moving along sufficiently fast.

A generous supply of blood is not only necessary for the provision of food and oxygen, but to carry off the waste products formed by the working cells. Organs which are acting receive more blood for the purpose, and after a full meal, when the stomach is getting its supply, the brain gets less, and this accounts for the somnolence and dullness of the mental faculties at such a time.

Brain fag comes quickly in the neurasthenic, and may be due to inherent weakness in the brain tissue; but a similar condition may be caused by overwork, especially when associated with worry, though worrying may also be a symptom of brain fag. Other symptoms are loss of power of attention, impaired memory, irritability, loss of pleasure in work and recreation, bodily weakness, perhaps digestive trouble, and a large variety of symptoms.

If the condition is well developed the patient must rest. For prevention we should aim at keeping ourselves physically fit by open-air exercise and other means. The idea that the best rest is a change of occupation is essentially a sound one, but should not be stressed. A sufficiency of sleep is all-important.

BRAINS: Recipes for Cooking. Calves' and sheep's brains are used in cookery, being sometimes bought separately, but usually sold with the head.

Having blanched the brains by washing in salted water until all discoloration is removed, soak them in cold water, then remove skin, wrap them in a piece of muslin, and put into a saucepan with a little onion, a teaspoonful of lemon juice or vinegar, a pinch of salt, a sprinkling of pepper and just enough cold water to cover them. Bring to the boil and then remove the brains and put into cold water until needed. One set of calf's or two of sheep's brains will serve 4-5 persons.

To fry, slice when blanched, and coat the slices with warm butter; then dip into well-beaten egg, cover with breadcrumbs, and fry. Alternatively, dip the slices into a rich frying Matter (q.v.) and fry till a golden brown. Fried either way, the brains may be served with a hot piquant sauce, or garnished with slices of lemon.

Fried brain cakes or balls are useful for garnishing a calf's or sheep's head. To make them, chop the blanched brains up with the yolk of a hard-boiled egg, a tablespoonful of white sauce or cream, a little nutmeg, a little grated lemon peel, a pinch of herbs, and some seasoning. Add enough breadcrumbs to bring it to not too stiff a consistency, and when cool form into little flat cakes the size of a penny, or into balls. Dip them in flour, then in egg, cover with breadcrumbs and fry a golden brown.

For brains served on toast chop one set of calf's brains or two of sheep's rather coarsely, removing any stringy pieces. Whisk one egg until it is slightly frothy, add to it two table-spoonfuls of milk, and stir in the chopped brains, seasoning the mixture carefully. Heat 1 oz. butter in a pan, pour in the egg and brain mixture, and stir briskly with a wooden spoon over a very gentle heat until it becomes thick and creamy. Heap on pieces of hot buttered toast, and sprinkle with chopped parsley.

Scalloped brains make another appetising dish, prepared by cutting up a set of calf's or two of sheep's brains into small pieces, and placing them in a little less than 4 pint of white sauce to which a tablespoonful of cream and a few chopped mushrooms have been added. Season the whole, and put the mixture into 5 or 6 greased scallop shells, sprinkling each with breadcrumbs. Place a small lump of butter on top of each, and brown in a quick oven. *See* Calf's Head; Forcemeat; Sheep's Head.

Brain Sauce. To serve with calf's head boil and chop a set of calf's brains, then add them to a thick melted butter or parsley sauce, well seasoned.

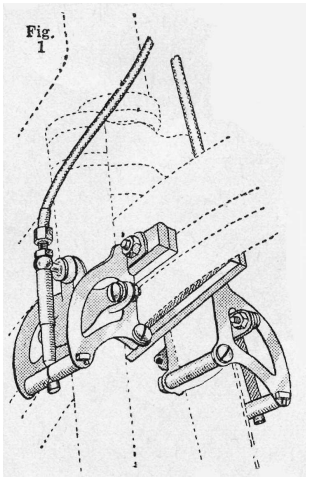
BRAISING. The process of braising can be carried out with success in casserole or saucepan, braising pans being costly utensils.Coals on the top are omitted, and the pan placed in the oven, in order that it may be surrounded by a gentle, even temperature. Braising, an economical method of cooking. develops a specially rich flavour, owing to the bed of mixed vegetables in the pan on which the food is placed. Mirepoix is the correct term for this vegetable mixture. Like stewing, this method of cooking is particularly adapted to meat or birds that, if cooked in other ways, would be tough, dry, and flavourless. No nutriment is lost from it, as the liquid reduces slightly and forms a rich gravy containing the nutritive and flavouring juices that may have been extracted from the food. In some cases it is advisable, if the food is very delicate, to place a piece of buttered paper between its surface and the lid to prevent scorching and drying. *See.* Beef; Casserole.

BRAKES: ON BICYCLES AND MOTOR VEHICLES
Their Mechanism, Fitting and Adjustment

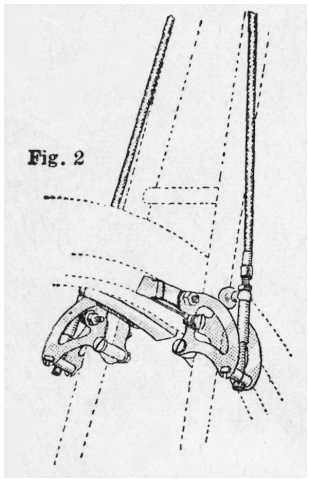
The articles Bicycle; Motor Car; and Motor Cycle should also be consulted. See further Coaster Hub.

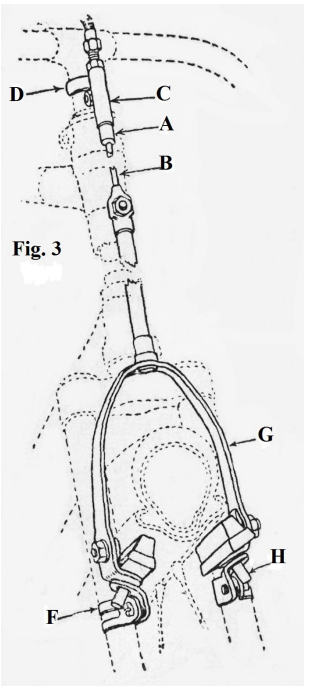
The brakes generally used on bicycles comprise (a)

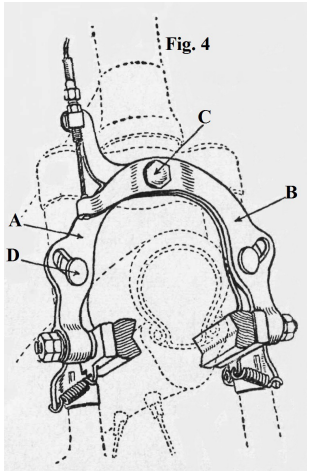
the cantilever front or rear brake (Figs. 1 and 2); (b) the caliper-action brake (Fig. 4) ; (c) back wheel brake fitted on the sprocket bracket (Fig. 5); (d) coaster hub brake. Rim brakes are operated through a system of rods and levers, or by means of Bowden cable control (q.v.).

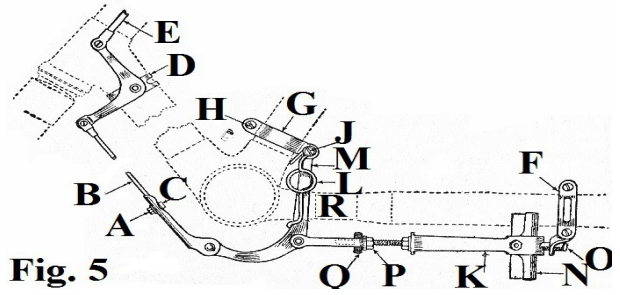


Brake: as used on bicycles. Fig.1. "Cantilever" front brakes with Bowden control Fig. 2. "Cantilever" rear brakes: note independent adjustment. Fig. 3. Older type Bowden-controlled front brake. Fig. 4. Caliper-action front wheel brake. Fig. 5. Brake attached to sprocket bracket.









Brakes of the caliper-action pattern are used where it is desirable to have the pads acting on the side of the rim instead of underneath, as in Fig. 4. Two arms, A and B, are hinged at the top by the pin, C, and the brake pads attached to these arms engage the sides of the rim through the medium of the Bowden wire, drawing the extension arms of A and B together. A stationary U-piece, which is secured to the forks of the machine by means of the usual type of clips, retains the pin, C, in a true line with the wheel, and also carries the studs, D, that keep the arms A and B up to their work. With the back wheel pattern the studs, D, are dispensed with, because the arms, A and B, are kept up to their work by the direction of rotation.

Fig. 5 shows a back wheel brake made for attachment to the sprocket bracket with operating control rods. To fit this pattern proceed as follows: Unscrew the nut, A, and remove the rod, B, from the draw-bolt, C: Fit clip D on the down tube so as to bring tube, E, in line with the head. Fit fork clips. F, on the forks, but do not tighten. Then fit clip G on down tube, leaving the screws, H. and J, loose. Spring the stirrup, K, over the wheel, and place the pegs, Q, into the fork clips, F. The next operation is to adjust the screw, J, so as to leave the swing arm, M, a working fit, and tighten lock nut.

Tighten up screw, H, and carefully note that stirrup, K, lies parallel with the tubes, R, then tighten up lock nut. Now shorten the rod, B, if necessary, and pass it through draw-bolt, C, till there is sufficient tension on spring, L, to force back the swing arm, M; then tighten nut, A. Adjust the pad holders, N, up to within ⅛ in. of the rim by means of the milled nut, O, then lock hexagon nut, P, finally fitting the fork clips, F in position. The stirrup K when at rest must not butt up against the fork clips. A stop is provided on the hand lever by which the position of K should be set as shown. Figs. 3 to 5 illustrate brakes which are most commonly used on ordinary "roadster" bicycles; but the increasingly popular sports or racing models necessitate a severer type of brake altogether.

Fig. 3 shows an earlier type rim brake with Bowden control seen on older machines. Inner tube A is fixed to tension rod B, and outer tube C to clip D. U-piece G, fitted with pins H, passes through clips F.

Coaster hub brakes are sometimes employed in conjunction with a two and three-speed gear. Generally speaking, the coaster hub brake is designed on the internal expanding principle, employing either an expanding bronze ring or an expanding sleeve, the braking power-being applied by back-pedalling.

There has been a fashion recently for brakes of duralumin, not unlike the caliper-action in general principle. The noteworthy point about it is that it is fitted with springs which work from behind the arms of the caliper. But the outstanding development in recent years is the "Cantilever" Brake (Fig. 1), introduced in 1929. It is manufactured by Resilion Co., Ltd., from whom much of this information is obtained. It is suitable for all light-weight models and tandems, and agreement is general that it eliminates all the inherent faults of caliper brakes.

The brake members embrace the forks or seat stays

and are firmly anchored thereto by clamping shields which carry the cable stops and adjusters. Each side is independently adjustable to the rim with the greatest accuracy, and a useful saving of weight is effected by the absence of any bridge work which also enhances the neat, attractive appearance, giving the impression that the brakes are an integral part of the design of the cycle.

It is claimed that one cantilever brake with only 6 lb. pressure on the lever will stop an 11½ stone rider travelling at 16 m.p.h. on a steep slope in 20 yards, against 334 yards in similar tests of other brake-designs. A cantilever may be fitted with cranked levers for right or left hand, to suit the curves of either flat or upturned handle-bars. A cheaper model of the cantilever, with pressed steel quadrants, is nearly as efficient. Its leverages are worked out to give maximum advantage for small pressure on the handle-bar lever, and the brake is particularly suitable for ladies' bicycles because of its light and easy action, or for children's cycles where a small hand is to operate the lever.

Cantilever brakes (for forks ½ in. to 1¼ in.) cost between 10/6 and 14/6; the smaller model (weighing only 14 ounces) is only 7/6. Their sole drawback is the complicated adjustment which is necessary: the wheels must run absolutely true if the brake is to be effective.

Motor Cycles and Motor Cars. (See pages 249 and 250 for diagrams). The various types of brake used on motor vehicles may be classified under the following heads: Internal expanding as shown in the diagram, Fig. 6. External contracting, almost obsolete, but found in some hand-brake layouts. This type of brake, used for parking purposes is arranged behind the gear-box and operates on the propeller shaft. Both contracting shoes and contracting bands are embodied in the design.

In the motor cycle class there are various forms of internal expanding brakes, designed in nearly all cases to give maximum braking power in a forward direction, i.e. the expanding band is operated from one end only, its other end butting against a stop. This type (Fig. 12.) is usually controlled by the Bowden cable or adjustable rod systems. Other types of motor-cycle brakes follow car practice and employ the expanding two-shoe arrangement.

Figs 6 and 7 show the action of the Perrott-Bendix two-shoe internal expanding brake. This is adapted to give a complete servo action both forwards and backwards. Fig. 6 shows the two shoes with their operating mechanism, while Fig. 7 shows the operating mechanism in several positions. The shoes are connected to one another at their lower end by the short link *e,* and their upper ends are expanded so as to engage the inside of the drum by a floating lever, *f,* carrying two small rollers, *g*, one for each brake shoe. The lever, *f,* is adjusted angularly by connecting its lower end to a short arm, *h* , fixed to the brake operating spindle, the outer end of which carries the usual operating lever, *k*. Each of the brake shoes is free to move within narrow limits determined by holes at their ends through which pass with a certain amount of freedom, pins l^1 l^2 fixed to the back or anchorage plate. A spring, *m*, contracts the brake shoes and keeps their ends in engagement with the rollers, *g* , in the usual manner.

The brake shoes are shown in their dis-engaged position at A in Fig. 7, the ends of the slots in the shoes then being forced against the fixed pins l^1 and l^2 by the spring, *m*. When the lever, *k* , is rotated to apply the brakes (B, Fig. 7), it imparts an angular movement to the floating lever, *f*, and the shoes are thereby forced apart until they engage the inside of the rotating drum. Both shoes are carried round in an anti-clockwise direction, their rotation being resisted solely by the pin, l^1, The rotation of the brake drum thus drags round both shoes and increases the force with which they engage.

When the drum is rotating in a clockwise direction, as shown at C in Fig. 7, the operating lever, *k,* is moved as before and turns the floating lever *f*. The two shoes are, however, then dragged round by the drum in a clockwise direction, their rotation being prevented by the fixed pin l^2, the pin l^1 being then out of action. A powerful servo action is thus obtained from both shoes as before. Friction washers, *n* , carried on fixed pins, prevent play of the brake shoes when they are disengaged.

Principle of Front-Wheel Brakes. Fig. 11 shows a front wheel brake. The control rods must be designed so that the brake may be applied irrespective of the position of the wheels; this is carried out by means of a universal joint, D, positioned on the control rod so as to be over the dead centre of the steering head.

With this class of brake it is generally necessary for the point of contact of the tire with the ground to coincide with the point touched by the imaginary lines, E, F, drawn down through the centre of the steering head and wheel. In the figure A is a ball joint allowing universal movement during spring deflection; B is a rod which is a sliding fit in C, the operating tube: E. F, lines meeting at the tire contact point with ground. Front-wheel brakes are without exception of internal expanding design. Often they are cable-operated, as in the Hillman Minx, a typical example of modern practice in front-wheel braking.

Front wheel brakes are more powerful than those operating on the rear wheels for the reason that the retarding force exerted by the road on the moving car causes the weight to be thrown forward, thereby increasing the pressure of the front wheels on the road surface and, at the same time, reducing that of the rear wheels. The more rapidly a car is pulled up the less will be the grip of the rear wheels and greater that of the front wheels; this explains why a modern car can be stopped in less than half the distance required by an old car having rear-wheel brakes only. In addition to the servo-shoe arrangement, other methods are employed to lessen the effort required of the driver

(*Continued in page 251*)

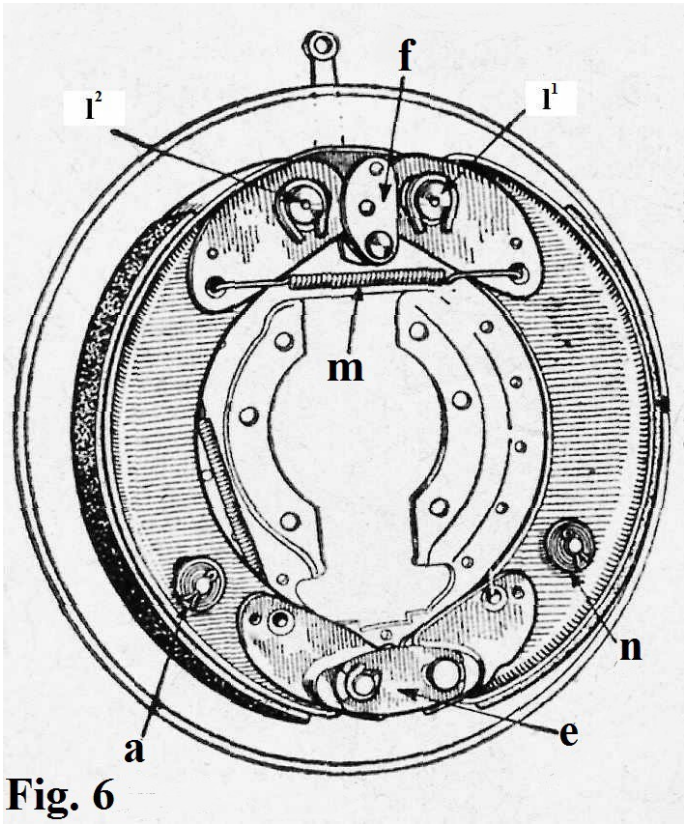


Fig. 6

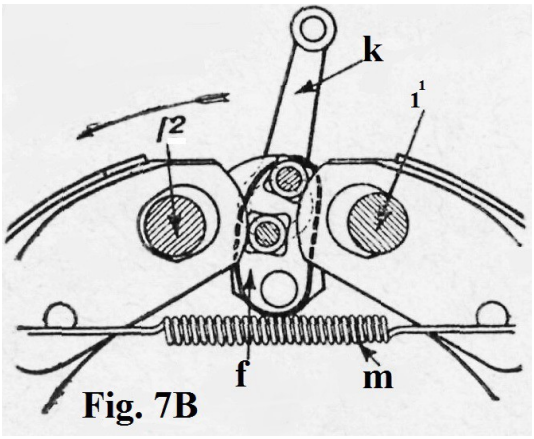


Fig. 7B

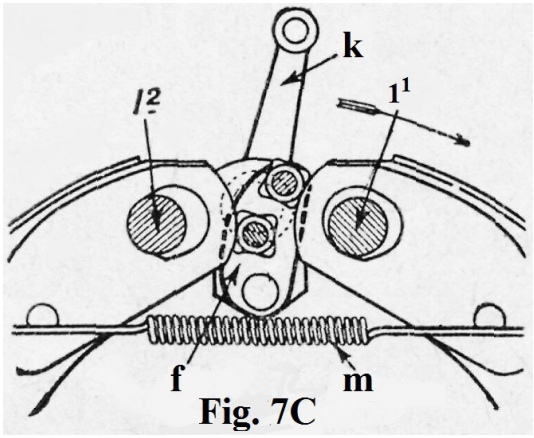


Fig. 7C

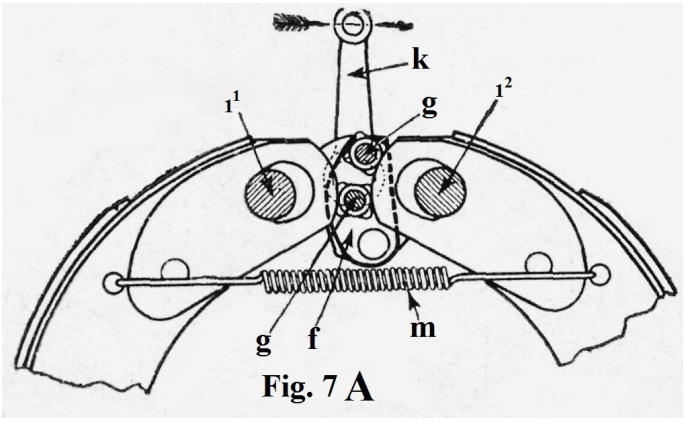


Fig. 7 A

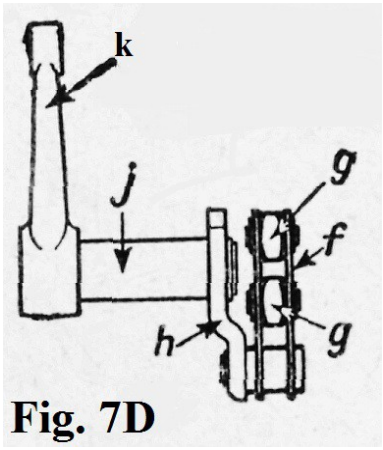


Fig. 7D

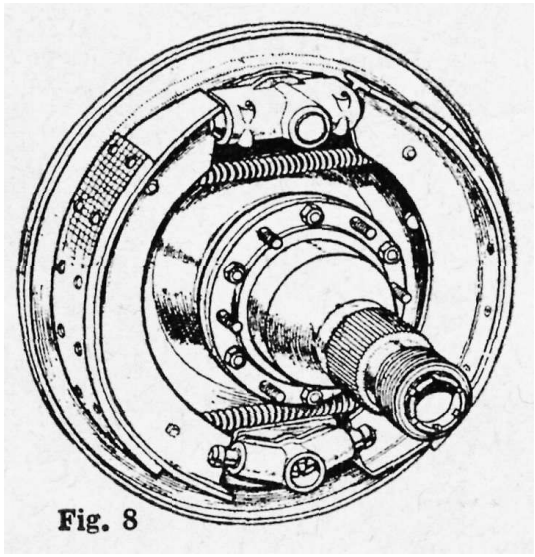


Fig. 8

BRAKE: FOR MOTOR VEHICLES.

Fig. 6. Operating mechanism for Perrott-Bendix two-shoe servo brake.

Fig. 7 A,B,C,D. Mechanism shown in several positions.

Fig. 8. Brake-shoe arrangement in Girling brake.

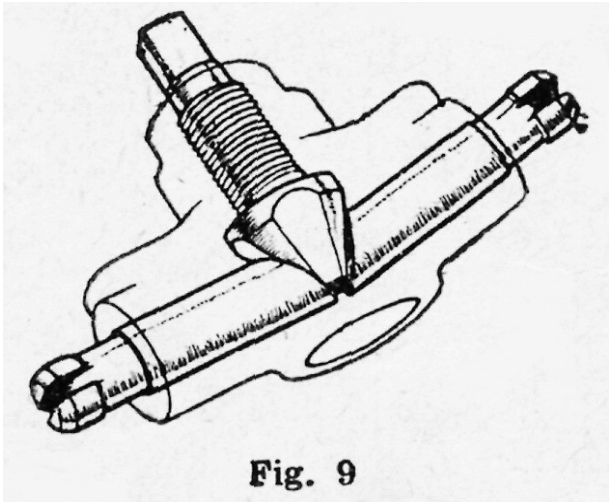


Fig. 9

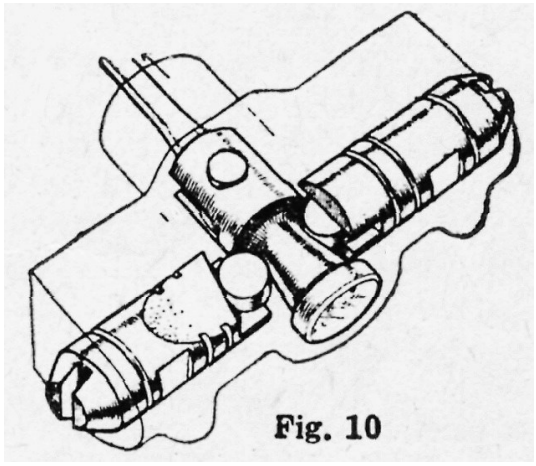


Fig. 10

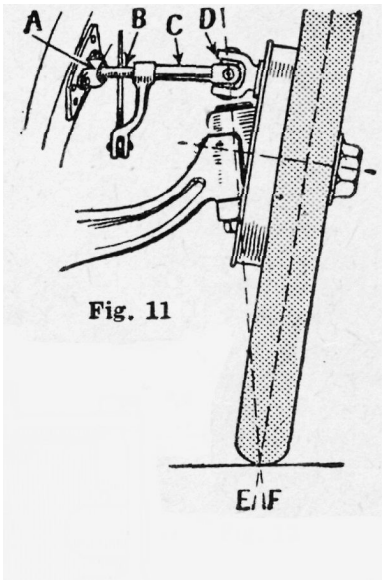


Fig. 11

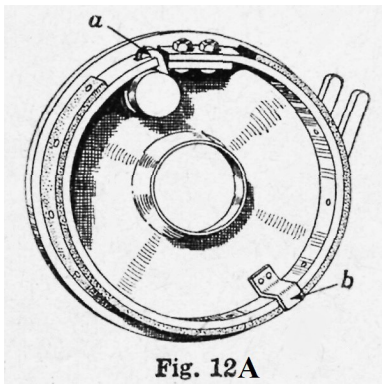


Fig. 12A

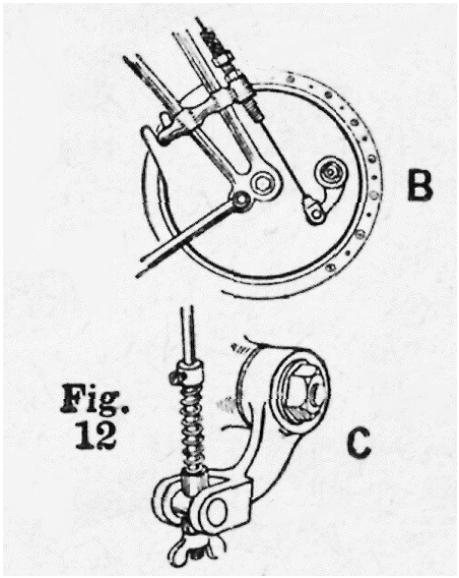


Fig. 12

BRAKE: FOR MOTOR VEHICLES.

Figs. 9 and 10. Expanding wedges and pivots of Girling brake.

Fig. 11. Front wheel brake showing balljoint anchorage A, short shaft B and operating tube C. D. is universal joint fitted to camshaft.

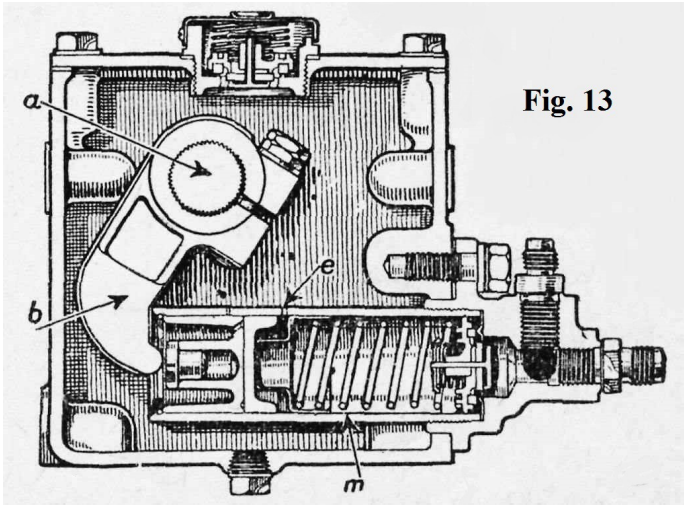


Fig. 13

Fig. 12.A. Internal expanding brake on motor cycles: expanding band operated by a short lever *a*; B. arrangement of internal expanding brake on front wheel of motor cycle; C. lever and pull rod with fly-nut adjustment in motor-cycle brake actuating gear.

Fig. 13. Lockheed hydraulic brake: note pedal spindle a carrying lever *b* bearing on piston *m*.

in operating the brakes, various types of servo mechanism are employed. In the mechanical type a clutch or brake is dragged round by the transmission, and thus caused to apply the brakes. In another type the suction of the engine is utilised to create a vacuum in a brake cylinder. In some brake systems the braking effort is transmitted by hydraulic pressure (Fig. 13, Lockheed brake). This method has become increasingly popular in recent years The system comprises an arrangement of pipes with a "master" cylinder and smal cylinders. The master cylinder contains a piston which, when operated by a pedal, forces fluid through the pipes into the small cylinders. Opposing pistons in the latter are thus actuated and force the brake shoes into contact with the drums.

In what is known as a six-brake system, the pedal works four brakes, and the hand level controls independent sets of shoes in the rear brake drums. Systems in which the pedal controls the four-wheel brakes and the hand lever controls a transmission brake are known as five-brake systems.

Figs. 8-10 show the Girling system, a proprietary brake now incorporated into the design of a number of British cars. A special feature of this is the operating mechanism which gives accurate balance between the brakes on each axle and between front and rear brakes. The balance or "compensation" is obtained by the Girling linkage system: it is "built-in" and practically impossible to upset by maladjustment or neglect. It is used notably in Riley cars.

Brake linings are detachable. They should preferably be fibrous. "Brake-shriek" is due to the design of the brake rather than to the linings. It is uncommon in servo brakes. Remedy it by adjustment of either shoes, pivot or drum.

Unless brakes receive periodical attention, sooner or later they are bound to seize up, the cause of this in nearly every instance being the ingress of water which is liable to get in through lack of oil on the various moving parts. Always keep the brake parts well lubricated, by frequent use of oil or grease. In conclusion, it should be noted that the proper functioning of brakes depends more than is realized on the care of rods or cables.

BRAMLEY'S SEEDLING. This is a very fine cooking apple. The fruit is very large, flat, with a vivid green skin, changing to red on the sunny side, and the flesh is firm, crisp, acid and juicy. Some people eat this apple raw in order to cleanse the palate, but Bramley's seedling is essentially the fruit for tart, pie, or dumpling. It is best as a standard on a rather heavy clay soil. The fruit is ready to pick first of all in November, but with careful storage will keep till May or June. *See* Apple.

BRAN. The outer husk of the wheat grain, bran can be bought at little cost from any corn-chandler. It is used as a feeding stuff for horses and cattle, is one of the staple foods for rabbits, and is mixed with the meal in the fowl's warm mash.

It is often employed for packing, and is especially suitable for glass and china or other fragile material. A bag lightly packed with bran and warmed in the oven for a few minutes retains its heat, and is a substitute for a hot-water bottle.

Bright-coloured materials, cretonne, chintz, shantung, etc., will not fade if washed in a bran bath. To make one, about ½ pint of bran is required for every 2 quarts of water. Sew the bran into a bag of fine muslin, leaving plenty of room for it to swell, and put it, with the water, into an enamel-lined or aluminium saucepan. Bring to the boil, and stew for about ¾ hour. Then pour off the water, fill again with cold, and stew once more for a shorter time.

As the bran softens the water, soap is unnecessary except for very dirty articles. The material is put into the first bran water. It should not be rubbed, but squeezed between the fingers, and put, when clean, into the basin containing the second brew. Rinse it finally in tepid water. No white or delicately coloured material should be washed in this way, as the water is tinted. The bran can afterwards be used instead of tea-leaves for keeping down the dust when the carpet is being swept. *See* Packing; Poultry; Rabbit.

BRANDY. This spirit is best drunk with plain water rather than with soda or any sparkling mineral. Hot brandy and water is an excellent "night cap". The finest liqueur brandies are drunk neat at the end of dinner after black coffee, being served in a large glass, convex towards the lip, and not filled to the top. Fifty years old is a sufficient age for a good liqueur brandy.

Medicinally brandy is used as a restorative in cases of temporary faintness, and a further use for it is found in the later stages of acute febrile diseases when the patient's powers are waning, e.g. in pneumonia, enteric fever, influenza, etc. Then a tablespoonful may be given every hour or two, in milk, and as much as ½ pint or more may be taken in the 24 hours. As a quick stimulant in an emergency, a teaspoonful of brandy in one or two tablespoonfuls of champagne is very effective. *See* Alcohol; Cherry Brandy, etc.

BRANDY BUTTER. This thick sauce may be served with plum pudding. Beat up 4 oz. butter to a cream, then add castor sugar until it is stiff and rocky, a few drops of vanilla, and a little liqueur brandy. Pile up in a glass dish. It is best made a few hours before it is wanted, and left in a very cool place until served.

BRANDY SAUCE. To make a sauce, which is often served with pudding, melt 3 oz. of loaf sugar in about ½ pint of water, and boil until syrupy. Add to this about a dessertspoonful of cornflour mixed into a creamy paste with water, and stir until it boils. Add about half a wineglassful of brandy before serving.

BRANDY SNAP. To make these biscuits take 6 oz. each of flour, butter, sugar and cane syrup, to which should be added ¼ oz. ginger and a few drops lemon

lemon juice. Melt the butter, syrup and sugar together in a pan, and then stir in the sifted flour, the ginger, and the lemon. Pour the mixture into small rounds on a greased baking-tin and bake about 10 min. in a moderate oven. Roll them up when just cool enough to handle.

BRAN TUB. A tub full of bran, in which are concealed a selection of small toys, brightly-coloured bags of sweets, oranges, apples, or any other gifts is an old-fashioned but still popular amusement at children's parties and at garden fetes. If the tub is a deep one, a thick layer of bran is put at the bottom before any toys are introduced, so as to bring them within the reach of small arms. The tub is then filled with alternate layers of bran and toys, bran being on top when it is full. The children plunge a hand into the tub and pull out the gift they touch first. *See* Children's Party.

BRASS. One of the most useful of metals, brass is obtainable in rods, sheet, or tube. It is easily turned, filed, or soldered, takes a high polish, and can be coloured without difficulty.

Brass wire is sold in coils, from very fine to quite stout rods. Round stuff can be bought in drawn rods, with a clean and bright surface. Cast rods are rough and of little use to the amateur. Strip brass is the most convenient form in which to buy flat material up to 2 or 3 in. in width and 1 in. in thickness, down to 1/16 in. wide by 1/32 in. or less in thickness. Tubes are solid drawn and sold according to their outside diameter, and are stronger than the brazed tube commonly employed for gas-fittings. Brass-cased tube is made of iron covered on the outside with a thin layer of brass, and generally used in cheap bedsteads and for curtain rods and poles. Circular brass blanks from 1 in. to 4 in. diameter and 1/16 to ¼ in. thick, as well as screwed brass rod, and brass gears of all kinds, are valuable aids to the home-worker.

Brass castings are extensively employed. Soft sheet brass, which can be readily hammered, is used for repoussé work, and can be cut with a fret-saw. Many stock patterns of pierced brass are obtainable. As brass does not rust, it should be employed for screws and hinges in damp places. For electrical work it is extensively used, being a good conductor.

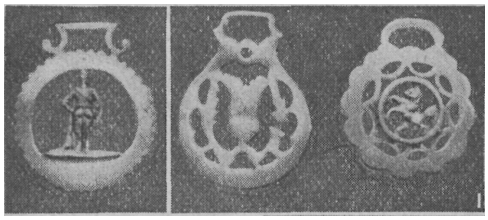
How to Lacquer Brass. The cleaning of brass is an everyday task in most homes, much of which could be avoided by lacquering especially with such articles as door handles, fenders, and the like. The brass is first thoroughly cleaned and a mixture of paraffin and whiting is applied as a paste. Very dirty brass can be cleaned with a dilute mixture of nitric acid and water or sulphuric acid and water.

When mixing the sulphuric acid it must always be poured slowly into the water; the water must never be poured on to the acid or an accident may result.

Boiling in strong soda-water also cleans ordinary brass-work. The work to be lacquered must be polished brightly, frosted or otherwise finished; it is then dipped into a hot bath of dilute soda water, rinsed in cold water and dried off in hot dry sawdust. This is to remove all grease. The work should not be touched with bare hands, but a piece of clean tissue paper should be used.

The next step is to heat the work evenly but slightly, and a film of moisture will form on the brass. Directly this disappears the lacquer is applied with a clean camel-hair brush in one even coat. The work must not be touched twice with the brush or it will be spoiled. The article is then turned about over the heat from a gas burner until it is dry, and set aside to harden off. Lacquer is obtainable in crystal or colourless; pale gold, which imparts a slight colour; or deep gold, as usually applied to domestic articles. If the crystal lacquer is used it will be absolutely invisible to the eye. Under normal conditions lacquer stands for a year or more without any other attention than that of an occasional dusting. *See* Ash Tray; Brazing.

BRASS COLLECTING. Examples of old brass work, which are within ordinary reach, belong to the last three centuries. They include caldrons and skillets, snuffers and candlesticks, mortars and door-stops, trivets and chestnut roasters, tinder-boxes and ember tongs, andirons and fire brasses, ladles and furniture handles, warming-pans and foot warmers, lantern clocks, trinket boxes, and table bells. Such objects enhance, when used with decorative discretion, the effect of lounges and halls furnished in oak or mahogany, with leather upholstery or deep-tinted tapestries, and self-coloured walls.



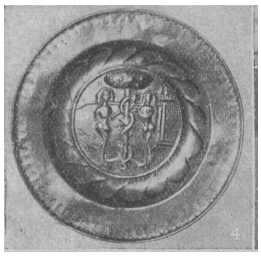


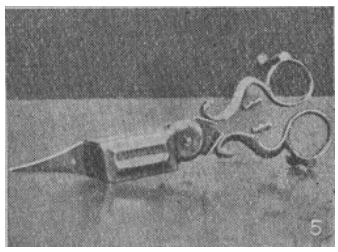


Brass Collecting. 1. Horse amulets. 2 and 3. Figures made by brassworkers apprentices on completing their apprenticeships.

Much continental hammered brassware, collectively called dinanderie, has for centuries been made round

about Dinant in Belgium. It includes coffers, platters, and Dutch tobacco-boxes with Biblical scenes based on old wood-cuts. The modern work is often poor in material and execution, but good examples are to be had.





4. Alms-dish, with design of Adam, Eve and Serpent; early 16th cent. 5. Candle snuffers, 18th cent. (1, 2, 3 and 5 from the collection of Sir James Yoxall; 4. by courtesy of Fenton & Sons.)

Oriental brass is best associated with eastern carpets and related colour schemes. The domestic brassware of the Hindu kitchen, whose unornamented surfaces are burnished daily, generally present delightful forms; such are water-bottles or lotas, both large and small, wide-mouthed milk bowls and shallow rice-dishes. Images of Buddha or of Indian deities, if not placed in trivial surroundings, may be displayed with one or two pieces of solid hammered Benares ware.

A good deal of modern English brass, including some which is spun or stamped by machinery, is in good decorative taste. The production of replicas is a thriving industry, and if they are of honest fabric and sold at their face value only they have ornamental uses. Spurious old brass is harder to detect than any other class of counterfeits.

Medieval brass is hardly possible to acquire except in the auction-room. It comprises pattens and alms-dishes, pilgrim signs and curlew hoods, astrolabes and sanctuary rings. Of a later age perforated horse-amulets, of which there are more than 1,000 designs, including rayed suns, horned bull's heads, and crescents, are charming in form and decoration. A full set of these harness-trappings consists of a face-brass, two ear-pieces, six shoulder ornaments, and six or ten metals for the martingale over the chest.

Stuart and Georgian pipe-stoppers, fob-seals, and other objects with engraved bases may still be met with in out of the way places. They frequently simulate or caricature the features of famous men of the day. There are also miniature reproductions in brass of period furniture, such as Chippendale tables, grandfather chairs, and the like. Some collectors specialise in old door-knockers, whose designs may be arranged to illustrate the development of taste. Gorgon-heads and other grotesque forms, derived from ancient sanctuary rings, are favourite designs for miniature knockers.

Delightful figures—they are hardly statuettes—were produced in the 18th century for the finials of door-stops and fire-dogs. They were often in pairs, such as peacock and pheasant, boy with dog, and girl with rabbit; besides groups and various national and allegorical figures.

Brass should be kept dry by regular leathering. Unpleasing stains may be removed with chalk moistened by spirits of turpentine; deep-seated tarnish will yield to weak oxalic acid applied by a rag, followed by washing. and drying with whiting. Liquid polish serves for large surfaces, such as warming-pans, but if used for perforated or hammered surfaces deposits must not be left in the crevices. *See* Benares Ware.

BRASS-BACK SAW. Small brass-back hand saws are used for cutting thin, soft sheet metals and tubes, such as brass, copper, or pewter. They are inexpensive, and are useful in the home workshop, being preferable to a hacksaw for cutting brass tubings. S*ee* Saw.

BRAWN: How to Prepare. Take half a fresh or salted pig's head, 1 carrot, 1 small turnip, 12 peppercorns, 4 cloves, 1 blade of mace, 1 sprig each of thyme, parsley and marjoram, and some salt and pepper. The pig's head should be well washed in tepid water, rinsed, and put into a saucepan with sufficient cold water to cover it. Bring slowly to the boil and skin carefully ; then add the vegetables, which should be cut into small pieces, the herbs and seasoning. Simmer the whole slowly until the flesh leaves the bones easily; then strain the liquid into a basin and put the head on a dish.

The meat has now to be cut from the head into small pieces and the tongue into thin slices, removing any skin or gristle. Return the liquid, skimmed of all fat, to the saucepan with the bones from the head. Boil quickly till reduced to half the quantity, then strain over the meat. Season again if necessary with pepper and salt. When slightly cooled pour into wetted moulds and set aside to get cold and firm. Turn out to serve and garnish with parsley. The time required for boiling the head depends upon its size, one weighing 6 lb. taking from two to three hours.

The inside of the moulds may first be decorated with some hard-boiled egg cut into thin dice or small fancy shapes.

To make spiced brawn, use 1½ lb. of lean beefsteak and a small pig's head which has been in pickle for a week. Place the meat and the head in a saucepan and cover with cold water. Bring to the boil quickly, skim well and simmer for 3½ or 4 hours. Then strain off the liquor, remove the bones, and chop the meat finely. Season the brawn with cayenne pepper, salt and a little allspice. Make the meat moist with a little of the liquor carefully freed from fat, and press it into a plain round mould with a heavy weight. It can be turned out next day.

For veal brawn take a knuckle or any bony piece of veal and wipe with a clean cloth, removing any fragments of bone. Put the meat into an enamelled saucepan, cover with cold water, and bring it to boiling point. Skim the liquid well, add an onion, stuck with cloves, and a teaspoonful each of salt and pepper.

Simmer very gently till the meat comes off the bones and the gristle is nearly melted. Having taken out and boned the meat, chop it into small pieces, add two or three hard-boiled eggs cut into slices, and season the dish lightly with salt, lemon juice, and chopped parsley. Arrange all in a mould. Pour a little strained stock over it and set it aside to cool.

Calf's head brawn is useful, and if a little care is taken in arranging the pieces of egg in the top of the mould, it can also be made ornamental.

Take about 1 lb. of boiled calf's head (q.v.) and ½ lb. of boiled ham or bacon, and cut both into neat dice. Shell and cut three hard-boiled eggs first into thick slices, and then cut the latter into quarters. Arrange pieces of the egg in any pretty design at the bottom of a plain mould or basin, and then fill up loosely with layers of the head, ham, and any egg that remains. Between each layer sprinkle in a little seasoning, made by mixing 1 teaspoonful of grated lemon rind with 2 teaspoonfuls of chopped parsley and salt and pepper.

Heat ½ pint of the liquor in which the head was boiled. This should be a stiff jelly, but if it is not, reduce by boiling without the lid to about two-thirds of the original amount. Dissolve in this stock 3 sheets of gelatine, but do not let the liquid boil. Then strain into the mould till the latter is full, and put a plate on the top of the mould with a weight on it. Leave until cold and set. Wipe off any fat that may be on the top, dip the mould into hot water to loosen the jelly from it and turn the shape out on to a dish, garnishing with tufts of washed cress or lettuce.

Fish and Vegetable Brawns. For fish brawn the ingredients are some white fish and the bones of a rabbit or chicken or some veal bones. It needs also a little onion, pepper and salt, some chopped parsley and hard boiled eggs. Cover the bones well with water and stew them well and slowly, adding the pepper, salt, and onion before straining. Decorate a mould with a little chopped parsley. Fill half full with alternate layers of flakes of cold fish and hard boiled eggs in slices. Then strain in the stock gently till the mould is full. When cold turn it out. It should be served decorated with parsley.

Egg and vegetable brawn can be made aa follows: Boil 2 eggs hard and slice them. Make some clear stock with a few bones, strain it through muslin, and to each pint of stock add ¼ oz. gelatine. Arrange in a wetted mould the slices of egg, some slices of tomato and cold potatoes, and season with pepper and salt. After putting in one layer of these add a little of the stock in which the gelatine has been dissolved. When set add another layer of eggs, etc., and continue the process until the mould is full.

To make rabbit brawn, thoroughly clean a rabbit, cut it into joints, and let it simmer gently for 2 hours. Then take the meat from the bones, and cut it into small pieces. Arrange these in a plain, round mould with 2 hard-boiled eggs and ¼ lb. cooked ham, cut small. Add to 1 pint stock ½ oz. gelatine, and dissolve it very thoroughly. Pour this over the rabbit and turn it out when cold.

BRAZIL NUT. Imported into Great Britain from South America, the Brazil nut is a favourite for dessert. The kernel yields an oil used by artists and watchmakers.

Brazil nut cutlets are made from 4 oz. breadcrumbs, the white of one egg, 3 oz. skinned Brazil nuts, ½ pint white sauce, 2 teaspoonfuls mixed herbs, and a pinch of powdered mace. Put the breadcrumbs and nuts through a mincer, add the herbs, and mix all with the white sauce. Beat up the white of the egg to a stiff froth and add it lightly to the mixture. Shape the whole into cutlets and fry in hot fat; then drain and dish on a doily, garnishing with parsley before serving.

BRAZING. Brazing is a method of uniting metal parts by means of a film of brass in the form of alloy, known as spelter. Metals that are usually brazed together are steel, wrought iron, brass, and copper. Cast iron is not usually brazed, as better results are obtained by autogenous welding.

The various stages in brazing are as follows: Thoroughly clean the parts to be brazed, apply a suitable flux to the joint, then assemble the parts, and secure them so that they cannot move relatively during the brazing operation. Next apply the spelter to the joint. Heat the work thoroughly until the spelter runs or melts and unites with the metal parts. Finally clean the job, and remove any scale or surplus spelter.

The tools and materials required are a powerful brazing blow-lamp, or preferably a gas blow pipe supplied with air from a foot bellows, a stout iron pan on legs, and filled with coke or lumps of asbestos, some spelter, borax in powder form, and a few rough pliers or tongs for holding the work while brazing. Some soft iron wire and a packet of brazing pins are needed to secure the parts, unless they are screwed or driven tightly together so that they cannot move while being operated upon.

A simple example is to braze a steel tube into a steel socket. Clean the joint thoroughly by polishing with emery cloth, or by filing or grinding, and paint it with a solution of powdered borax. Now force the tube into the socket; there is no fear of its being too tight, as the brass will run into the joint although there is apparently no room for it. The danger is in having a slack joint. A brazing peg has next to be inserted. For this purpose drill a hole through the socket and tube, insert the small end of the peg, and drive it in hard with a light hammer.

Use of the Blow Pipe. Now place the work on the brazing pan and pack asbestos cubes around the back and sides, leaving space for the burner flame. The idea is to retain as much heat around the joint as possible. Light up the blow lamp or gas blow pipe, adjust the flame to burn clean, that is, without yellow streaks or any trace of smoke. Move the lamp about so that the flame warms up the asbestos and the metal generally.

Watch the borax or flux around the joint, and directly this begins to bubble and turn white, apply the spelter to the joint. Spelter is obtainable in granular form, like brass filings, and can be mixed with an equal proportion of powdered borax. In this state it is applied to the joint with a metal rod. Heat the end of this rod, dip it in the spelter, and sufficient will adhere. Apply this to joint and as much more as is needed.

If spelter is bought in the form of brass wire it is roughly square in section and sold in rolls. Cut off a few feet and coil up one end, then heat the other and dip it in the powdered borax, a globule of which will adhere. Then heat the work steadily and thoroughly, at the same time melting off a piece of the spelter wire, or brazing wire, as it is usually called. Push this with the end of the rod into its place, or as near as possible; continue to heat the work, apply a little more flux from time to time to prevent the surfaces oxidising, and watch for the spelter to melt. When it begins to melt, watch where it runs. It should disappear into the joint. Spelter will follow the heat and the flux, and will not adhere to the metal except where the flux has been applied. Be careful not to inhale the fumes given off during the brazing process.

To be sure of the job being a sound one, it will have to be turned over. When one side is brazed, keep the flame on the work so as not to lose the heat, and turn the work over with the tongs. When satisfied with the job, turn off the blow lamp flame, and allow the work to cool off before touching it. When it is black hot, take it from the pan, holding it with tongs, and with a wire brush remove all surplus flux and scale: being in a plastic state it should brush off easily. When quite cool, the scale has to be cleaned off, by pickling in a weak solution of sulphuric acid and water. The pickle should be made in an earthenware or glass jar and preserved for future use. Leave the work in the pickle for an hour or so, then wash it in hot water, and file and polish until the metal is clean and bright. If feasible, run some oil or paint into the interior of the pipe to prevent it from rusting.

The secret of success in brazing is clean work at the start, sufficient heat applied in the right place, and to see the spelter run nicely and freely. On some work the spelter and borax mixture can be applied direct to the work and then heated, but generally on all steel or iron parts the brazing wire is the best.

Brass and copper are brazed in the manner already described, but call for more care and skill on the part of the operator. The brass has to be heated to a dull red heat before the spelter will run, and at that heat the brass itself is on the verge of melting. It is best to use a soft spelter strip or specially prepared white spelter, as this melts at a lower temperature than ordinary brazing wire. The same care is needed at all stages of the work. Much small brasswork is, however, joined by a process known as hard soldering or silver soldering. *See* Brass; Soldering.

BREACH OF PROMISE. An action for breach of promise of marriage can be brought by a man who has been jilted, but almost invariably the plaintiff is a woman. The lady must prove that the defendant promised to marry her. The promise need not be in writing or words but may be presumed from conduct. The plaintiff's word and oath alone are not sufficient to establish a case. She must be corroborated; and this corroboration generally takes the form of love-letters; an engagement-ring; evidence that the lady was introduced by defendant to some other person as his fiancée.

It must be proved that defendant had broken his promise. This he may do by breaking it off formally; or by getting engaged to or marrying someone else; or by neglecting to marry the lady within a reasonable time. For a promise to marry means to marry within a reasonable time.

The damages recoverable are practically whatever the jury like to award. They generally give the plaintiff anything she is out of pocket for trousseau and the like; something for injured feelings; and something for what may be called the value of the match. A promise by a minor (under 21) to marry is void; but if he makes a fresh promise after he is 21 he may be sued if he breaks it. *See* Engagement; Marriage.

BREAD AND BREAD MAKING
Essential Facts for Every Housewife

This entry is followed by several dealing with various uses of bread, and by other relevant headings, including Bread Basket; Bread Cutter, etc. See also Baking; Diet.

The necessary ingredients for household bread are flour, yeast, sugar, salt, and warm water. For small loaves, rolls, etc., baking powder may take the place of yeast, and butter, milk and eggs may be added. As a rule, ½ oz. yeast, a teaspoonful each of sugar and salt, and rather more than a pint of water are used to 1 lb. flour. The same proportions are employed for brown bread, but wholemeal flour is substituted for ordinary white flour.

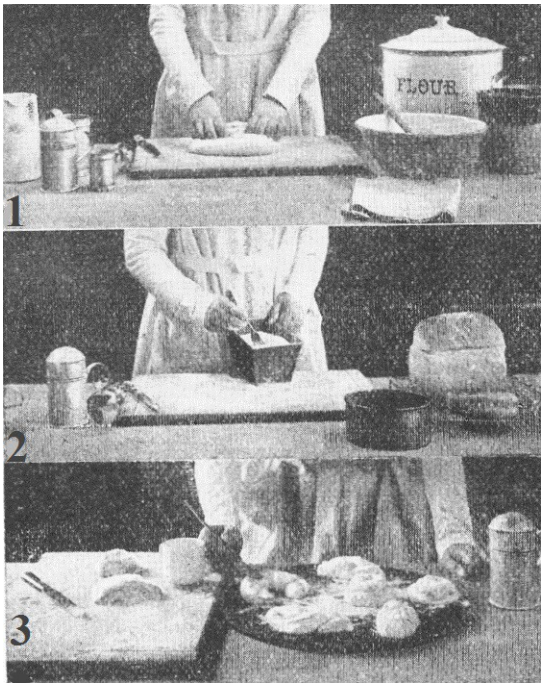
The method of preparing household bread is as follows. Mix yeast and sugar well together, add a tablespoonful of tepid water (tepid being ⅓ boiling water and ⅔ cold), cover basin with a clean cloth and stand in a warm place until yeast is well risen and frothy. Meanwhile, measure flour into a basin and warm it, either in front of the fire or on the rack above the range. When yeast has frothed, pour it into a well, made in centre of flour with a warm wooden spoon, and sprinkle a little of the flour over it and a teaspoonful of salt round edges of flour. Cover basin with a cloth, put in a warm place and leave until yeast has cracked well through flour. Stir in gradually the tepid water, preferably with a warm palette-knife, and the mixture is ready for kneading.

Kneading presses the yeast cells between the grains of flour, and by it the dough is rendered smooth and elastic. A warmed board, lightly sprinkled with flour, must be used. Turn dough on to this and knead (i.e. rub firmly together and pound) with both hands. The

success of the loaf depends largely upon the kneading, and a light, firm touch with dry, warm hands is essential. When the dough has become smooth and elastic turn it again into a warm basin, cover, and set to rise in a warm place until it has at least doubled its size. This takes about 2 hours. Then turn once more on to board and knead quickly and lightly before forming into loaves. These may either be stood upon a large, floured baking tin or small floured bread tins may be used. This done, let the dough stand (or prove) in a warm place for 20 min. It should always be remembered that uniform warmth is the secret of yeast bread. If raised in too cool a place a very close consistency will result; if too hot, a solid cake of flour will follow, or loaves with large holes in them.

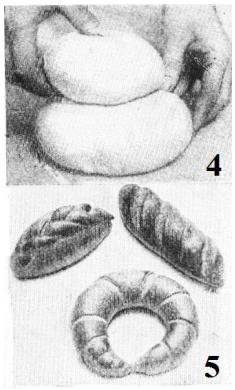
During the time of final proving the oven must be made very hot. All yeast bread must be baked in a very hot oven at first, to kill the yeast. After the bread has risen still further, and browned, the heat may be gradually reduced. Allow about 1 hour for baking a half-quartern loaf and ¼ to ½ hour longer for a quartern loaf. When the loaves sound hollow on being tapped briskly underneath, they are done. They should be cooled on wire trays and turned upside down.

How to Make French Bread. French bread is made with Vienna flour. Milk is added to the yeast and sugar instead of water; tepid milk and sometimes a little beaten egg is employed to mix the dough. Kneading, rising, proving, etc., must take place as previously explained, and after forming into plaits, rolls, etc., the dough must be brushed with beaten egg and allowed to rise again for ten minutes. A very hot oven is again needed. Small fancy twists and rolls usually take about 15 min. to bake.



Bread and Roll Making. 1. Kneading the dough. 2. Pricking dough in baking tin. 3. Glazing rolls.

Any good pastry flour can be used for fancy bread. Currants, sultanas, or a pinch of mixed spice or cinnamon may be added if desired.



4. Placing top on cottage loaf. 5. Milk rolls in fancy shapes. (1, 2, 3, and 5, courtesy of Country Life, Ltd.)

Three rolls of a richer variety are illustrated in Fig. 5, two of which are dealt with in the text. To prepare, sieve together in a warmed basin ½ lb. flour and ½ teaspoonful salt, rubbing into them 1 oz. butter. In another warmed basin mix a little less than ½ oz. yeast, with ¾ teaspoonful castor sugar; then warm up ¼ pint or less of milk, adding to it a small, well-beaten egg. Pour the latter mixture into the yeast and sugar, mix all well, and then add the whole to the flour and salt. Beat up all these ingredients, and put the covered dough in a warm place to rise for about one hour. When it has risen, divide it into four portions, and from one of these make a plait roll. Divide the piece into three equal parts, rolling each until it is about 5 or 6 in. long.

Pinch these strips together at one end before plaiting them, and finish the bottom in a similar manner.

The horseshoe roll is made by forming a portion of dough into a triangle and, taking the longest side, rolling it over to the point. Twist the roll to form a horseshoe, and cut it across the top in several places with a knife. The roll with a plaited effect on top is made by dividing a piece of dough into two unequal portions, and placing the smaller part, plaited in the way already described, on top of the larger piece, shaped to form an oblong. Let the rolls rise in a warm place for 20-25 min.; then brush them over with milk, and bake them for about quarter of an hour.

Method of Making Aerated Bread. Aerated bread is so called because the bread is raised by means of the carbonic acid gas given off from baking-powder when moistened. It is made as follows: Take 1 oz. baking-powder and ¾ oz. salt to every 2 lb. flour, incorporating the salt and baking-powder well into the flour before moistening. Pour about a pint of water into the centre of the flour and make it quickly into a dough.

Divide it into loaves and brush over with milk. Put the loaves into the oven immediately. No time must be lost between the moistening of the flour and getting the loaves into the oven, otherwise part of the aeration will be lost. Bake in a quick oven for about half an hour.

Bread raised with baking-powder is made by simply rubbing fat into the flour and adding salt, baking-powder and sugar. The dough is mixed with water or milk (the latter preferably sour) and when formed into rolls or small loaves should be brushed with beaten

egg. Ten minutes in a hot oven is sufficient for small baking-powder dinner rolls or loaves. To make these rolls, sift with ½ lb. fine flour ¾ teaspoonful baking-powder, and ¼ teaspoon-ful salt into a basin. Rub in 1 oz. butter and mix all into a stiff dough with 1 gill sour milk or water. Divide it into 6 equal portions and make these up into round rolls. Bake them about 10 min. and serve them hot. These rolls can be made suitable for tea if the butter is increased to 2 oz. and a like quantity of castor sugar added: also, if an egg its beaten up and added to the liquid when mixing up the flour.

Value of Wholemeal Bread. Wholemeal bread, which includes all the bran, may prove indigestible for some people, or may even produce irritation of the digestive tract. But those who can digest it receive additional nourishment, including a much larger portion of organic phosphates, which are indispensable to the chemistry of the body. Also, in wholemeal bread we retain tlie vitamins which are so necessary to growth.

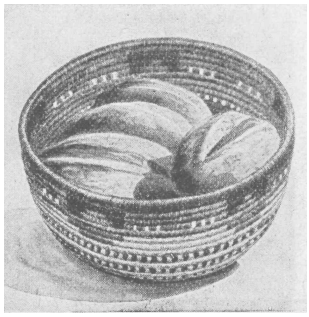
Without a doubt, wholemeal bread is the bread which should be supplied to children. Among the well-to-do the deficiency in vitamins and organic phosphates may be made good by other articles in the diet, such as butter, eggs, and fresh vegetables; but children who are brought up on skim milk, margarine, and white bread are starved of things necessary to their proper growth, and rickets and ill-defined forms of disablement may result.

With regard to the irritating effects of wholemeal bread on the intestinal tract, this may be in many cases the stimulus required to produce a proper movement of the bowels and prevent or cure constipation. New bread is apt to be indigestible; it is better to use it a day old. The proper toasting of bread makes its digestion easier; but this does not apply to hot buttered toast, on which the butter has been made less digestible by heat. If butter is used, it should be put on when the toast has cooled.

In diabetes it is necessary to limit the amount of starch in the patient's diet, and starchless bread is sold for this purpose. It is made from gluten, the sticky substance in dough, bran, casein, the proteid in milk, curd, nuts, and almonds. Some samples are quite free of starch, but others contain more or less of it. Such bread should be bought of a reliable maker to ensure its being what it is represented to be.

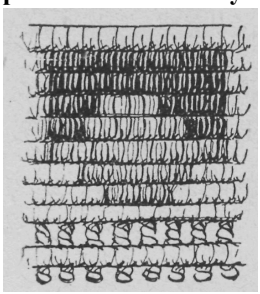
BREAD AND BUTTER PUDDING. To prepare this, butter a pie-dish and sprinkle currants or sultanas or spread a little jam or marmalade on sufficient slices of bread and butter to half-fill the pie-dish. Beat 2 eggs to a froth and mix them with a pint of milk and a tablespoonful of white sugar. Pour in this custard and let the bread soak in it for half an hour, or until it is soft. Stand the pie-dish in a deep baking-tin with water round the dish, and bake the pudding slowly till set and browned lightly. The water round the dish together with the slow baking prevent the custard from curdling.

BREAD BASKET. The craftworker can make the raffia bread basket shown in Fig. 1 with one bundle assorted colours and ½ lb. natural raffia. It measures 8 in. across when finished and is bordered with blue, orange, white, brown and black raffia.



Bread Basket. Fig. 1. Basket woven in raffia in several bright colours.

Thread a raffia needle with a strand of natural raffia and take six more threads level at one end. Bind these together with the first, taking eight or nine wraps over from front to back. Now coil into a small ring, ¼ in. in diameter, to begin spiral for base. going in a left-hand direction. Take a few wraps with needle-strand round the ring and coil and then make a knot-stitch, by bringing the needle through from the back between the coil and the ring on the left of the last stitch. Then take it across front of this stitch and pass needle through on the right of this stitch, bring it round to left again, between ring and coil. This part of the process is finished by taking needle round coil.



Bread Basket. Fig. 2 (left). Design of the raffia weaving.

Make a long stitch, by taking needle through centre of ring from the back, then over coil, as before, and make another knot-stitch. Continue the operation in this way until the one row is completed, then thicken foundation coil by adding a few more strands to make it ¼ in. thick.

When the base is 6 in. across, gradually raise the coil to form the first row of the side of the basket, and make each succeeding row a trifle wider, until the sixth row gives a diameter of 8 in. to the bread basket. Care-fully watch the shaping and see that the sides are well balanced.

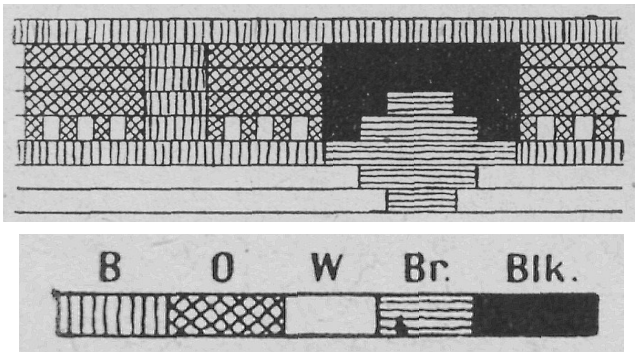


Fig. 3. Chart showing colour schemes.

The border is now begun with "original weave" instead of knot-stitch. For this take the raffia round the coil and insert the needle under one of the stitches in the previous row, thus securing the loose coil to the basket. Point needle in slanting direction to left when inserting, and then proceed to make every stitch in patterned border in this manner.

The design is shown in Fig. 2. It is built up by use of the colours, row by row as shown in the chart, Fig. 3. Taper off the finishing end to a point and bind the last inch of coil to previous coil.

If the diameter has worked out at more than 8 in. or less, the design must be adapted to fit before introducing colours. A cardboard circle 8 in. across fitted now and again to the inside, as the basket is worked, helps to keep the sides to shape.

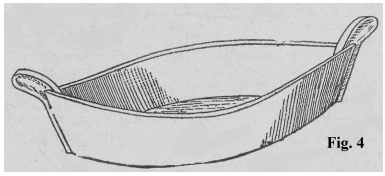


Fig. 4

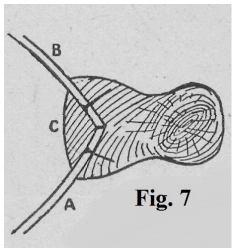


Fig. 7

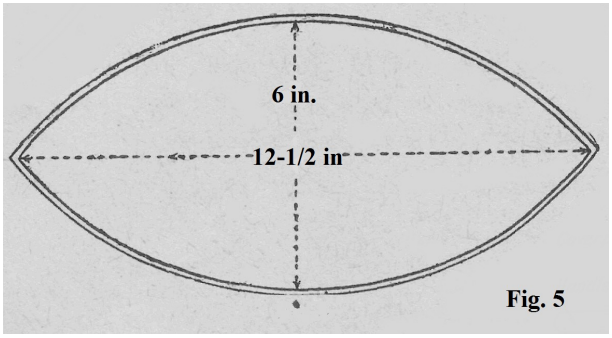


Fig. 5

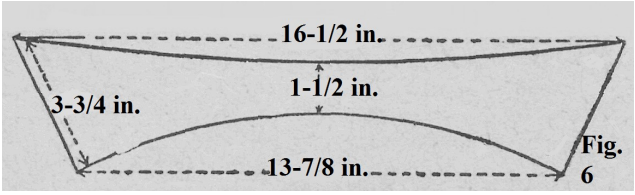


Fig. 6

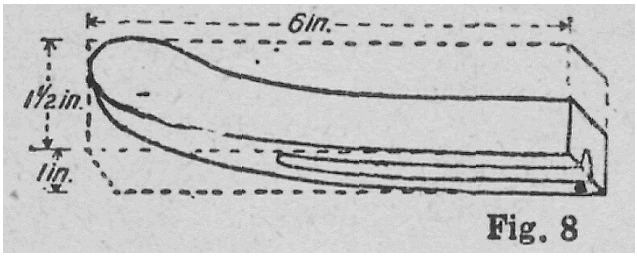


Fig. 8

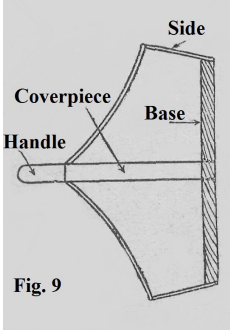


Fig. 9

Figs. 4-9. Basket or tray made in wood, in the form of a boat, with explanatory diagrams.

The amateur can also make the wooden bread basket or boat in Fig. 4, which exhibits Norwegian influence. It is made by cutting the bottom, Fig. 5, from ½ in. wood, such as mahogany or oak, and the edges are bevelled as indicated. The two sides, Fig. 6, are cut from similar material not more than 3/32 in. thick, bent to shape, glued and pinned to the base, the ends being held together temporarily by strings wound round them.

The two handles are sawn to shape from a piece of material 6 in. long, 1½ in. wide, and 1 in. thick, as in Fig. 8. The V-groove, Fig. 7, is cut out with a chisel to fit closely on the ends of the side pieces, A, B. The horns are carved, and when completed the handles are glued and pinned in place. A cover piece, C, Fig. 7, is cut to shape and glued in position in the apex of the triangular joint at the ends. The construction is clearly indicated in the section, Fig. 9. The work is completed by sand-papering and polishing, or by stencilling in liquid washable colours.

BREADCRUMBS: In Cookery.

Finer if rubbed through a wire sieve with the hand than if grated, fresh white crumbs are used for puddings, bread sauce, and often for crumbing fried foods, although dried crumbs will be found best for this purpose.

To prepare the latter put any fresh white crumbs that cannot be used in a baking-tin in a slow oven to dry, but not colour. Turn them over now and then, and when quite dry and crisp re-sieve them, and when cold store in a dry tin with a well-fitting 1id. These will keep for years, as long as they are dry, and are used chiefly for coating foods brushed with beaten egg previous to frying.

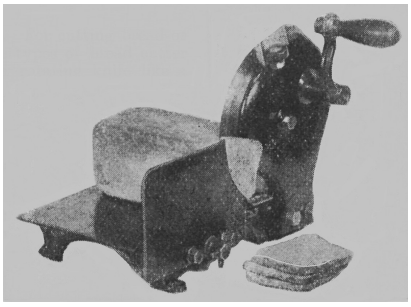
Dried browned crumbs are often called raspings, as some bakers sell them when they have rasped over the surface of the loaves. Put any crusts left from making white crumbs, or any small stale pieces of bread, on a tin in a moderately hot oven and bake until they are a golden brown. They must not be darker Then crush between paper with a flat iron or rolling pin or pass them through a breadcrumb crusher. The crumbs are passed through a wire sieve and stored in dry tins. Browned crumbs are needed for dusting over hams and bacon and for dishes served au gratin.

Fried breadcrumbs are served hot with roast game. Put about 3 tablespoonfuls of fresh white crumbs into a frying-pan with 1 oz. butter, and stir about until the crumbs are a golden brown. Add more butter if they seem too dry. Then drain on paper, add a light dust of salt and pepper, and serve separately on a hot plate.

BREAD CUTTER. For cutting bread or bread-and-butter three types of bread cutter are made. One has a rotating knife like a bacon cutter, another is fitted with guillotine or falling knife, and another with a cutter in a frame that is pushed backwards and forwards.

The first pattern is in extensive use, a typical model being illustrated. The cutter is adjustable to cut thick

or thin as required, and rotates in bearings in the frame. The bread is placed on the back of the plate or is pushed past the cutter. These machines seldom give trouble, and only require keeping perfectly clean and occasional sharpening.



Bread Cutter with loaf from which a thin slice is being cut.

BREAD FRITTERS. Use either ordinary household bread or French dinner rolls, cut into rounds. Cut 6 or 8 neatly shaped pieces of bread or rolls ¼ in. thick. Heat ½ pint of milk with the thinly pared rind of half a lemon till it is well flavoured. Dissolve in this a tea-spoonful of white sugar; take out the lemon rind, and pour into the milk a well-beaten egg. Pour this mixture on to the bread, and have ready a frying-pan containing 2 oz. of butter.

Directly the bread is soft, fry the pieces a golden brown on each side in the hot butter. Lift out of the pan, drain well, sprinkle with castor sugar and serve quickly with jam sauce (q.v.)

BREAD PAN. An old-fashioned but reliable bread pan is made of earthenware, with an earthenware cover. Such pans have the advantage of maintaining a more equable temperature than enamelled iron bread pans. Scrupulous cleanliness is essential together with periodical removal of breadcrumbs, and the placing of the vessel in a cool, dry place.

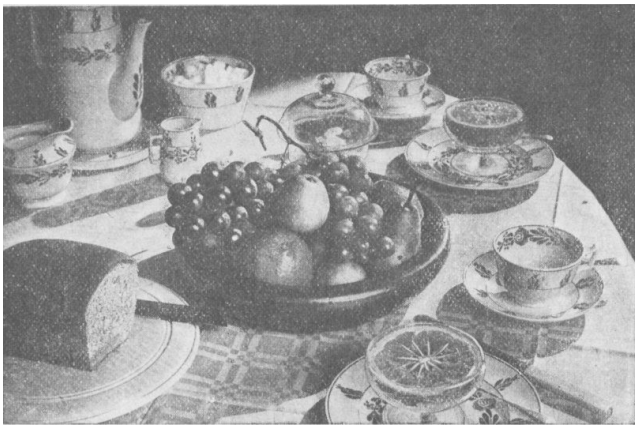
BREAD POULTICE. Cut up bread, stale if possible, into small pieces and put into a bowl which has been scalded. Pour boiling water over, cover bowl with a plate and put by the fire for a minute or two. It is then beaten up with a fork, excess of water being removed by wringing the mass rapidly in a towel, and the poultice is applied between layers of muslin. If a piece ot jaconet or oiled silk is applied so as to overlap the poultice all round by about ½ in., the heat will be retained longer. *See* Poultice.

BREAD PUDDING. To prepare this, soak ½ lb. stale bread in cold water until soft. Drain and press out water, put in a basin and mix with 3 oz. butter, marg., or chopped suet. Add 3 oz. flour, 3 oz. sugar, ¼ lb. currants or sultanas and a little chopped peel. Beat an egg, mix with a gill of milk, and stir these in with about ⅓ teaspoonful mixed ground spice or nutmeg. This pudding can be either steamed for l½ hours in a greased basin covered with buttered paper, and served hot, or baked in a greased pie-dish for about 1 hour in a moderate oven, and served either hot or cold.

BREAD SAUCE. To make bread sauce, which is served with chicken, etc., boil about ½ pint of milk with a small onion in which a few cloves have been stuck for flavouring. Add 2 oz. of soft breadcrumbs and cook gently for 15 min. It should be seasoned, a very little powdered nutmeg added if liked, then a piece of butter, and, if desired, a little cream.

BREAKAGE. It is illegal for a mistress to deduct anything from a servant's wages to pay for any crockery that the girl breaks when washing or dusting, unless she has expressly agreed with the girl that she will do so. If a maid breaks anything on purpose, or by gross negligence, the mistress could, no doubt, sue her in the county court for the damage done or dismiss her summarily; but beyond that she cannot go. The law regards accidental breakages as one of those incidents of domestic service that may happen without anyone being specially to blame. *See* Servant.

BREAKFAST: How to Serve. The British habit of eating a good breakfast encourages the housewife to make the meal as attractive and varied as possible. Many people, men especially, are most conventional in the matter of bacon and eggs; though fried tomatoes, potatoes, parsnips, bananas and mushrooms can all be served in turn with the bacon for a change.



Breakfast. A wholesome breakfast of fruit, brown bread and butter and coffee, the attractiveness of which is enhanced by the linen cloth and gaily patterned china.

It is convenient to provide a hot dish and a cold one, where there are several in a family. For instance, with hot fish, cold bacon or a galantine may be on the sideboard; with eggs, soused herrings, brawn or sardines. As a hot dish, uncurled whitings cooked in a fireproof dish with butter and parsley are often liked for a change, or dabs fried whole with a grilled tomato placed on top. Dried haddock is apt to be woolly unless a thick one is chosen, and well basted with milk and a lump of butter before serving; kippers are good cooked in a tin in boiling dripping and then toasted for a minute or two to crisp them. These dishes, when

served, may be on a heater on the sideboard, or sent to table in attractive oven-ware.

Eggs can be cooked in many ways, but a simple plan is to put some butter into a flat fireproof dish and, when melted, break the eggs into the dish and replace in the oven for a few minutes till set, sprinkling with a little chopped parsley to serve.

Value of Cereal Foods. Porridge is a valuable adjunct to the family breakfast. Many children take a dislike to this, and the reasons are usually because it is not stirred enough, and is therefore lumpy; because it is not cooked enough, or because the salt, which flavours the oatmeal, is forgotten. A change from porridge is a saucerful of one of the ready-cooked cereal foods which, served with hot or cold milk with stewed fruit or a little cream, is most nourishing. Fruit should always find a place on the breakfast table. Some people eat only toast and butter with grape-fruit or an orange, while the habit of finishing up breakfast with an apple is an excellent one for children.

Stands must be placed under hot tea or coffee pots if there is no tray or if this is of wood. For coffee a good mixture is equal quantities of Mocha and Plantation, with a very small amount of French chicory. If impossible to roast and grind the beans at home, only a small quantity of coffee should be bought at one time. A change for children is a big jug of cocoa made with milk. Should there be any sour milk left over from the day before, it does not take long to make a few soda scones, or ordinary rolls may be popped into the oven for a few moments.

A well-laid table is a great appetiser. A cheerful scheme is fruit in some quaint pottery bowl, or one of polished wood, on a coloured damask tablecloth, with jam, etc., in attractive dishes. While preserving harmony with the decorations of the room, breakfast china and table linen may introduce more colour and be more informal than those in use at other meals. Thus cottage china may be seen with check cloths, or orange pottery with unbleached linen appliqué with fruit and flowers. As a general rule the patterned service looks best with plain coloured linen edged perhaps with a border to tone.

What is known as a breakfast, service in a shop is a somewhat incomplete affair, unless several silver or other ware articles are to supplement it. It is sold for 6 or 12 persons, and usually only consists of that number of cups, saucers, and plates, a milk jug, a sugar basin, and a teapot. Breakfast dishes, toast rack, egg cups, larger plates, coffee pot, hot milk jug, cream jug, slop basin, jam and butter dishes are not included.

For those who prefer everything to match, or who do not wish to have silver articles used daily on account of the cleaning that they involve, there are a good many stock patterns, in which it is possible to buy each piece as required, including the extra articles named, together with porridge or stewed fruit plates, and grape-fruit holders. A stock pattern has the further advantage that any breakage can be replaced.

In earthenware—or as it is often called, semi-porcelain—these stock patterns are reproduced in some of the old designs such as Chelsea, Worcester, Lowestoft, etc.; they are not expensive, and the jugs and dishes in plain old-fashioned shapes are attractive, especially if breakfast cloths and napkins are cross-stitched in colours and designs to correspond with patterns selected.

In pottery there is not so much variety, except in bright colouring, particularly suitable for country house use. In china there is a wide range of flower and conventional patterns. For the nursery amusing rhyme illustrations and animal designs in stock patterns can be obtained. These suggest delightful tablecloths to correspond. *See* Appliqué; Tablecloth.

BREAM. Wrap the cleaned fish in buttered paper, and bake in the oven for about ½ hour. A more elaborate way is to stuff the fish with forcemeat made of breadcrumbs, chopped suet, and anchovy paste or chopped oysters, with mace, salt and pepper as seasoning. Bind the forcemeat together with milk or beaten-up egg, and cook the stuffed fish in the oven for about 40 min., keeping it basted all the time with dripping. Bream may also be broiled. In cleaning do not remove the scales.

BREAST: In Cookery. This name is given to the joint of mutton, veal, or venison below the shoulder, and including the thin end of the ribs. A similar piece of beef is called the brisket (q.v.). A breast of mutton can be stuffed and boiled or roasted, and is bettter boned, or it is difficult to carve.

Skin and bone the breast, taking away some of the fat, then spread it about ½ in. thick with forcemeat, sage and onion, or some other stuffing, taking care that the stuffing does not come too near the edge of the meat. Roll up and tie with tape, then drop into just enough warm water to cover and simmer slowly. Skim off any scum, but keep the lid on the saucepan as much as possible. It should require 15-20 min. boiling to every lb. and 15 min. over. It is equally good served with hot carrots and turnips, or cold with salad.

To roast, bone, stuff, and roll in the same way, and put in a good oven. Baste well, and allow ½ hr. to the lb. Serve it with apple sauce. This dish is known as mock duck.

Breast of lamb can be cooked without boning. Trim and put in a stewpan with enough stock to cover. Add a bunch of herbs and an onion stuck with a few cloves, and let the whole simmer gently until the bones can easily be removed. Season the meat, brush over with egg and breadcrumbs, and hang in a broiler before a clear fire, turning it so as to brown both sides. The dish should be served hot with mint sauce.

To boil a breast of veal, cover with warm water, adding parsley and a few peppercorns. Allow 20 min. to the lb. and 20 min. over. Serve with onion or parsley sauce and boiled bacon. It can also be broiled similarly to breast of lamb, but just before serving squeeze the

juice of a lemon over it.

A breast of venison can be stewed, roasted, or broiled in a similar manner.

BREATHING AND BREATHING EXERCISES

How to Improve Health and Strength

This article is one of an important group that deal with the care of the body. See also Gymnastics; Physical Training, etc.

The process of breathing, or respiration, is one by which carbonic acid is removed from the blood, and oxygen is supplied. The carbonic acid, produced by combustion in the tissues, comes from all parts of the body, chiefly in the plasma, or blood-fluid. The oxygen combines with the haemoglobin in the red corpuscles, and is distributed to every part. Hence the necessity for maintaining the blood in a healthy condition, with abundance of red corpuscles. Breathing is controlled by the respiratory centre in the medulla oblongata, or bulb.

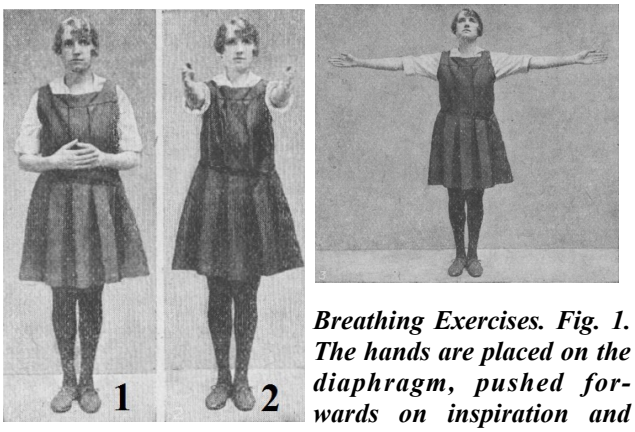
Inspiration is accomplished by increasing the size of the chest cavity, the diaphragm being drawn downward into the abdomen, the ribs being elevated, and the breastbone, especially at its lower end, being moved forward. For free and full inspiration it is necessary that neither the chest nor the abdomen shall be constricted by tight clothing. In ordinary expiration no muscular effort is made, the chest and lungs contracting by their own elasticity; but in forced expiration, as in coughing, sneezing, singing, etc., many muscles come into action.

The number of respirations of a healthy adult is about 14 to 18 per min., one respiration occurring to each 4 or 5 beats of the heart. During exercise and in feverish diseases, the rate of both breathing and the heart-beat is increased, and as a rule both go up and down together. In some morbid states the respirations are diminished.

The air changed in the lungs of a healthy adult at each respiration, which is called tidal air, is about 20 cu. in. By a forced inspiration 100 cu. in. more can be breathed into the lungs. This is called complemental air. After an ordinary expiration, a further 100 cu. in. of supplemental air can be expelled by means of the abdominal and chest muscles. But the lungs are never entirely emptied, and after this forced expiration, about 100 cu. in., which is called residual air, remain in the lungs.

During every 24 hours the immense quantity of 400,000 to 600,000 cu. in. of air passes into and out of the lungs in an adult person at rest. In hard work this quantity is greatly increased. Vital capacity is the quantity of air which a person breathes out by a forcible expiration after he has taken the deepest possible inspiration. This in an adult man averages 225 to 250 cu. in. Women average about three-fourths of the vital capacity of men. The vital capacity is usually measured by an instrument known as a spirometer.

Breathing Exercises. In such exercises the normal breathing movements are exaggerated, with the result that more oxygen is taken into the blood, more carbon dioxide expelled in the lungs and the circulation improved. These exercises are particularly beneficial to people who lead a sedentary life. In order that the air inspired may contain plenty of oxygen, practise breathing exercises in the open air, or by an open window. No restrictive clothing should be worn to hinder the expansion of the chest or abdomen. Stand in a natural, unconstrained attitude, with the shoulders erect. Practise the exercises between others; always breathe in through the nose and keep the mouth closed until the breath is exhaled. Do not repeat each exercise more than four times in succession.



Breathing Exercises. Fig. 1. The hands are placed on the diaphragm, pushed forwards on inspiration and drawn inwards on expiration. Fig. 2. Arms are held horizontally in front of body at the beginning of a deep inspiration. Fig. 3. They are then carried outwards and backwards, the abdominal wall is pushed out and the ribs raised.

(1) Stand with hands placed one over the other on the upper part of the abdominal wall. These should be pushed forward on inspiration and drawn inwards on expiration without moving trunk (Fig. 1).

(2) Same position, but with arms by side of body. Raise arms sideways above head, the abdominal wall is pushed outwards and the ribs are raised on inspiration. On expiration, the arms are lowered to starting position, the abdominal wall is drawn inwards and the ribs descend.

(3) Standing, the arms are held horizontally in front of body and parallel to each other. On inspiration they are carried horizontally outwards and backwards, and the head is extended, the abdominal wall pushed outwards and the ribs raised. On expiration the arms and head are brought back to the starting position, the ribs descend and the abdominal wall is drawn inwards (Figs. 2 and 3).

(4) The arms are held at a slight angle from the sides of the body, on inspiration the arms are turned outwards, head extended, ribs raised and abdominal wall pushed forward. On expiration, the arms, head and ribs return to starting position and the abdominal wall is contracted. *See* Chest.

BREATHLESSNESS. Shortness of breath on exertion may be due to a large number of causes, e.g.

obesity, anaemia, adenoids, emphysema, organic disease of the heart, disordered action of the heart, neurasthenia, Bright's disease, the abuse of tobacco, and tight lacing. See Anaemia; Heart; Lung, etc.

BREECHES. Whether designed for walking or riding, sports underwear for women, or period costume, the general style of breeches is a loose thigh, a close knee, and a tight fit below the knee. The looseness above the knee should be at the sides, and never at the inside of the legs, where the garment should be clean fitting.

Walking breeches are fastened below the knees by either buttons or laces, the latter being arranged to come on the front of the leg, while the former should be just off the shin-bone, on the outer side.

Riding breeches should be very loose on the outsides of the thighs, the knees should be tight, and below the knees skin tight. Extra inside leg length is needed, to provide the necessary "arch" for sitting the horse. The materials are of heavy weight and firm texture, such as woollen or Bedford cords. Velvet cords are sometimes employed. Knee strappings may be of the same material as the breeches, but are more often of buckskin. Either leggings or top boots are worn.

BREEZE BLOCK. Fine cinders, crushed coke, furnace clinker, and burnt brick are used under the name of breeze in the construction of blocks for house building. When made up in the form of concrete, breeze blocks are fire-resisting, light and porous, suited for partitions and other internal walling. The surface is rough and takes plaster readily, while wooden sheetings or battens can be nailed directly to the blocks.

As a floor covering breeze blocks are laid on a damp-proof course set direct on the concrete foundation. The blocks are set in mortar, and if laid to a fair level the floorboards can be nailed directly to them. The damp-proof course may be any bituminous sheeting, or good roofing felt if set in hot pitch.

Coke breeze blocks, which are often used for exterior wallings of bungalows and other dwellings, should be built in the form of a hollow wall, with a cavity between the inner and outer skins, cross-bonding being effected with galvanised iron wall ties, or by using some of the ready-made hollow bricks.

When a limited number of blocks are wanted they can be made up on the site, by casting in wooden moulds, which need not be anything more elaborate than shallow boxes of suitable size, generally about 24 in. long, 12 in. wide and 3 in. deep. The concrete is mixed in the proportions of 1 part of Portland cement to 5 parts of coke breeze, these being measured by bulk, as in a pail, and not by weight. Only sufficient water is added to make the mass hold together; complete mixing is essential. The blocks are set to break joint. *See* Cement; Concrete.

BRIBE. It is not an unknown thing for tradesmen to pay what they call commission to domestic servants. If the mistress knows about it, and permits it, well and good. But if she does not, the law regards every such payment as a bribe paid to the servant.

The servant may be summarily dismissed and is legally liable to disgorge everything received. An action will lie against the tradesman for damages.

Further, a criminal prosecution will lie against the tradesman and the servant. It makes no difference at all that the tradesman has only charged ordinary market prices.

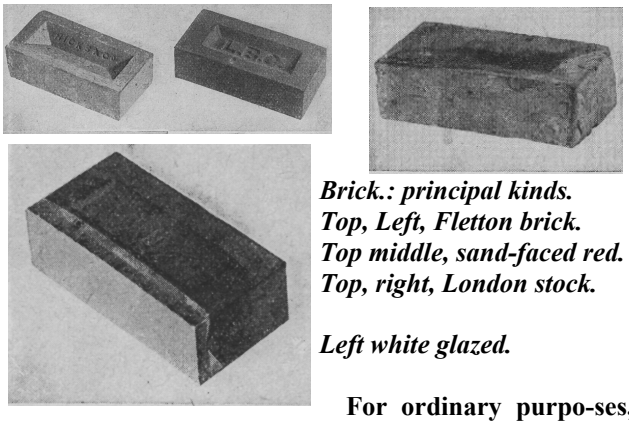
BRICKS AND BRICKLAYING

Materials and Processes Described and Illustrated

Related articles include Architecture; Building; Garage; Greenhouse; Mortar, etc. See also Drawing

Bricks are the staple material used in Great Britain for walls and general house building purposes. Good bricks are durable, but require careful selection for outside surfaces, both in regard to weather-resisting properties and artistic effect. They have a longer life and lower cost of maintenance than most other building materials; their fire-resisting qualities are good, and insurance rates for brick buildings are generally less than those for other forms of construction, timber especially. Brick buildings are easier to raise money upon, and they sell more readily.

Brickwork generally is measured by the rod of 272 ft. super, reduced to 1½ bricks in thickness. Sixteen bricks will make a wall one brick thick and 3 ft. long of 4 courses, or 1 ft. in height. A 9 in. wall would take just twice that number. When laid flat, 32 bricks will be needed to cover 1 sq. yd.; that is, an area of 9 sq. ft.; but, if laid on edge, 48 bricks would be required.



Brick.: principal kinds.
Top, Left, Fletton brick.
Top middle, sand-faced red.
Top, right, London stock.

Left white glazed.

For ordinary purpo-ses, bricks can be reckoned as measuring 9 in. long, 4½ in. wide, and 3 in. thick; they weigh on the average about 7 lb. each when dry. A brick will frequently absorb 7 to 8 oz. of water. For outside facings a good rule is to reject any brick that absorbs more water than 15 per cent, of its dry weight.

The kind of brick in most general use is known as the Fletton. It is hard and square but not of good colour, and is reputed not to last long in damp and exposed places. It is so lacking in porosity that plaster will not adhere to it, but has to hang on to the mortar joints in the brickwork. Flettons are a raw red in

colour, and are extensively employed in building walls which are faced with bricks of other kinds.

The London stock brick has quite a different character. It is soft, sandy, and porous, and able to hold plaster. From a hygienic point of view it is better suited to house building than the Fletton, because it will breathe, or allow air to pass through the walls.

The red, sand-faced, hand made facing-brick is the most highly esteemed wherever it is obtainable. It is made chiefly in the southern and eastern counties. In the north, west, and Midland the pressed red brick of even shape and smooth surface is used for facing. Staffordshire blue bricks are in demand for foundation work, or any purpose where the maximum resistance to damp is of importance.

Glazed bricks with a white or coloured surface are made of fireclay and glazed in the same way as pottery. They are used for halls and bathrooms and in courtyards for external facing where light is lacking.

On the top edges of garden walls and parapets or gables of houses coping bricks are used, specially shaped to throw off water and protect the brickwork under them. Splay bricks and others with mouldings on one edge or one end are used to form plinths, strings, cornices, or window-sills on the external faces of buildings.

Amateur Bricklaying. (For illustrations see page 266). Although brick-laying is a skilled trade, simple work is quite within the capacity of the amateur. For most work, a 9 in. wall suffices; in fact, for small erections, such as the lower part of a greenhouse, a 4½ in. wall will be quite serviceable. Nothing should be attempted above 8 ft. in height, because the matter of scaffolding for higher buildings involves operations in which experience is essential.

A brick wall must have a solid and level foundation to rest upon. After marking out the ground, a trench, must be dug, in which to pour the concrete for the foundation. Upon this foundation are laid the brick footings, consisting of two courses or rows of bricks. The foundation concrete should be wider than the lowest course of footings, and for a single storey building may be 2 ft. wide and not less than 6 in. thick. This allows for two courses of footings built with bricks, and as these should be buried below ground-level, the bed of the concrete must be not less than 1 ft. 3 in. deep. Before digging out the ground, stakes should be driven in to define the corners and angles of the trenches, both inside and outside, and, in addition, lines or cords should be stretched tightly between the stakes so as to act as guides.

The ground should be dug out correctly to these lines, and pegs should be driven in along the middle of the trenches so that the tops of the pegs are all at the correct level for the finished concrete bed, acting as a guide when filling. If the earth shows signs of falling in at the sides, keep it in place with rough boards set vertically on edge and secured with short stakes or pegs. Make the bottom of the trench hard and firm. Prepare a convenient part of the ground on which to mix the concrete, and then shovel it into the trench, ramming it down with a rammer, and taking care to test the surface to ensure that it is level both across the trench and lengthways. A spirit-level on a straight batten of wood, at least 6 ft. in length, is required in order to get the foundation concrete level. The pegs previously inserted should be accurately levelled by commencing from one corner and adjusting the other pegs accordingly until all are level. While the concrete is setting, the mortar—if lime is used—should be prepared.

First Stage in Building a Wall.

Next set lines along the sides of the work to lay the bottom course of footings by, 9 in. from the centre line of the wall to be built. Put the lines on the outside and work from the inside. Spread a bed of mortar 18 in. wide in such quantity that when pressed down it will make a joint about ½ in. thick. Then bed down the bricks in two rows of headers (Fig. 1). As the bedding proceeds the excess mortar that squeezes out at the sides should be picked up with the trowel and thrown on the bricks already bedded. Lay the first course thus all round the foundation and flush it up with mortar as the work proceeds, to fill the joints. This and the next course may be laid without putting any mortar on the bricks to form vertical joints.

Proceed similarly with the next course of footings, joining as shown in Fig. 2. The course will be 13½ in. wide, 6 ¾ in. each side of the centre of the wall. Flush up with mortar as before; that is, fill all joints with mortar.

On these two footing courses, which require only ordinary care in laying, begins the brickwork proper. Stretch two lines at right angles as before, 4½ in. outside the centre lines of the walls, and work now on the outside. The first operation is to build up 4 courses of bricks at the intersection of the two lines, to form the angle, and a similar quantity at the other end of the piece of wall to be now built. Fig. 3 shows the first course in plan, and Figs. 4 and 5 show the angle in elevation. These corner or end pieces must be plumbed up on both faces with the plumb rule in order to ensure the wall being upright.

This done, the line is stretched from corner to corner at the level of the top edge of the first course, forming a true line to work to when laying this course. The course being finished, the line is removed to a similar position on the second course, and so on till four courses are built (Fig. 6). The operations are then repeated for another four courses. First the corners are taken up, filled and plumbed, then the work filled in course by course between.

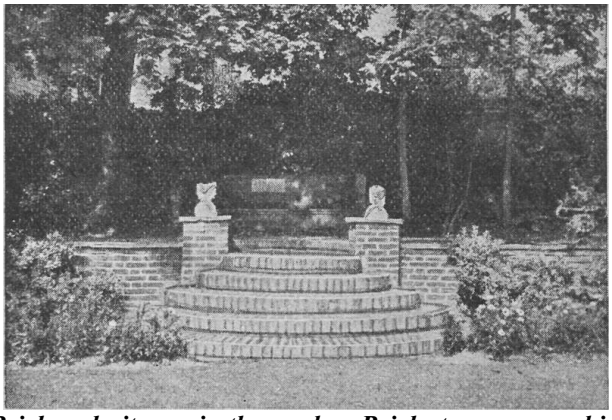
Brickwork in the Garden. (For illustrations see page 264). Apart from wall use, bricks are effective in place of paving for small gardens and courts, cottage approach paths, and steps; also for edging lily ponds, for floors in summer-houses, piers for pergolas and path-designing in sunk rose gardens.

In formal town gardens the rich warmth of red

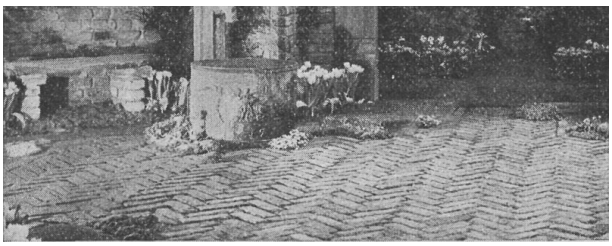
bricks economises labour, as it intensifies the colour value of flowers arranged in small, neat bedding sections, or in stone vases, and does away with gravel or grass. The contrast of stone or metal ornaments adds to beauty all the year round, and evergreen shrubs seem brighter against brick-work.

For pergola piers, antique facing-bricks or thin rustics may be used either in yellowish or reddish purple colours. A grey or fawn mortar joint should be chosen, as white spoils the effect. As the piers are small they should be built in cement and sand and with cross joints. For paths and practical steps, harder paving bricks can be obtained; while for small surfaces, 6 in. fireplace bricks may look more suitable instead of those of the standard 9 in. length. When making dry walls, or wide steps for a rock garden to be partially covered with outcropping plants, ordinary bricks can be used. Overburnt (burr wall) bricks may be chosen to add to the pleasing irregularity of the colour scheme and diminish cost of material by more than half for retaining walls where mortar joints are used. The surface for paths should be even and laid on an ash foundation, which admits of quick drainage after rain. The bricks may be laid flat and lengthwise as in stretcher courses of masonry.

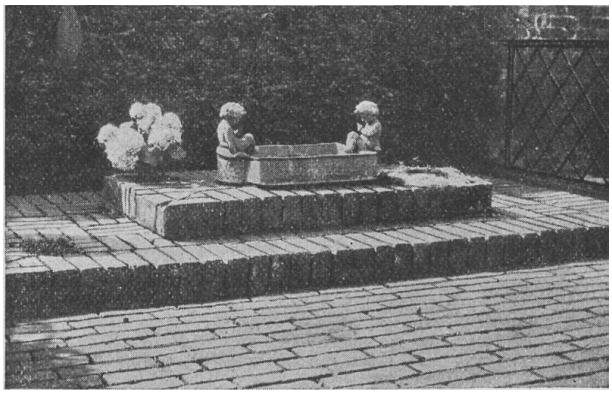
Round a sundial, or other central ornament, bricks may be laid without mortar, so that moss or little rock plants can grow through the crevices. A wide terrace or kitchen garden path may have the middle of paving bricks or stones and the sides of bricks laid without mortar. This treatment is suitable for the latter path when flowers are grown on either side and it continues a decorative effect from the house or flower garden to an alcove or ornamental corner where brick-work is again employed.



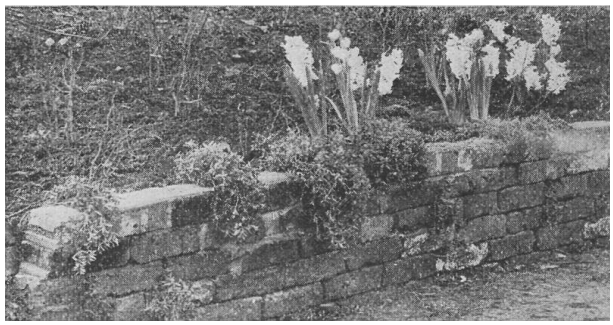
Brickwork: its use in the garden. Brick steps arranged in expanding semicircles lead to a brick-built seat.



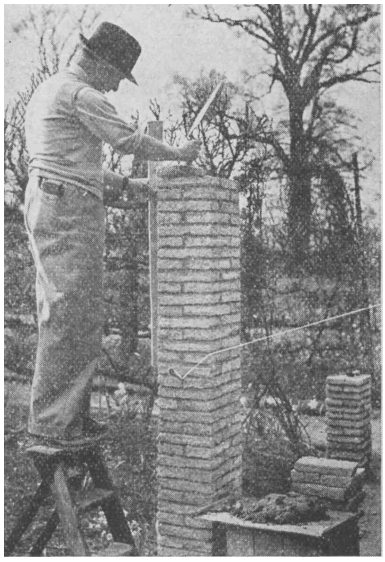
How bricks may be used for paths and other purposes.



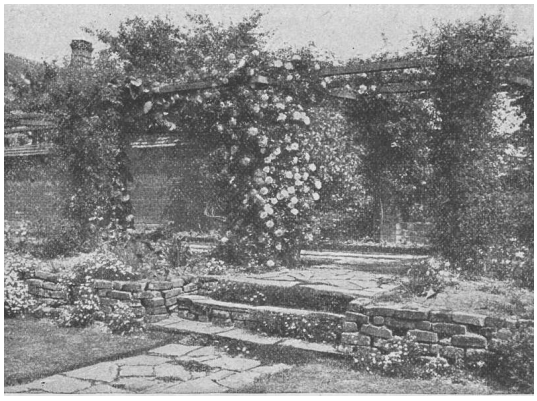
Small brick courtyard laid at three different levels.



Close-up of simple low dry wall, with its outcroppings of rock plants



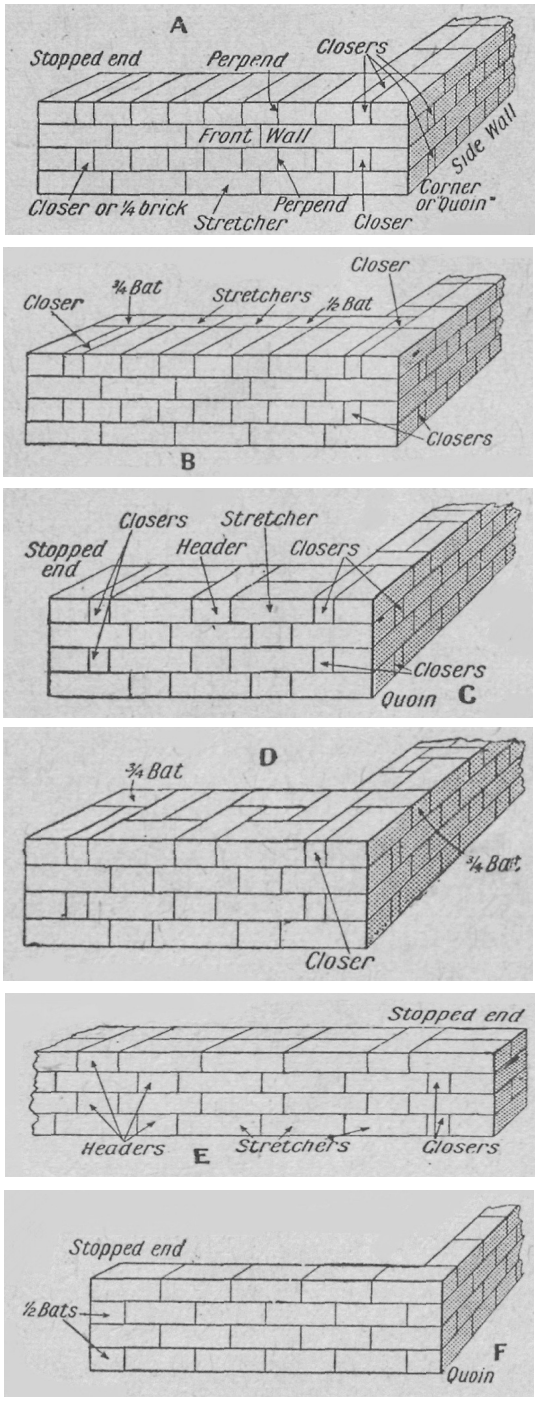
How to build pergola piers of thin rustic bricks; careful plumbing course by course is important to ensure a truly vertical pier.



General effect in a garden: both the dry wall and the piers of the pergolas are made of brick. Notice how the brickwork is combined with paving stones on steps and path.

Before beginning to lay out any scheme, a plan should be carefully drawn to scale of the proposed brick-work. *See* Garden.

The bond illustrated is English bond, the easiest to build and the strongest when built. (Diagrams showing the chief types of bond are given below.) Observe carefully the arrangement of bricks in the illustrations, noting the positions of headers and closers. The vertical joints, called in the trade perpends, must be correctly, that is vertically, over one another the whole height of the wall.



Brick. Fig. 8. Kinds of bond in general use. A and B. English bond. C and D. Flemish bond. E. garden wall bond. F. stretching bond.

The damp course in amateur work is best composed of a double course of slates or ordinary tarred roofing felt in long strips 9 in. wide, bedded in mortar and with mortar on it to receive and bed the course above it. The damp course should be at least 6 in. above the level of surrounding ground and below the lowest woodwork, the purpose being to prevent dampness rising from the ground, as slates are impervious to moisture.

The amateur can supplement the information given here and confirm it by watching a bricklayer at work. The mortar can be thrown on and the bricks set in place very quickly, striking them on the top with the handle of the trowel to level them. Special care must be taken before bedding each brick to apply a pat of mortar to the end or side to form the vertical joint, and also to flush up each course with mortar to fill up the whole of the internal joint.

The simplest way of finishing the external mortar joints between the bricks is by striking them as the work proceeds. This is done simply by cutting off the excess of mortar that squeezes out when the bricks are bedded, using the trowel as a knife placed flat on the face of the work, thus pressing the mortar with the trowel along the upper edge of the joint, until it is very slightly below the surface of the upper brick and flush with the face of the lower brick. For the inside surface of the wall a flush joint is better and is made by pressing the exuding wet mortar with the trowel, and making it flat or flush with the wall. The edges should be neatly trimmed off with a trowel, guided by a straight edge. A pointing trowel is best for amateur use on this work, being smaller and lighter than the ordinary bricklayer's trowel. When the mortar has set for an hour or so the wall can if necessary be washed down with clean water and a hard brush, to remove any surplus mortar from the face of the bricks and leave them clean and bright.

Vertical work next to a door-frame or a window must be jointed and bonded in the same way as shown for the corner of the wall. Figs. 6 and 7 show the bonding for left and right hand verticals respectively. Openings should be placed so that brick dimensions can be adhered to in the brickwork, i.e. a stretch of wall should be multiples either of 4½ in. or 9 in. in length. This avoids cutting of bricks. Joints should not be less than ⅜ in. in thickness.

Bricks have to be cut to act as closers and for other purposes. This is done as follows (Fig. 9): Mark a line on the brick where it has to be cut, then press a bricklayer's bolster or chisel on the line and strike it a light blow. Repeat the operation on other sides, then lay the brick on a smooth, firm surface and strike the bolster a firm, hard blow, thus cutting the brick. *See* Cement; Concrete.



Brick. Fig. 9. Bricklayer's bolster for cutting and shaping bricks.

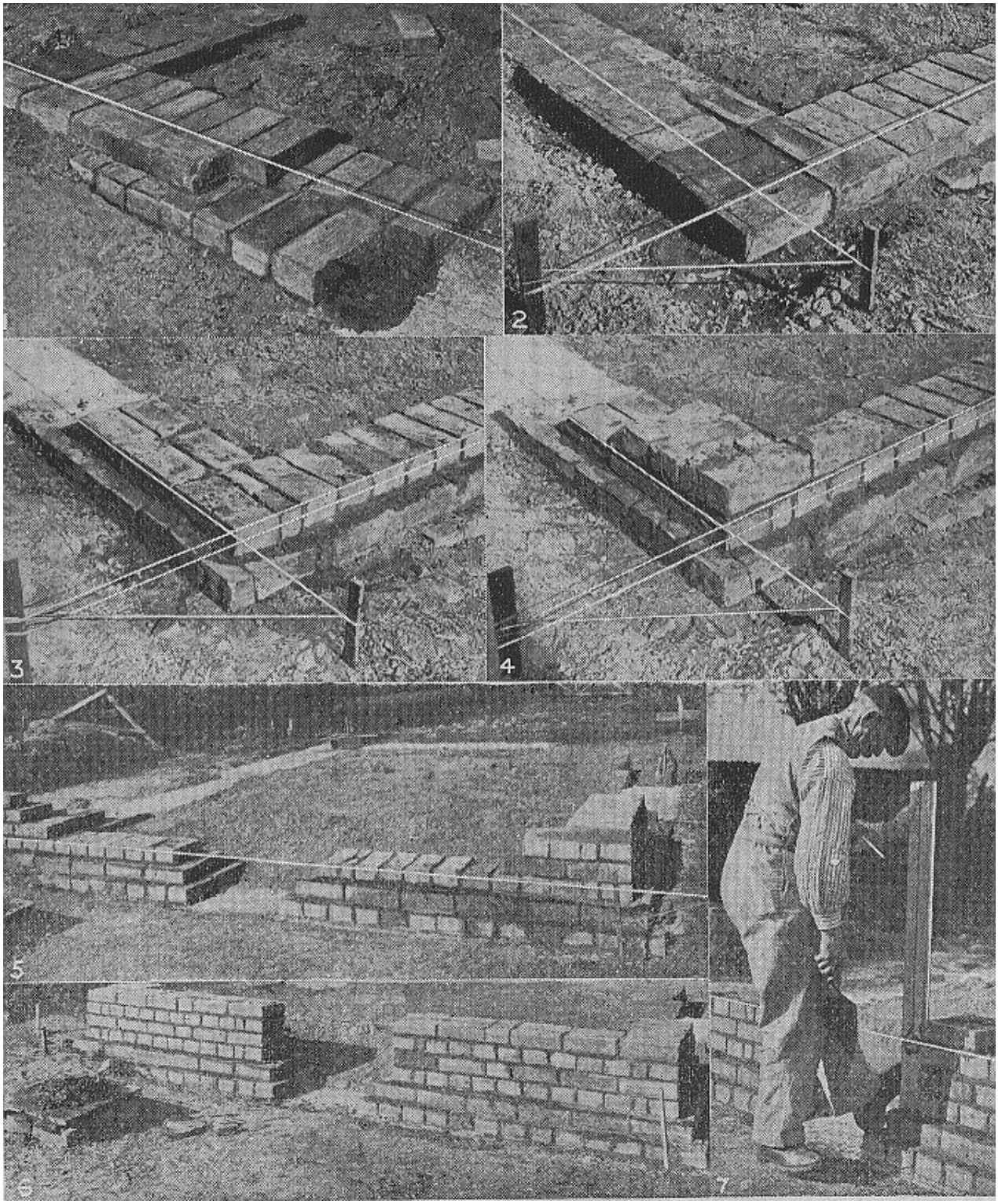


Fig. 1. Laying footings.
Fig. 2. First courses of footings, showing lapping of bricks.
Fig. 3. First course of wall, showing bonding and closers, and how headers in front wall become stretchers in side wall.
Fig. 4. Commencing second course of wall.
Fig. 5. Footings and quoins built up to four courses, showing bonding at stopped end for doorway.
Fig. 6. Wall four courses high.
Fig. 7. Testing brickwork with plumb-line.

BRIDE. It is usual for a bride to wear a white wedding dress, though a coloured one is occasionally chosen, and many brides are married in the clothes in which they are going away. A widow who re-marries does not wear white. It is said that the bridal dress should include:

Something old, and something new;
Something borrowed and something blue.

The veil may fulfil two of the requirements, for brides often borrow an old and beautiful lace veil. This can be arranged under a wreath of orange blossom, or of orange blossom and myrtle. Jewelry is not usually worn by the bride except the bridegroom's gift. No rings are worn on the occasion before the ceremony. If she carries a bouquet that also is his gift.

The bride walks up the church on the arm of her father, or whoever is to give her away, and at the chancel steps the bridegroom awaits her. She takes her place on his left, the veil over her face, and when the ceremony is ended she goes out to the vestry on his left arm. In the vestry she signs her maiden name, and comes down the church on her husband's right arm with her veil thrown back. *See* Marriage; Wedding.

BRIDEGROOM. With the assistance of his best man the bridegroom makes the arrangements for the wedding, as far as the church or place where it is held is concerned, and pays the expenses incurred there. He must be ready to receive the bride on arrival, and is responsible for the arrangements for leaving the church and departure for the honeymoon. *See* Best Man.

BRIDESMAID. For a very quiet wedding bridesmaids may be limited to two or dispensed with altogether; but if it is to be a Society function the number may vary from four to twelve. In this case the bride will see that the bridegroom's relatives are duly represented.

No tactful bride will allow her bridesmaids to wear colours that do not suit them or to be involved in expense beyond their means, and in planning the dresses she will bear this in mind. It is customary for the bridegroom to make a present to each bridesmaid, and if bouquets are carried he provides these too.

On the wedding day the bridesmaids arrive first at the church and await the coming of the bride. Upon her arrival they follow her up the church and stand behind her throughout the ceremony. The principal bridesmaid takes the bride's gloves, bouquet or prayer-book, and holds them until the service is over. The head bridesmaid follows bride and bridegroom into the vestry, and generally signs the register. Finally, the bridesmaids leave the church behind the newly wedded pair.

BRIDGE: CONTRACT AND AUCTION

The Modern Contract Game: Auction and Some Variants

The ancestor of both these games is whist. The first form of bridge differed from whist in its play by having a hand exposed on the table and by the introduction of no trumps. Other main differences are in:

1. Scoring—including penalties for breach of contract.
2. The manner in which the trump suit is decided.

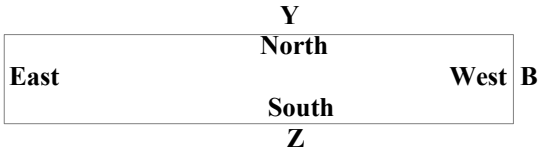
In the early days of auction the dealer had the right of naming the trump suit or to leave the decision to his partner. Auction bridge, as its name implies, extended this decision to all four players, and the value of the tricks in the different suits also underwent a change. The present game of auction bridge, formerly known as royal auction bridge, dates officially from 1914, in which year the English laws were revised.

Though contract bridge owns the same ancestor it is more correct to say that it is a direct offspring of Plafond, rather than of auction bridge. It came to this country in 1928 by way of France (where Plafond was played) from Amefica, though an Englishman claims to have introduced it as early as 1920. Though the old game of bridge is dead, auction bridge still survives in spite of the popularity of contract.

The following principles apply to both games:

The requisites are two packs of cards of different colours, and a score sheet for each player. The four players cut for partners, choice of seats, and for the deal. The drawers of the two highest cards are partners against the drawers of the two lowest cards, while the drawer of the highest card has the choice of seats and cards. In cutting, the ace ranks as the highest card in any suit, and cards of equal rank take precedence in the order spades, hearts, diamonds, clubs; e.g., the three of spades is a higher card than the three of any other suit.

Partners sit on opposite sides of the table. This is shown in the diagram below, A and B being partners against Y and Z:



These positions are sometimes designated as East and West, North and South.

Assuming that Y or North is the dealer, B shuffles the cards chosen and Y passes them to A to cut. This he does by taking off a portion from the top and placing it towards the dealer beside the bottom portion, which must contain at least four cards. Each player may shuffle once, and the dealer shuffles last. Z shuffles the other pack and places it on his right.

After the cards are dealt in the usual way each player looks at his cards and, starting with the dealer, calls in clockwise rotation. If any player wishes to pass he says "No bid." If, in the first round of the auction, the four players say "No bid," the hand is thrown in and the next player, B, deals with the other pack.

Otherwise the auction continues until the bid, double or redouble made by one player, has been passed by the other three.

Scoring. The object is to score sufficient points by tricks to make a game. The side which wins two games out of three wins the rubber, for which extra points are scored. Points are also scored for honours and penalties. (Ace, king, queen, jack and 10 in each suit are honours.)

The score sheet or scoring block is marked with a horizontal line and all points for honours, penalties and bonuses are scored above this line. Points for tricks are scored below the line and only these count towards the game. The final bid in the auction becomes the contract, and, if a suit is named, that suit becomes the trump suit, and the hand is played by the player on the contracting side who first made a bid in that suit; he is named the "declarer."

If the declarer fails to make his contract his side scores nothing for the tricks won by him and the opponents score, in respect of each under trick, so many points above the line. The opponents can never score below the line.

A trick consists of four cards, one from each player, and the highest card of the suit led takes the trick unless it is trumped. There are 13 tricks in a hand. Making seven tricks is equivalent to making one odd trick. A player who bids one, two or three diamonds (say) contracts to make 7, 8 or 9 tricks in all. If a player makes 6 odd tricks—i.e. 12 tricks in all—it is called a "little slam" and a "grand slam" if he makes all 13 tricks.

The first lead is made by the player sitting on the left of the declarer, and the partner of the declarer puts his cards face upwards on the table immediately the card is led and is known during the play of the hand as "dummy." The player who takes the trick leads to the next trick.

As regards the auction, each successive call, other than "no bid," must be higher than the last preceding one, but the values are different in auction and contract. A double does not alter the value of the call in the auction but affects the scoring of tricks and penalties. A player may not double his partner's bid. It is usual to designate spades and hearts as "major" suits, and diamonds and clubs as "minor" suits.

Features of Auction. The similar features of the two games having been dealt with, the differences must be examined. For the sake of clarity these are not contrasted side by side, but auction bridge is taken first.

Suits rank as follows: Clubs, Diamonds, Hearts, Spades, with respective trick values 6, 7, 8, 9 and, if there are no trumps, 10 points.

These points are doubled in the case of a doubled contract, or quadrupled in the case of a redoubled contract.

If the declarer fulfils a doubled contract his side scores a bonus of 50 points, and 50 points for each over trick. These points are doubled in the case of a redoubled contract.

If the declarer fails to fulfil his contract his side scores nothing for the tricks won by him, and the opponents score, in respect of each under-trick, 50 points, doubled in the case of a doubled contract and quadrupled in the case of a redoubled contract.

The bonus for a little slam is 50 points, and for a big or grand slam, 100 points.

A game consists of 30 points which, of course, can be made in one hand or by degrees in two or more hands. When one side scores a game a horizontal line is ruled underneath, so that any points scored by the opponents cannot count towards the next game.

The side which first scores two games wins the rubber and obtains a bonus of 250 points. The totals of both sides are then added, and settlement is made on the difference.

For scoring of honours see rule 33.

The value given above to each trump suit decides to a certain extent the course of the auction or the succession of legal bids.

The value of a bid is determined by the trick values obtaining to a bid of its denomination, e.g., Y declares 1 heart, B 1 spade, Z 2 clubs and Y can then bid 2 no trumps, value 20 points. Then Z, if he wishes to make an overcall in clubs, will have to call 4 clubs (24 points) not 3 (18 points). (Majority calling, whereby 3 clubs overcalled 2 no trumps, was played for a short time only.) Three clubs, however, will overcall 2 spades though both have an 18-point value.

Principles of Bidding and Play

The aim of a bid is to discover the best combination in which the hands can be played to the advantage of any one side. The old principles of auction bidding have entirely changed (except, perhaps, in the case of a\few die-hard camps) by the introduction of contract for, even if some auction players refuse to play contract, they have watched it and taken to themselves some of the principles of contract bidding.

It is impossible in a short space to deal thoroughly with the question of bidding and play in both auction and contract, but the main principles are given below under contract which auction players should read.

Many books, perhaps too many, have been written on the principles of play and bidding at both games but it is strongly urged that the best way for beginners to learn and players to improve is by watching four good players.

The latest laws of auction bridge were published in 1932, and they are styled International in that they were brought out by the Portland Club, the Whist Club of New York and the Commission Française du Bridge. Every player should read these laws.

Contract Bridge, the Modern Indoor Game

So popular has this game become that it is true to say that as Lawn Tennis has become *the* outdoor game of the nation, so Contract has become the indoor game. Leagues and other bodies have been formed and even

County associations. Matches are played internationally and many tournaments and congresses are held in this country. This is mainly due to the inherent qualities of the game which provides infinite possibilities in the exercise of skill both in bidding and in play, and which gives the opponents of the declarer so much more interest in defence against a contract, but it is also due in some measure to Mr. Ely Culbertson, who made it possible for thousands of people to become reasonably good players by introducing a system which gave them a logical and scientific method of hand valuation. Even Mr. Culbertson's fiercest critics will admit this. Whether he was the inventor or merely collated the opinions of others does not affect the question.

Where contract branches off from auction (the scoring is based on the same principles but the details differ) is that the contracting side cannot score more points towards game, i.e. below the line, than they have contracted to make. For instance, if Y Z contract to get 3 odd tricks in spades, and get 4 or 5 or a little or grand slam, they merely score the points attaching to 3 odd tricks below the line, the over tricks being scored above the line. Further, no slam bonus is given unless a slam is called. It will be seen how much more interest this gives to both the contractors and the defending side, for, since the former have usually called up to the limit of their strength, any mistake in the play of the declarer is punished and a good defence is at a premium.

A further difference is the vulnerability of a side. Either side which wins a game of a rubber is what is known as vulnerable, and the penalties for the non-fulfilment of a contract are tremendously increased. This adds piquancy to the game, for the non-vulnerable side can by overcalling, which entails only comparatively light penalties, push the vulnerable side into a contract which entails heavy penalties in the event of failure.

It often pays the non-vulnerable side to go down 4 or 5 tricks to prevent the other side from scoring a certain slam, and this will be apparent from the table of penalties.

Scoring in Contract. The trick values at contract are as follows:

When Clubs or Diamonds are trumps
20 points per odd trick
When Hearts or Spades are trumps
30 points per odd trick
When there are no trumps 40 points for first trick, and
30 for each subsequent trick.

In doubled contracts, odd trick points are doubled, and quadrupled in redoubled contracts. Vulnerability does not affect points for odd tricks. 100 points constitute a game.

Premium points for under tricks and over tricks and bonuses for honours and slams will be found in law 39.

Quick Tricks and Defensive Honour Tricks. Playing or Probable Tricks. The former have long been recognised, the others, with the introduction of contract. Quick tricks are any ace, any K Q of a suit. The standard table of defensive honour tricks (H.T.) is as follows:

2 Honour Tricks	A K of any suit.
1½ Honour Tricks	A Q K Q J of any suit.
1 Honour Trick	Ace, K Q, K J 10 of any suit, Kx & Qx of different suits.
½ Honour Trick	Kx, Q Jx of any suit in Qx & Qx of different suits,

and certain plus values like King alone or Qx.

N.B.—A king in your partner's suit counts 1 H.T. and a Queen ½ H.T.

It will be found that in all four hands of a deal there are from 8 to 8½ honour tricks. The number of honour tricks in a hand measures the defensive strength of a hand e.g., a hand with 2½ H.T. will make 2 or 3 tricks in defence, whereas the attacking strength of a hand is measured in probable or playing tricks as follows:

Count H.Ts. first—each worth one playing trick.
Trump suit: for every card more than three: 1 trick
Side suit: for every card more than three: ½ trick
To take an example of a hand:

S. A Q xxx. — H. K J xx — D. Q xx — C.A

Honour Tricks	3½	playing tricks
Long Trumps	2	playing tricks
Long Side Suits	½	playing trick
Total	6	playing tricks

Don't count any possible ruffing tricks—full value has been given for the long trumps. This valuation is based on normal or average distribution. The course of the bidding generally shows the distribution.

The valuation of a hand in a partner's suit is slightly different, for now ruffing tricks are counted.

Honour tricks: so many playing tricks
Long trumps ½ each
Long side suit ½ each
Ruffing tricks So many according to the following table

	With 4 or more trumps	With only 3 trumps
For doubleton	1 trick	½ trick
singleton	2 tricks	1 trick
void	3 tricks	2 tricks

Systems. The approach-forcing system (sometimes misnamed the Forcing-two) is perhaps the most played, and the honour trick table above and the bidding principles below belong to that system.

Bidding Principles. Remember that at contract each successive bid must name either a greater number of odd tricks than the last preceding bid or an equal number of a higher denomination.

The requirements for an opening bid of one of a suit are:

(1) at least 2½ honour tricks
(2) at least 4 playing tricks
(3) a biddable suit.

As regards (3), biddable suits are:
(a) a four-card suit headed by a Q J, or better
(b) a five-card suit headed by a K or R 10
(c) a six-card suit headed by a Knave, or better
(d) any seven-card suit.

The requirement for an opening bid of one no trump is now 3½—5 honour tricks with all suits nearly guarded.

It is impossible to go into details of bidding, but with the above valuations it will not be difficult to follow some general reflections.

Original bids of three of a major suit or four of a minor are strong bids showing strong and long trumps with at least 3½ honour tricks. Four of a major or five of a minor suit are pre-emptive bids on weak hands in defence but with 8 or 9 in the suit.

Responses to Partner's Opening Call of One of a Suit. If possible, keep the bidding open; call one no trump with even 1 H.T. Don't put him up in his suit unless you have at least Q and two others or four little ones. Even if you can put him up, call a biddable suit of your own before doing so provided you have 1½ to a honour tricks. He will continue the bidding because a positive, i.e. change of suit, is forcing for one round, and on the next round you can raise him in his suit. If, however, your hand is useless except in his suit, raise him even without any honour tricks, e.g., your partner goes one heart, raise him to four on: S.- H. Q xxxxx, D. Q Jxx, C. x x x. If you have a very strong hand make what is known as a forcing bid, i.e. go one more trick either in his suit or in your own suit than necessary to overcall, or go two no trumps if you have a level distribution with three suits guarded. If on the other hand you have a hand which is quite useless in his suit but very useful in your own suit make a double jump bid, i.e. one diamond; three hearts.

A forcing bid is so called because it compels you and your partner to continue calling until a game bid is reached.

To force in a suit you want from 3 to 3½ honour tricks. The opener can also force by opening with two of a suit. This means that he has practically a game in his own hand.

Response to bids of more than one of a suit follow naturally from meaning of original bids.

Doubling. A double can be either (1) informatory whereby you ask your partner to call his longest suit; (2) for penalties when you wish to penalise your opponents in their call. To differentiate between these two:

(a) A double of one or two of a suit or of one no trump is informatory provided your partner has not called. If he has called the double is for penalties.
(b) The doubles of all higher bids are for penalties.

Hints on Play. (1) *Play of the Declarer.* The Declarer can see 26 cards and after the first lead he should map out his plan of campaign. When there are trumps he must decide, according to the distribution in the two hands, whether to get out his opponent's trumps, or first utilise dummy's trumps by ruffing or whether it will pay to cross-ruff.

He should count up all certain tricks and see where others may be made, or, put in another way, how he can "eat his losers."

He must never try for overtricks, if, by so doing, he is endangering his contract.

In no trumps he must try to establish a long suit before his opponents do.

Play of Defending Side. Everyone should master the orthodox table of original leads which can be found in any books on Bridge. They are based on sound principles and common sense.

Generally against a no-trumps call:

1. Lead the highest of a sequence whether major or minor.
2. Lead the highest of touching honours when holding three honours.
3. Lead the fourth highest card when holding fewer than three honours.

With seven cards in a suit, headed by A K or K Q, lead A or K respectively.

Against a suit call (1) and (2) still hold, but the first part of three does not since one's object is to make tricks quickly. Therefore from K Q x x, lead King and from A x x x lead Ace.

If some other lead is possible do not lead from a tenace or from a king or a queen unless, in a no-trump declaration, you wish to establish a long suit.

(A tenace may be described as a sequence of three cards with the middle one missing, e.g., A Q or K J or Q 10. A Q 10 is a double tenace.)

The lead of the fourth highest is based on the eleven rule, which is as follows:

Subtract the number of pips on the card led from eleven and this gives you the number of cards higher than the one led in the other three hands. Since you see two hands you know how many the declarer has.

After dummy is exposed, his cards and the information your partner may be able to give you by suitable leads and discards will determine your subsequent play.

Endeavour to prevent a long suit in dummy becoming established, sometimes by holding up a high card and sometimes by taking out a card of entry.

If you want your partner to continue a suit, play a high card—a six or higher—and if you have the opportunity a lower one later. Further, if you have to

discard on any suit to which you cannot follow, throw a high one of the suit you want your partner to lead.

The international laws were revised in 1935.

Duplicate Bridge

Rubbers are not usually played in Duplicate Bridge. Each hand is a separate unit at a stated score but with no partial score. The first four hands are played at the following scores (1) love all, (2) Z Y game, (3) A B game, (4) game all. In each subsequent group of four the order is varied so as to give each player an original bid at each of the scores. This can be done in 16 hands or in 4 groups of 4 hands.

Duplicate boards can be obtained in sets of 16, on which the varying scores are marked, but these are not necessary. They contain pockets for the 4 hands of 13 cards each. A match is played generally between teams of 4. Two members of one team occupy the positions of A and B at one table and the other two those of Z and Y at the second table, which should preferably be in another room. The opposing team takes the other places.

Each hand is played at both tables. This is done by each player playing his cards in front of him (not into the centre of the table) and turning them over when a trick is completed. At the end of the hand all players collect their own cards and put them back in the boards or in envelopes provided for the purpose marked A, B, Y and Z, and the complete hand goes into the other room.

The play and scoring are exactly like Contract except that for a non-vulnerable game 300 points are added and for a vulnerable game 500 points. Auction scoring can be used, in which case the game points are respectively 125 points and 250 points.

Bridge for Three

Three-handed auction, otherwise known as cut-throat or skip, is played by three players, all against all. The simplest method is for the three players to sit on three sides of the table, leaving the fourth seat vacant, and to keep their seats throughout the rubber. The cards of dummy are then dealt to the vacant seat.

The final declarer of the highest bid plays dummy's and his own hand, and shifts dummy's cards to a convenient position facing him.

Variation in Scoring. Since there are no complete laws for this game, it is advisable to play it under auction laws with the following variation in scoring *if desired.*

Each player scores the trick value of the suit of each honour he holds up to three honours. (Four or five or four aces in one hand score the same as at auction.)

One hundred points are scored by each player for every game he wins, and the winner of the rubber adds a further 250 points to his score. At the conclusion of the rubber (if four games or two if both won by the same player) the total scores obtained by each player are added up separately, and each player wins from, or loses to, each other player the difference between his score and that of the said other player.

A variation of this game is also played. The dealer takes out the first or last 4 cards of the pack when cut and places them face downwards in the centre of the table. He then deals the remaining 48 cards in the usual way. The hand opposite the dealer is then turned up and becomes the dummy of the final declarer. The final declarer takes the 4 cards into his own hand and gives, from these 16 cards, one to dummy and one to each of his opponents, the last 2 face downwards.

This variation does away with the gambling for dummy while the distribution of the three cards calls for great skill.

Bridge for Two

There are four variations for two players: Double dummy, draw auction, draw bridge and blind auction.

Draw auction and blind auction have little in common with auction bridge, while draw bridge is an improved form of double dummy. Blind auction, however, is very useful for training card memory, and for this reason deserves a description.

Draw Bridge. This is played by the use of two card racks. These ingenious devices, obtained from most stores, enable each player to conceal his dummy's cards from his adversary. The players sit at adjoining sides of the table with the racks in front of them at a convenient angle. The cards are dealt into four hands. Before the bidding begins each player picks up the hand opposite to him and places the cards in his rack. Bidding, playing and scoring are as at auction.

The game is more interesting than ordinary double dummy, because, although each player knows his opponent's 26 cards, he does not know how they are distributed.

Blind Auction. Thirteen cards are dealt to each of the two players, the remaining half of the pack being placed face downwards. The dealer makes the first call, which his opponent can overcall or double, just as at auction. Neither player knows what the other has got, as there are 26 cards unaccounted for, and anything may happen. The strangest bids may succeed. But after this first hand has been played, the remaining 26 cards are dealt, 13 to each player. The dealer bids first, as before, and the bidding and scoring are as in auction.

A good player with a card memory will know every card that is in his opponent's hand from the cards that were played on the first round.

Contract scoring can be used in all these variations.

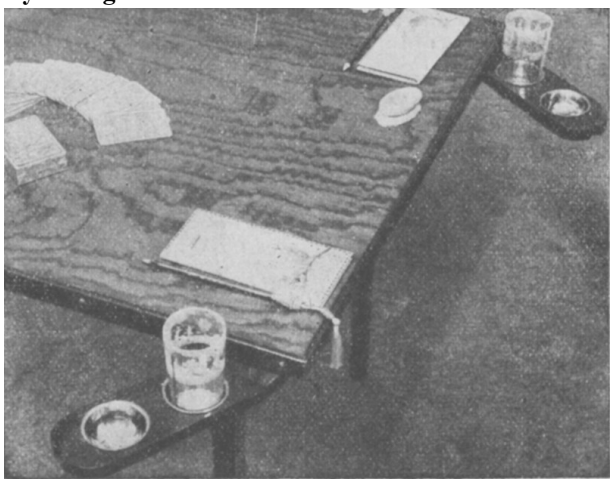
A variation of contract introduced from Vienna in 1938 is 5-suit contract. The pack is increased to 65 with a new suit called Royals. The odd card has the special power of a joker. Hazards and freak hands are greatly multiplied.

BRIDGE PARTY: How to Give. Many hostesses find that a bridge party given every two or three weeks is a means of discharging social obligations. The invitations may be by telephone or by informal letter.

For an afternoon party the hours are from 3 to 6.30. For the evening, from 8.30 to 11.30. If guests are asked a quarter of an hour before play begins, coffee—and liqueurs if liked---may be served, and there is less danger of play being held up by late arrivals.

The hostess should make up her tables so that the various players are suitably arranged; really good players together, and those whose play is of an inferior calibre placed at tables together also. If there are only two or three tables and all the players are equally matched, the hostess may ask her guests to arrange tables and partners by cutting before the game begins.

Folding card-tables can be bought so reasonably that the household may be equipped with one or two. The most useful tables, 30 in. by 30 in., accommodate ash trays, and some have racks for ash trays and glasses.



Bridge Party. Card table covered with black moiré and equipped with glass and ash tray racks. The scoring pads and ornamental pencils are pleasant.

Removable covers for green baize tops are easily made in furnishing velvet or moire, trimmed at the edge with tinsel galon, or the tables can be permanently covered with black moire, as shown in the one illustrated. Two clean packs of cards must be allowed for each table, and also four scoring pads and pencils.

There is usually an adjournment for tea or light refreshments during the afternoon or evening. At a small party such refreshments may be prepared on a side table. Otherwise they are served in the dining-room, and the guests at each table go at the conclusion of the rubber, after the hostess has in general invited them to do so. Any variety of sandwich, made with brown bread and butter, or white, or with bridge rolls, small cakes and fruit salad in glasses, may be served with suitable drinks either for the afternoon or evening party. *See* At Home; Sandwich.

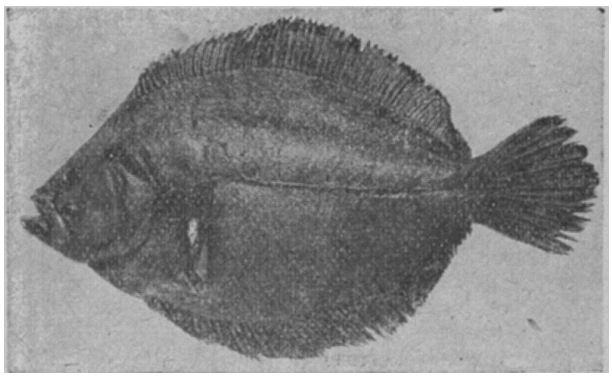
BRIGHT'S DISEASE. Nephritis or Bright's Disease is the name given to inflammation of the kidneys, which may be acute or chronic. The principal causes are exposure to cold and wet, especially after alcoholic excess, poisons of fevers, e.g. scarlatina or tonsillitis, or irritant poisons like carbolic acid, cantharides or turpentine. Acute nephritis may follow a large burn.

The acute form of the disease is always serious, because it causes accumulation of poisonous material in the system through the kidney being thrown out of action more or less. The chief signs may be headache and vomiting, or there may be drowsiness and convulsions, followed by unconsciousness. This condition is known as uraemia. Sudden dropsy of the lungs with great difficulty in breathing and a copious expectoration may occur at any time, and the doctor should be sent for at once.

During the attack milk should be the only food taken. A hot moist pack should be tried. He may remain in the pack from 15 to 20 min. Convulsions in children would be treated with a warm bath.

In chronic Bright's Disease two main varieties occur, the large white kidney and the small red kidney. Take regular easy outdoor exercise, avoiding over-fatigue. Keep to a simple, nourishing, largely vegetarian diet, be moderate with tea and coffee, and give up alcohol in every shape and form. The bowels and the skin must be kept active. Two or four grains of cascara at night, or a teaspoonful of Epsom salts before breakfast, may be taken. To keep the skin active, a daily bath at the temperature of 80° to 90° should be taken, followed by a brisk rub down with a rough towel. Plenty of plain water, mineral water, or weak lemonade should be drunk between meals to keep the kidneys well flushed out. *See* Kidney.

BRILL: Ways of Cooking. Steamed brill contains more flavour and nutriment than boiled. Wash, dry, and trim 1 lb. or more of cut brill. Rub over with a little lemon juice, and lay it in a steamer, covering it with a piece of greased paper. Heat the water under the steamer, and boil steadily for about 30 min., or until a knife can be easily slipped along between the bone and the flesh. Lift out carefully and place on a warmed fish-napkin, or fish-drainer, on a hot dish. Garnish with slices of lemon and serve with a tureen of fish sauce. One pound of brill is sufficient for 4 persons.



Brill, a table fish resembling the turbot.

Grilled brill is easily prepared. Fillet it, saving bones, etc., for fish-stock. Warm 1 oz. butter, and brush over the fillets and season them. Heat and grease the gridiron, lay on the fish, and grill for 10-12 min., or until slightly browned. Place on a hot dish, with a little

butter robbed over each piece, and a dust of pepper. Serve with parsley, anchovy, or lobster sauce. *See* Fish; Sauce.

BRINE BATH. By using the Droitwich or other salts in the proportion of 10 lb. to 30 gallons of water, brine baths can be prepared at home. They are useful in sciatica, lumbago, and chronic rheumatism. The bath should be maintained at blood temperature (98°). The patient should stay in it for 15 to 30 min., then be quickly dried and put to bed. *See* Bathing.

BRIOCHE: A Fancy Bread. For this yeast cake, put ¼ lb. flour on a board, making a well in the centre. In the well dissolve ½ oz. yeast in a little tepid water, and then enough water to mix the whole into a soft paste. Knead well, form into a ball and slash the sides with a knife. Leave in a warm place to set the sponge.

Now take ¾ lb. flour, and into a well in the centre put a level teaspoonful of salt and sugar and a teaspoonful of water. When dissolved add 4 oz. butter (melted) and 3 beaten eggs. Mix and knead well. The sponge should now have risen to three times its size. Spread it out on the paste and knead them together until full of air bubbles. Form into a cottage loaf, or into small twists and rings, brush with egg, and bake in a moderate oven on a baking sheet. Currants, candied fruits, etc., may be added if desired. *See* Bread.

BRIQUETTE. Coal dust, with a binding material such as clay, tar, resin or sawdust, made into briquettes or blocks of fuel. Coal-tar, pitch and ordinary coal tar are most generally used, but satisfactory briquettes have been made with clay. Resin is expensive as a binding agent and, like sawdust, is too inflammable. The blocks are made either by heating the pitch and coal dust together or by mixing the coal dust with tar without heat.

BRISKET: A Cut of Beef. For an appetising method of stewing brisket or breast of beef use this recipe: Rub vinegar and salt over 4 or 5 lb. fresh brisket and leave for 2 hours before dressing. Cover with stock in a small stewpan and skim well after bringing to the boi1. Simmer slowly for ¾ hour, and then add a carrot, half a turnip, 2 strips celery, 1½ onions, 8 peppercorns, a few sprigs parsley and thyme, and seasoning to taste. Continue cooking slowly for 2 hours.

When just done, heat 1 oz. butter in a saucepan, with 1 tablespoonful flour, and cook until the mixture becomes golden-brown in colour, stirring frequently. Take out meat and remove bones, then strain stock, and add sufficient water to make up ¾ pint. Pour this into pan containing the butter and flour, stir it until the mixture reaches boiling point, boil for 2 or 3 min., and season with salt and pepper. Serve as a sauce separately, but garnish the meat with the vegetables. *See* Beef.

BRITANNIA METAL. In the manufacture of tea and coffee pots, dish-covers, spoons, etc., Britannia metal is largely employed, being silvery white with a bluish tinge. It may be electro-plated with silver, but being, when of good quality, a hard alloy and capable of taking a high polish, it is often used in its own natural condition.

Britannia metal articles must not be left— to dry, for example—on the hob of a fireplace or anywhere exposed to flame or a very high temperature. If damaged they may be repaired by soldering.

As cleaning agents, liquid metal cleaners may be used, but there is nothing better than warm water with a little soda, or plain soap and water followed by a very soft brush a a wash-leather with the least touch of putty powder. *See* Electro-Plating.

BROACH. Long and slightly tapered, these tools are invaluable for rapidly enlarging holes in metal, hardwood, or fibre. Broaches, which are sometimes known as taper reamers, are made in numerous sizes, from a very fine one to ⅜ in. It frequently happens that on a job such as fitting a pair of hinges, the screws are just a shade too large for the hole. In such a case a few turns with a broach will enlarge the hole, and the job can be at once completed. These broaches are frequently fixed into wooden handles: but a better plan is to use an adjustable handled tool-holder.

BROAD BEAN. Of this bean plant the two chief types are the Longpod and the Windsor, and several varieties of each. The Longpod beans are now chiefly grown. Information on the cultivation of the broad bean is given in article bean (q.v.).

How to Cook. Broad beans are nutritious, but should be eaten with some fatty food, such as bacon or a butter sauce, to increase their food value. Salt should be added after cooking, as it tends to harden the beans if put into the water when boiling commences. Young broad beans, when taken out of their thick, woolly pods, can be cooked in boiling water to which a little sugar is added, until tender, probably 20 to 25 min. They are then drained and served in a hot dish with parsley sauce and boiled bacon, served separately.

For broad beans à la crême boil 1 pint of young broad beans until soft. Then remove the whitish skins, and put the green beans in a stewpan with 1 oz. butter, and dredge in 2 teaspoonfuls flour and 1 oz. grated cheese. Toss beans in this, and pour in ¼ pint cream and milk mixed, or only milk. Add a dust of sugar, some seasoning, and 2 teaspoonfuls chopped parsley. Stir gently until boiling, then heap them in a hot dish and garnish with sippets of toast.

To make broad bean soup put a quart of shelled beans and a sliced medium-sized onion into a saucepan of boiling water, and boil until soft. Drain off and save water for stock, unless it is blackish. Remove tough, outer skins, and rub green part of beans through a hair or wire sieve. The former will make the smoother soup,

but the latter requires less time and labour.

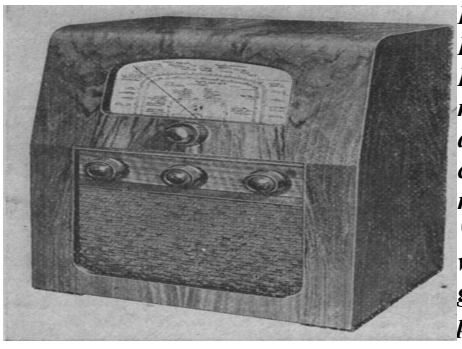
Melt 1 oz. butter in a saucepan; into this stir 1 oz. flour and ¾ pint milk and stock mixed. Boil and stir this mixture until it forms a sauce. Blend this with the beans, adding more milk or cream if necessary. It should be of the consistency of rich cream when finished. Season it with care, then strain it into a tureen, and serve it with croûtons.

BROADCAST RECEIVING SETS

Main Factors to Consider in Their Choice

Other information is given in such articles as Aerial; Condenser; Eliminator; Selectivity; Short Wave; Television; etc.

The modern radio receiver is a highly-developed piece of apparatus, and its design is the result of many years of steady improvement in circuit technique and manufacturing methods. The sprawled assembly of individual parts that characterised earlier sets has given way to a scientific system of unit chassis construction. It is largely for this reason that there are now no special problems attached to mass production of receivers. In fact, most of the processes concerned are entirely mechanical, and a model can be duplicated in any quantity with the certainty that there will be negligible variations in performance. The elements of chance that used to be present have been eliminated and any set should be as good as any other one of a specific design. At one time it was regarded as inevitable that a design should lose efficiency when subjected to repetition on a large scale, but the development of metal screening has been so successful and the progress in valve design and manufacture has been such that very high orders efficiency are achieved in compact, easily duplicated constructions. Other advantages of modern systems of quantity production are that purchasers receive good value for their money and that servicing is facilitated.



Broadcast Receiver. Example of a modern alternating current 4-valve mains set of the "all-wave" type which will give good results on practically all wavelengths from 18 metres to 2,000 metres (W.B.)

There have also been considerable improvements in the appearances of sets, for highly-paid artists are engaged by all the manufacturers to design attractive cabinets in distinctive, modern styles. In the more expensive models the cabinets may be of solid mahogany or walnut, but in most cases veneers are employed. The use of plastic materials such as bakelite has also become widespread and with them many beautiful effects and finishes are obtained; moreover, they are not easily affected by atmospheric or temperature variations.

Mains Sets. If the house is served by the electricity supply mains, a mains set which will derive the current for its operation from them can be used. The current consumed will be low and not likely to exceed that taken by one electric lamp of medium brilliance. It is necessary to know the nature of the supply before the set is ordered, for there are three types of mains sets. These are:

1 . A.C. Sets for working on Alternating Current mains only. They are generally designed for 200-250 volts, but special models for other voltages are readily obtainable. Similarly, it is only in unusual cases that the mains supply will have a periodicity different from those falling within the normal range of 40-60 cycles.

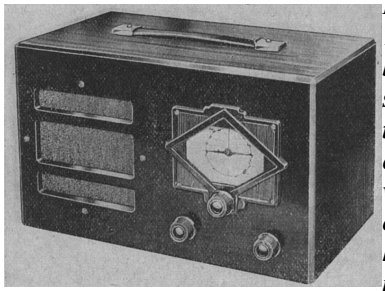
2. D.C. Sets for working on Direct Current Mains only. These are not so adaptable for the reason that it is not possible to vary the voltage of a D.C. supply by the expedient of interposing a simple transformer as is the case with A.C. The voltage can be stepped down by means of resistances, but it cannot be stepped up. Modern valves require voltages of the order of 120 upwards, so that if the D.C. supply has a pressure lower than that, then special steps must be taken if reasonably efficient results are to be obtained, such as, for example, the use of a "rotary transformer." This comprises a rotating device which is, in effect an electric motor and dynamo combined.

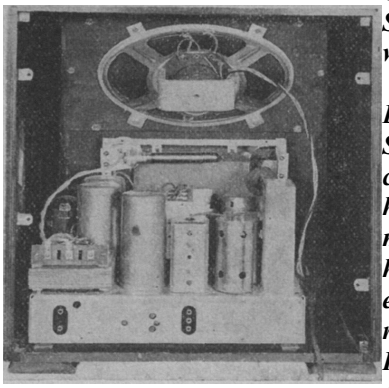
3. Universal Sets operate on either A.C. or D.C. mains, but when connected to D.C. mains they are subject to the same limitations as are D.C. sets in regard to the supply voltage.

"Transportable" is the term usually applied to a mains set which, by virture of its possessing a frame aerial needs no external aerial or earth connection. It can be carried from one room to another and connected to any convenient light or power point. As in the case of portable battery sets, it will probably be highly "directional". That is to say, it has to be turned round so that its frame aerial lies in line with the direction of the broadcasting station which it is desired to receive. Many transportables and portables are fitted with turntables in their bases so that they can easily be swung round.

Battery Sets. These are for use where there are no mains supplies. The batteries required are a small accumulator, which must be recharged every few weeks at a cost of from 3d. to 6d., and an H.T. dry battery which needs periodically to be replaced. In addition, many battery sets also use a grid-bias battery. This will be "dry" and demand replacing, but at longer intervals. With the aid of special valves such as "Class B's" and "low-consumption pentodes" it is possible to obtain splendid volume from a battery set with a

comparatively economical H.T. current; nevertheless, H.T. battery replacements remain a considerable item in the running expenses. Therefore, it is advisable to note the "H.T. consumption" of a particular set, and to ascertain what this will mean in terms of H.T. battery replacements. H.T. batteries are sold in "triple" or "super" capacities, and while these naturally cost more than the standard types, it may well be that their use would prove more economical.





Broadcast Receiver. The modern portable battery-operated set is so designed that, by the use of special low consumption multiple valves, it is both economi-cal and highly effective. This is a 3-valve W.B. Stentorian portable weighing 23 lb.

Broadcast Receiver. Scientific unit construction methods have resulted in economy combined with a high standard of efficiency and reliability. This H.M.V. receiver shows clean chassis design and the full use of a metal screening for all components, which gives unvarying performance.

A portable set is a receiver of a completely self-contained nature having accommodation for batteries and a built-in frame aerial. For this type of instrument an unspillable accumulator must be used. This can be of either the "jelly acid" or the "free acid" variety. The latter, which is designed on the principle of the unspillable ink-well, is in most cases to be preferred.

The most important factors to consider in choosing a set are as follows:

(a) The conditions of guarantee and the facilities for servicing the receiver in the event of a fault occurring in it.

(b) The cabinet work and standard of mechanical craftsmanship. The controls and switches should operate smoothly and without slip or undue "backlash."

(c) Quality of reproduction. Speech is a good test. The sibilants ought to come out clearly but without emphasis, and final "explosives" (t, d, p, etc.) be plainly audible. The piano should be heard naturally and without losing its distinctive timbre. Bass notes should sound full but clean and without "boom." Note the "background" for hum or crackling noises.

(d) Selectivity. The ability to separate one station from another is a prime essential in any radio set, and a high degree of selectivity is needed in order to combat modern ether conditions, especially if it is desired to listen to distant stations.

(e) Simplicity of operation. The actual number of controls is unimportant if they are accessibly placed and their purposes are understood and their handling simple. The dial should have the station names plainly marked and accurately placed.

(f) Wave-range. An "ordinary" broadcast receiver will receive medium and long-wave stations only, but an "all-wave" set embraces the short-waves as well. Short-wave reception is possible over great distances with even small "all-wave" sets, but it is liable to great variations. With no set, however powerful, can there be a guarantee of consistently reliable reception from, for example, any one particular American short-wave station. An 'all-wave' set does not necessarily enable the sound programme of the television station to be received, though there are special models which will embrace the television wavelengths.

(NOTE.—A specially geared tuning control is essential if the short-wave stations are to be quickly and easily located.)

(g) Refinements. A tone control is not so important as a volume control, but is very useful to use in conjunction with it, should the volume control not be of the type which automatically corrects the tone at different volume levels. Automatic volume control is to be found in many sets in addition to a manual volume control. Its function is to offset the fading which tends to occur when receiving distant stations after dark. Visual tuning indicators enable stations accurately to be tuned-in by the eyes, which are much keener organs than the ears. (Accurate tuning is particularly necessary with a super-heterodyne type of receiver if distortion is to be avoided.)

BROCADE. Brocades are always figured and usually in floral patterns, and generally the pattern is woven. According to one classification brocades have their groundwork formed by the warp or lengthwise threads, and their ornamentation by the weft or cross-wise threads. The name implies a rich decorative fabric, usually carried out in silk, artificial silk, or mixtures of silk and cotton, with or without metallic threads.

BROCCOLI: To Grow. For practical purposes broccoli may be called the winter type of cauliflower. Sowing is done as with curly kale, and the gardener who requires broccoli from October to May should make three sowings at regular intervals during April and May. Broccoli should not be planted between potatoes. To guard against injury from quick thawing after frost, the plants should be bent over until the stems are almost parallel with the ground, inclining the heads to the north if the rows run east and west, and west if they run north and south.

Some varieties are suited for autumn, some for spring, as follows:

Autumn: Michaelmas White, Self-protecting,

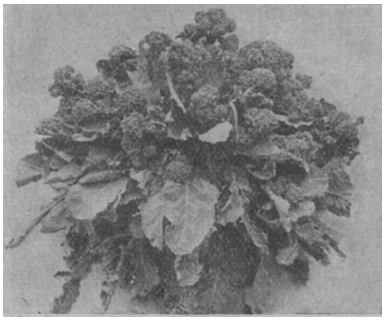
Autumn Protecting, Walcheren.

Early Winter: Christmas White, Snow's Winter White, Early Purple Sprouting.

Late Winter and Early Spring: Knight's Protecting, Penzance, White Sprouting, Leamington, Late Purple Sprouting.

Late Spring and Early Summer: Model, Late Queen, Methven's June, Latest of All.

The following standard sorts would give a good succession if sown together early in April: Walcheren, Snow's Winter White, Leamington and Latest of All, always provided the winter was fairly open.



Broccoli: two varieties of this winter vegetable. Right, Purple Sprouting sown in winter or early spring. Below. Late Queen, sown in spring or early summer.



How to Cook. Strip off the outer and all withered leaves, cutting the remainder level with the flower. Soak well in cold salted water with heads downwards to draw out any insects. Then cook for 10-15 min. in boiling salted water, the flower part downwards and the pan uncovered to preserve the colour. Test by piercing with a skewer, and when tender drain well, put on a hot dish and serve with a tureen of melted butter. Broccoli breaks if boiled too fast. The colour and crispness of this vegetable will be speedily lost unless it is at once taken out of the water when cooked.

With cheese sauce boiled broccoli makes an excellent dressed vegetable. Lay the cooked heads neatly on a buttered au gratin dish and coat with cheese sauce. Dust the surface over with two tablespoonfuls of grated cheese, mixed with a small tablespoonful of browned crumbs. Put dish in the oven and bake quickly until the cheese is browned and serve at once. *See* Cabbage; Cauliflower; Curly Kale.

BROGUE. This heavy-soled shoe has a tongue which folds over the instep to prevent water entering the eyelet holes. Brogues are used when heavier sporting boots are unnecessary. Imitations of the real article are sold, with punched toe-caps and vamp, and sometimes with the fringed tongue.

Broiling. *See* Grilling.

BROMIDE PAPER. Bromide papers of different surfaces, glossy, matt, and of different tints, white, cream, etc., are almost exclusively used for making the so-called gaslight prints and enlargements from photographic negatives. Newer forms include the chloro-bromide papers with a wide range of tones from brown to warm black.

The paper is so sensitive to light that an exposure of a second or two behind a negative placed a few feet from an electric lamp or gas mantle is sufficient to print a picture on it. It is too rapid to be printed by daylight. After exposure, a picture quickly appears in a developer, which, in two or three minutes, produces a print of black colour. All operations up to and including fixing must be done by orange or yellow light.

One or two small pieces of the paper are exposed for different times, and developed in order to find the correct time for which to expose the paper. If the picture comes up slowly and remains pale, the paper has been exposed for too short a time; if it comes up quickly and soon becomes dark and foggy, the exposure has been too long. The paper should be exposed so that a bright and vigorous print is obtained with about 2 min. development. Practically every bromide paper yields first-rate results with amidol, metol, or metolhydroquinone developer.

The exposed sheet ot paper is placed, coated side up and without previous wetting, in a dish and flooded with enough developer to cover it; or a number of pieces may be quickly slipped at intervals into a larger quantity of developer. When fully developed, as shown by its vigour and depth, each is rinsed in clean water for a few seconds and fixed in a bath made by dissolving 4 oz. of hypo and ½ oz. potass, metabisulphite in 20 oz. of water.

Chemicals for this fixing bath may be bought as acid fixing salts. Each print is best fully immersed under the surface of the bath for a second or two; and as prints accumulate in the bath they must be moved about so as to separate them from one another and ensure their being fully fixed. This is best done with a rounded stick, so as to avoid contaminating the fingers with hypo, which must on no account be allowed to get into the developer. Prints will be fixed in 10 or 15 min. They are then washed for an hour in running water, or in successive lots of clean water which is renewed every 5 min. Dry by hanging up on a line with clips or by laying out on blotting paper. Bromide prints may be changed from black (q.v.) to brown or sepia, or to red, blue or green. Of these toning processes (q.v.) that most largely used is sepia toning. Chloro-bromide papers give warm blacks and browns by development control.

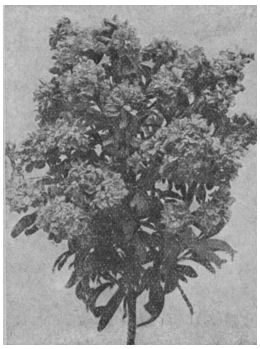
BROMIDES. There are several drugs of great use in medicine which owe their virtues to the possession of the chemical element called bromine. They are potassium bromide, sodium bromide, ammonium bromide, and hydrobromic acid. All these preparations have practically the same action and are used for

sleeplessness, nervous excitability, palpitation, etc., but when the drug has to be taken over a long period sodium bromide is preferred to potassium bromide.

The bromides are given in whooping-cough, ammonium bromide being considered the best for the purpose. Diluted hydrobromic acid is often taken with quinine. It helps to dissolve it and also to prevent the disagreeable effects sometimes produced by quinine. Giddiness may be alleviated by one of the bromides, and if full doses are taken every 3 hours for several days before going on board ship, seasickness may be prevented or diminished. Sleeplessness due to worry and nervous excitement may be relieved by 30 grains of potassium bromide in half a glass of soda water. Another use is in irritable conditions of the pharynx and larynx. In epilepsy bromides are given over long periods.

Bromism is the condition produced by over dosage with bromides over a period and characterised by mental dullness, heaviness of the legs, unsteady gait, drowsiness, anaemia, an acne eruption and other symptoms. The addition of a little arsenic to the mixture usually prevents any eruption when bromides are being taken.

BROMPTON STOCK. This is the popular name of a variety of the genus Mathiola, a half-hardy, biennial flowering plant. The seed is sown in May. In cold districts it is wise to winter the plants in a frame and put them out in spring. The plants average about 18 in. in height, and the flowers are sweetly perfumed.



Brompton Stock. Flowers and foliage of the double red variety, useful for beds and borders.

BRONCHITIS: Care and Cure. While rarely dangerous to healthy adults, bronchitis is serious for infants or old people, in consequence of its tendency to spread to the lungs. It may be defined as catarrhal inflammation of the mucous membrane which lines the bronchial tubes or air passages of the lungs.

Acute bronchitis is most common in spring and autumn; it may develop from an ordinary cold in the head or be part of some ailment, such as measles, influenza, or whooping-cough, and is due to the invasion of the air passages by germs. The attack begins with symptoms of a cold in the head, including perhaps sore throat. There may be little or no fever. The extension of the catarrh downwards produces hoarseness and a raw feeling in the chest, behind the breastbone. The tubes feel irritable, and there is a hard barking cough which may become paroxysmal. The chest feels tight and oppressed. At first there is only a slight sticky sputum, but in about a week's time this becomes freer, and increases the patient's comfort.

In treating bronchitis the patient should be confined to his room, and it may be necessary to put him to bed. A hot bath or a hot mustard and water foot-bath and a mustard plaster applied to the chest are useful. The inhalation of steam from a jug of steaming water, to which a teaspoonful of Friar's balsam has been added, helps, to soothe the racking cough, the patient covering his head and the jug with a towel. If there is difficulty in getting up the sputum, ipecacuanha wine in 10 minim doses may be given three or four times a day in a little water.

When bronchitis descends into the lungs, affecting the tiny end branches of the bronchial tubes, the patient's restlessness and distress increase, the temperature becomes higher, he has much greater difficulty in breathing, and the cough is more marked. The lips and the finger-tips are often livid. The immediate attention of the physician is essential.

Emergency Treatment

In a child the condition may be ushered in by convulsions, and the child should be put in a warm bath. During the course of the illness the child may suddenly become very blue and breathless; there also the warm bath would be used and cold water thrown on the child's chest to induce deep breaths. These measures are, of course, only pending the arrival of the doctor.

After several attacks of acute bronchitis the lungs, particularly in middle-aged persons, may lapse into a chronic condition; but more often chronic bronchitis is associated with some other condition, such as heart disease, emphysema (barrel-shaped chest), diseased states of the lung induced by dusty occupations, gout or chronic kidney disease. Frequently the disease takes the form of a cough, which develops regularly at the start of each winter and lasts until the following summer.

Sufferers from chronic bronchitis should pay particular attention to keeping the bowels regular. Two to three grains of cascara taken at night are usually all that is required. For the morning cough a hot alkaline drink, such as the following, sometimes gives relief:

Sodium bicarbonate	2 drams
Potassium bicarbonate	1 dram
Chloroform water	4 ounces

Take one tablespoonful, mixed with two tablespoonfuls of very hot water, immediately on waking.

A thorough rubbing of the chest with ordinary soap liniment or hartshorn and oil, and then covering the chest with a warm jacket of flannel, is also advisable in chronic bronchitis. *See* Cough: Lungs.

BRONCHITIS KETTLE. Special kettles made to emit a great volume of steam, which moisture is useful in assisting the breathing in bronchitis and similar complaints, are made and sold for this purpose. In case one of these is not at hand, an ordinary kettle can be used. Filled with water, this should be placed on the fire and allowed to boil freely. With thin cardboard or brown paper, or, if these are absent,

with ordinary newspaper, a large trumpet-shaped roll should be made. Place the narrow end of this over the spout of the kettle and the wide end near the patient's bed, which, for this purpose, must be fairly near the fire. The roll can be supported by putting a piece of tape round it and fastening the other end of this to an overhanging projection of some kind. This improvised kettle will be found very useful in attacks of croup (q.v.).



Bronchitis Kettle with extended spout.

BRONZE. Genuine bronze is generally found in the home in the form of statuary and ornaments. It is an alloy, chiefly composed of copper and tin, and is harder and more durable than copper or brass. Bronze has a pleasing dark brown colour, and is capable of taking a high polish.

The so-called bronze powders are metallic colouring materials used in the same way as gilding preparations. The article to be treated is coated with gold size, after which the bronze powder is sprinkled evenly over the surface. Various tints are to be obtained, in addition to powders simulating gold, silver, aluminium, etc.

Bronze Collecting. When selected with taste, bronze figures or vessels are restful to the eye. A classical centrepiece, such as a good bronze replica of a full-length Mercury may be appropriately flanked by a pair of unglazed Parian figures; it would lose in effect if placed between pieces of highly decorated china.

Egyptian bronzes are often forgeries rather than replicas, except such things as sphinx paperweights, and have little decorative merit of their own. It is otherwise with the statuary bronzes of the Renaissance, or some admirable modern works. These are in some instances available in replica, and artistic reproductions have to be distinguished from inferior castings which are turned out abroad in great numbers for cheap decoration.

Replicas, of ancient Chinese and Japanese temple bowls, koros or incense-burners, lanterns, bells, and Buddhist images are desirable acquisitions. The modern school of Japanese bronzists has produced excellent work, including animal groups and figures, worthy to be set out with choice porcelain jars. Some Saracenic and Persian work, especially when damascened in silver, and certain bronze lamps and figures from Ceylon are also good.

The natural patina or crust of genuine old bronze is often imitated in replicas, and such finishes are not to be rejected if carried out sincerely. The intentional production of tints and sheens, either by oxidation or by liquid varnishes, reaches its highest level in eastern bronzes. Their effects are sometimes due to the admixture with the copper-tin base of silver and other metals, sometimes to the use of metallic pastes, which are burned in and polished. Imitation patina is produced by green varnishes, which are liable to flake, or by sal ammoniac.

Art-bronze is a term applied to much metal work of a trivial kind, and is especially affected by producers of tasteless ornaments, and thin stampings used as furniture panels. The collector of bronze ware for its antiquarian interest usually preserves his treasures in cabinets. They may include a great variety, from weapons of the Bronze Age to Anglo-Saxon buckles and brooches, and medieval bells cast before brass had displaced bronze.

Natural patina ought not to be scoured away. Inartistic stains may be removed, without destroying the patination, by means of a half-lemon dipped in salt. Sometimes antique bronze when unearthed is found to be oxidized throughout, and in that condition cannot be cleaned at all.

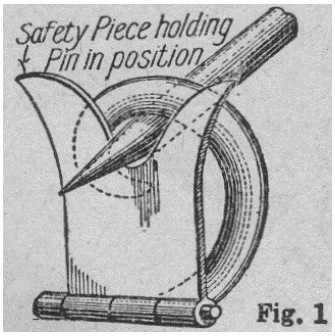
BRONZING. By the process of bronzing any article made of metal, wood, plaster, or other material is given a bronze-coloured surface. Iron and steel are bronzed by exposing them to the vapours of heated aqua regis, and dipping them into melted vaseline. Plaster and wood are coated with size, then a metallic bronze powder is applied.

Dilute sulphuric acid and dilute nitric acid produce a bronze colour on many metals. The most artistic effects are obtained by the use of bronzing acids on brass or copper ware. The acids are obtainable from any dealer in such substances.

The brass object is first cleaned and polished, either by mechanical means, as with emery powder, or by dipping in dilute nitric acid and washing off in hot water. The work is dried in hot sawdust, and must not be touched with the hands. Make a rubber of fine wood-wool shavings or linen, wearing rubber finger-stalls on the finger-tips to prevent the hands getting stained. Slightly warm the work, then wipe it over once only with the bronzing acid. Keep the work free from draughts, and move it about over, but not too near, a gas flame. A deeper colour can be obtained by using a stronger solution or by repeated and continued applications of the rubber, always taking care to work evenly.

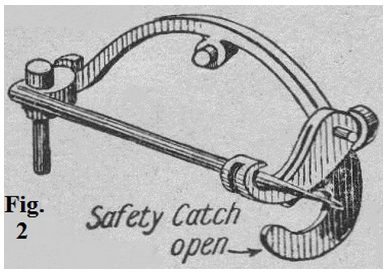
BROOCH. The simplest form is the safety pin; all other brooches are elaborations of the same idea. For a valuable brooch a good safety catch is the best form of insurance against loss.

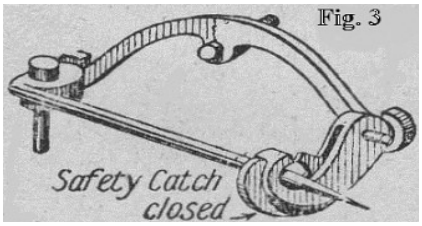
In the case of the brooch fitted with a hook or a point-protecting catch, a safety chain should be attached. There is little difficulty in attaching it to the brooch, provided there is a small aperture through which the jump ring can be passed and afterwards closed with a pair of pliers. Instead of a safety chain, an efficient catch known as a fish tail can be fitted by a jeweller without much trouble. It consists of a small plate, shaped like a fish tail, as in Fig. 1, and operated by a small hinge set close to the existing catch. Fig. 2 illustrates a good form of safety catch, known to jewellers as the Tiffany catch.



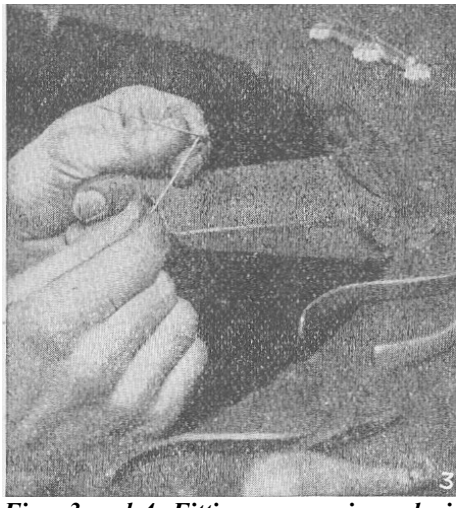
Brooch. Fig. 1. Fish tail safety cath fitted to a brooch.

Figs. 2, 3. Tiffany catch, open and closed.

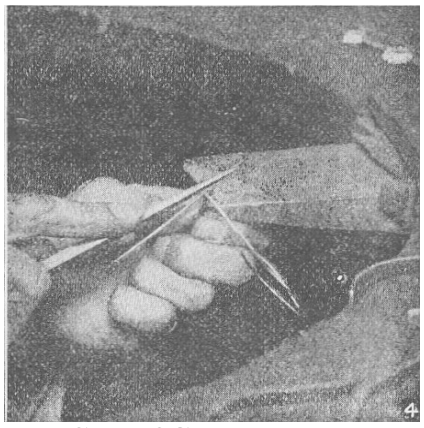




Should brooch pins break or come out, it is quite a simple operation to replace them. Retailers of jewellers' sundries stock brooch pins of all sizes in metal and gold. Perhaps the best investment is to buy a packet of assorted metal pins. If the old pin has broken off and the joint portion is still in the brooch, it can be removed by tapping out the piece of wire on which it is hinged with a stout needle and a light hammer, or the side of a pair of pliers. Take from the packet a pin long enough for the brooch, and, holding the head in the pliers, carefully file from each side of the joint sufficient to allow the pin to fit the gap from which the broken piece has been removed. Then take a piece of brass wire and file it slightly taper, so that it will go into the hinge, and force it home, as indicated in Fig. 3. Afterwards, with a file, nick the wire on each side of the hinge, as shown in Fig. 4, break it off, and finish by filing it flush.



Brooch. Figs. 3 and 4. Fitting a new pin and nicking it with a file previous to filing flush.



Care of Gem Brooches

Long bar brooches, if set with stones, should not be used to fasten thick material, as the weight of the material may strain the setting, so that the stones become loose and drop out. If the pin has got strained and lost its spring in this way, it can be temporarily restored. Hold the brooch in the left hand, and, with the thumb and first finger of the right hand, gently bend back the pin close to the joint. All brooches set with stones should be examined periodically, to make sure the gems are tight and the settings in good order.

A brooch set with jewels may be cleaned with warm water, a few drops of cloudy ammonia and an old toothbrush. Do it in a hand-basin and not over a lavatory basin or sink. Should a stone be lost in this way, open the trap fitted in most waste-pipes, as the gem has probably been stopped in this. Mothers with young children should not wear brooches unless fitted with a point-protecting device.

Sometimes a brooch pin will turn up at the point, and on withdrawing will bring with it a thread of the material. The point can easily be straightened out. Hold the pin flat on a hard surface and, with a steel knitting needle, as though sharpening a pencil, press straight the distorted point. A pin that is blunt at the point may be sharpened with a few rubs on a piece of emery cloth.

BROODER. This is the name given to a heated chamber connected to one or more outer chambers or chicken runs. It is an adjunct to the chicken incubator, and is used in order to raise chickens artificially when it is not possible to make use of a sitting hen. *See* Chicken; Poultry.

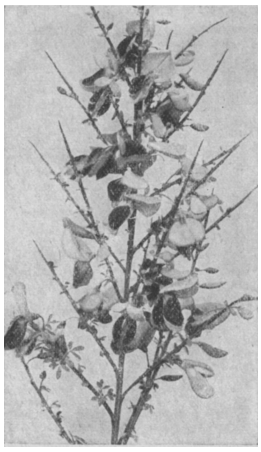
BROODINESS: How to Cure. This condition in a hen is characterised by a peculiar clucking noise accompanied by feverishness, indicating the desire to sit. Apart from clucking, the desire to sit is further evidenced by the hen sticking tight to the nest. She should either be allowed to obey her instincts by being entrusted with a sitting of eggs, or broken of the habit.

To break up a broody hen, as it is termed, is quite a simple matter if taken in hand in the early stages. At the first indication of broodiness, remove the hen to a coop with a slatted floor, that is, a floor composed of laths nailed crossways two inches apart. The coop is

raised from the ground by bricks placed at each corner so as to allow of a free current of air beneath.

In such a coop it is impossible for a hen to sit with any degree of comfort, and, being obliged to roost willy nilly, she quickly loses the desire. A few days' confinement will suffice to cure her, and in the course of a week or so she will resume laying. *See* Poultry.

BROOM: The Plant. This name is given both to cytisus and genista, hardy spring and summer flowering shrubs of great garden value. They thrive particularly well on poor or light land. When planting brooms it is important to choose small plants which have been grown in dower pots, not in the ground.



Broom. A favourite hardy broom (Cytisus adreanus), bearing red and yellow flowers in early summer.

Some of the brooms are tall shrubs suitable for grouping in the flower garden and shrubbery; others are of low growth and may be grown in the rock garden. Of the tall kinds, which bloom in spring or early summer, some of the most beautiful are Cytisus albus, white, praecox, cream, scoparius, the common yellow broom and its variety andreanus, bronze red and yellow. Beautiful low growing brooms are Cytisus Ardoinci, yellow, kewensis, cream, and Beanii, yellow. New varieties have flowers of brilliant colours. The genistas are in full beauty in summer—all have yellow flowers. The brooms come readily from seeds, which may be sown outside as soon as they are ripe, or in spring in a cold frame. Cuttings strike in sandy soil if inserted under a hand-light in summer or early autumn. Layers may be put down in autumn.

A greenhouse species, genista fragrans, grown by market gardeners, is a neat shrub with small, sweet-smelling golden flowers, continuing in bloom for a long time. It is grown in soil composed of two parts loam, one part peat and sand. Propagation is by cuttings in spring, preferably in a propagator. Small pieces of the new wood root readily in sandy peat, the more so if a heel of older wood is taken with the cutting. The plants which result should have the points taken off when they are 6 in. high, in order to cause them to break, and the side shoots thus obtained should also be stopped when about 4 in. long; this ensures neat bushes with several branches.

From May to midsummer the plants may be kept in a cold frame, and watered and syringed regularly. From that time to October they will be better on a bed of ashes in the open. They should be housed in autumn. A winter temperature of 45° to 55° will suit them. After they have flowered they may be cut hard back, repotted, and syringed. They will then break afresh, and, after the necessary cuttings have been taken may be hardened in the frame.

BROOM: For Sweeping. Brooms are made of bass, white fibre, horsehair, bristle, and coconut fibre. The stocks or handles are of alder, birch and beech, and with the exception of certain bass brooms, the knots are invariably set with pitch. The so-called hair broom, for household use, in best qualities is of pure bristle at least 4 in. in length. Other qualities are less economical in the long run.

Points to look for in a good broom are the long, springy flag-ended bristles and the even pitch-set knots, with the outer row of knots well spread. It may be found that the outer knots are small and close made of bristle, with the inner knots large and composed of inferior mixtures. These can be detected by placing the hand across the surface of the broom and noting the greater readiness with which bristle will spring back when released, as compared with the less springy substitute. The knots in a good hair broom are set outwards to obtain the maximum spread for the sweeping surface.

If the tufts of hair are stuck in with pitch, known as pan work, the holes should be well filled and a neat ring of pitch be visible at the edge of each hole, and there should be no waste of space inside the outer row of knots. When not in use a broom should be stood up in a reverse position or hung up. The best carpet brooms are made of Venetian whisk, straight, stiff, and durable. In most homes the carpet sweeper has ousted the carpet broom for floor sweeping, but it is still employed for upholstered furniture. Superior makes are fitted with plush protectors at each end of the stock, thus minimising risk of scratching fragile furniture, polish, etc.

In the yard or outdoor broom pure bass serves best. For very hard wear these are faced with knots of cane or whalebone. Water will not deteriorate bass, but stiffens and keeps it in condition, so it is suitable for washing-down purposes.

The common coconut fibre broom is a cheap substitute and valueless. For hard wear, as in stable use, whalebone is mixed to give an added stiffness and durability, and in the case of heavy scavenger brooms the front row of holes is filled with split cane.

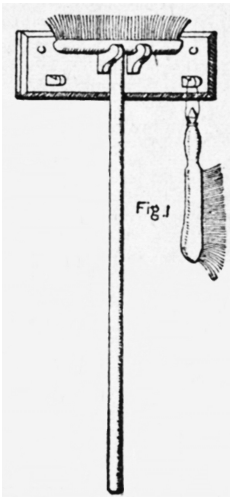
To obviate slipshod attachment of the handle an attachment can be procured which will enable the broom to be used both ways, trebling the life of the bristles, and the two-way metal attachment fits and secures any ordinary broom-handle.

For sweeping up the litter made by falling leaves, cut grass, and so on, the garden broom or besom is highly satisfactory.

Garden brooms are made from birch twigs, cut from the trees after the periodical clearing of woods which is constantly going on. The twigs selected are up to about four feet long, and these are bunched with the strong ends level, and then tightly bound together with strip or split cane, one strong binding at the end and two or more at intervals of a few inches. A stout staff with pointed end is then driven up through the tied ends to

make a handle, which is fixed by a plug passing between the bindings and through a slot or hole previously cut in the handle. *See* Brush.

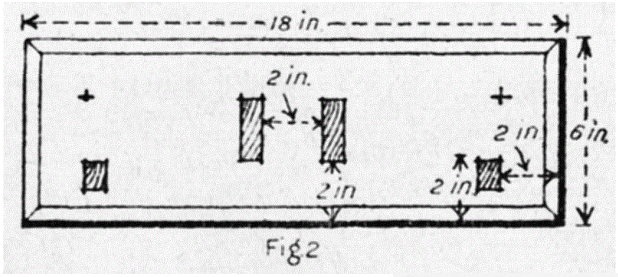
BROOM RACK. This is a useful article for the home, and will also commend itself for the ease with which it may be made, and the small amount of material required. Fig. 1 shows the rack complete, consisting of a wood back, with pegs to hold brushes and brooms. Details of the rack appear at Figs. 2 to 5. A hardwood, such as birch elm, could be used, or ordinary deal would be very suitable. The best finish will be with stain or varnish, or varnish alone.



Broom Rack. Fig. 1. The completed rack.

The back, as at Fig. 2, is 1 ft. 6 in. long by 6 in. wide, and should not be less than ¾ in thick. The long pegs for the brooms, two of which will be required, are shown at Fig. 3. and must be cut from wood ¾ in. thick. A tenon 1 in. deep by ¾ in. long is formed at the back end of these pegs for fixing to the back of the rack. The shorter pegs for hand brushes are seen in Fig. 4, and at the back end of each peg a tenon ½ in. deep by ¾ in. long is formed. Figs. 3 and 4 show ½-inch squares.

Mortises are cut through the back of the rack to receive the tenons on the ends of the pegs, and a chamfer about ¾ in. square is cut around the edges of the back, as at Figs. 2 and 5. The pegs are glued to the back. For hanging the broom rack, two holes should be bored through the back, so that it may be fixed to the wall with a couple of brass-headed nails.



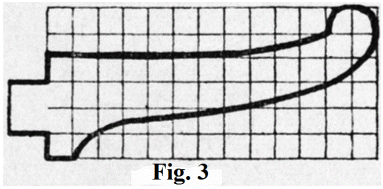
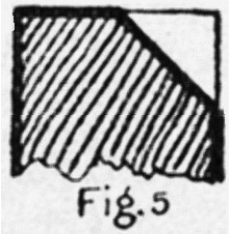
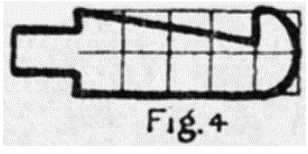


Fig. 3





Broom Rack. Figs. 2-5. Diagrams showing working details of the parts

BROSE. This dish of Scottish origin may be prepared with pease meal. Put two tablespoonfuls of this into a basin and stir into it 1½ gills boiling water. Put the mixture into a saucepan and boil carefully for 5 min. Season with salt and pepper, add a piece of butter the size of a walnut and serve very hot with milk.

For another variety of brose, break sufficient stale brown bread into ½ inch pieces to fill a ½ pint measure, and stale white bread to fill a ¼ pint measure. Put these brown and white pieces into a double-pan, add 2 oz. of butter and ½ pint of milk, then cook it until the bread is quite soft and the milk absorbed. Add salt or sugar to taste, and serve in hot porridge bowls. If the bread is very stale more milk will be necessary. It is best not stirred during cooking.

BROTH. The unclarified stock made from beef, mutton, veal, chicken, etc., is garnished for broth with neat cubes of the best parts of the meat, and vegetables used in its preparation, with the addition of a little rice or pearl barley boiled in it.

BROWN: In Clothing. For autumn and winter wear, brown in varying shades is always in fashion, as the colour is warm and looks well in heavy fabrics. For women there is also the advantage that it tones with most furs. For country, sports and travel wear, brown is a good choice, as it does not show dust, and smart accessories for both sexes, shoes, boots, knitted wear, scarves, etc., can be obtained in this range more easily than in any other colour. Lighter colours can be successfully dyed brown.

BROWN BOOTS: Their Care. In making brown leathers for boot uppers, it is essential that the boot maker should use skins which are free from defects. After tanning the raw skins it is customary to sort them over carefully, and to employ those which are at all defective for lower grade blacks. This influences the price of the finished boot or shoe, so that good brown boots are dearer than black.

After a few days' wear cheap brown boots lose their smart appearance. This may not be so noticeable in the case of cheap black footwear, as manufacturers can more readily fake the uppers of the black boot after the latter has been made. But with brown boots touching up can only be done on a small scale with a pigment finish. Such finishes consist of a pigment colour similar to those used in paint manufacture, and some binding substance like shellac. When this is applied to the defective grain surface of the leather, the tiny particles of pigment fill up scratch marks, etc., forming a smooth surface. After a little wear this finish becomes ineffective, and the boot begins to look shoddy.

Cleaning and Reviving. No polish should be applied to the surface of brown or coloured boots until all the dust has been removed, otherwise the bright brown tone of the leather will gradually dull. If it is desired to revive the original colour, the following

method has been found satisfactory. The boots are placed on trees and brushed with a warm solution of soft soap. Ordinary soap is useless for this purpose. This is then washed off with clean water, soft soap rubbed into the leather and allowed to remain until nearly dry, when the excess of dry soap should be wiped off with a damp rag and the boots allowed to dry thoroughly. If a good polish of the required shade is applied the brown boots should look like new.

Trouble is often occasioned by grease spots on brown boots. Apply a paste of fuller's earth, which should be left to dry before wiping off. It absorbs most of the grease without taking out the colour, and a second application should complete the absorption. If water or rain spots are allowed to dry, the leather is likely to be spotted with light patches. For these blemishes make a strong decoction of shag tobacco, and lightly touch them with the liquid until they resume the requisite deeper shade. Then apply a good polish to the whole surface.

Black Boots from Brown

To convert brown boots into black needs care if the job is to be undertaken at home. First, all dirt should be removed with a clean brush. Then polish is removed by going over the upper with a cloth or sponge soaked in petrol, followed by a similar application of methylated spirit. This, of course, must be done in the open, away from naked lights. The boots are allowed to stand for some time in the open air, in order that all the petrol left in the leather may volatilise. The surface is next lightly rubbed with a cloth dipped in either a weak soda solution or some weak ammonia, after which the uppers are wiped over with warm water.

By this time all foreign matter should have been removed, and the cleaned surface is ready for the dye, which can be bought at any leather goods or oil and colour stores. Two applications or more will be needed, then the boots are allowed to dry, slowly and thoroughly. They must not be put in front of a fire to dry. Finally, the uppers are blacked over with a good black boot polish.

Brown Boot Polish. The pastes employed for shining brown leather boots have a basis of beeswax and turpentine, the yellow colour being given by an aniline dye such as bismarck brown or phosphine. It is sometimes necessary to remove stains and discoloration before applying polish to brown boots. The best cleanser is a thick cream of gum tragacanth to which 2 per cent, of oxalic acid has been added. *See* Boot.

BROWN BREAD. Unfermented brown bread can be made in this manner. Mix well ¾ lb. wholemeal with ¼ lb. white flour, 1 teaspoonful each salt and sieved carbonate of soda, and two teaspoonfuls sieved cream of tartar. Rub finely into these 2 oz. margarine, butter, or dripping, and mix to a soft dough with about ½ pint milk Knead quickly and lightly, and shape into round loaves. Gash rather deeply across the top, place on a floured baking-tin, and bake in a quick oven for about 30 min., or till well risen, lightly browned, and firm in the centre. If there is butter milk or sour milk, use that for mixing, and only one teaspoonful of cream of tartar. *See* Bread.

BROWN BREAD PUDDING. Make 4 oz. brown breadcrumbs by rubbing stale bread through a wire sieve. Put 1½ oz. butter into a basin, warm slightly, and add 2 oz. castor sugar. Beat these with a wooden spoon and stir the yolks of 2 eggs into the creamed mixture, then add crumbs, grated rind of a lemon or an orange, a few grains each of grated nutmeg and powdered cinnamon, and a gill of milk. Mix all together and stir in lightly the whipped whites of the eggs. Pour the mixture into a well-greased basin, twist a piece of greased paper over the top, and steam the pudding gently for 1 hour. Turn out to dish, and pour round the pudding hot jam or other sweet sauce.

BROWN HOLLAND. This plain, unbleached linen fabric for children's dresses and the like is imitated also in cotton. The window holland, usually brown and employed for blinds, is almost always of cotton, finished in a special manner to throw off dust.

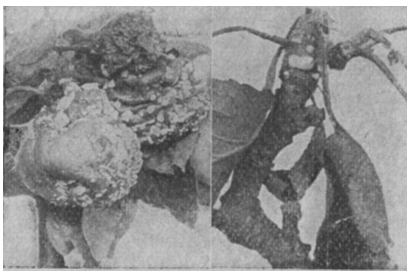
BROWNING. For colouring soups, gravies, and puddings, this is sold in bottles, but may be made at home. Put 4 oz. white sugar into a saucepan and stir over a low fire till the sugar is melted. Boil gently, and when it turns a rich brown, pour into the pan ½ a pint water. Boil gently until the consistency of warmed treacle; stir occasionally, and skim if necessary. Cool, pour into a clean bottle, and cork for use. Well-made browning should be neither bitter, from overcooking, nor sweet, from insufficient colouring of the sugar.

BROWN JOHNNIE PUDDING. An excellent steamed pudding made by mixing 6 oz. each flour, finely chopped suet, and golden syrup with 1 tea spoonful ground ginger. Beat an egg frothy, mix with ½ a gill milk, and beat these into the flour, etc. Have ready a thickly-greased basin, and the water boiling in the steamer.

Put one teaspoonful of bicarbonate of soda in a small basin, mix smoothly with two teaspoonfuls of milk, and stir thoroughly into pudding mixture. Turn it at once into the basin, twist a piece of greased paper over the top, and steam for two hours. Turn out on to a hot dish, and pour round it some hot sweet sauce.

BROWN PAPER. Brown paper is sold in sheets, the most ordinary size being 29 in. by 40 in., with 24 sheets to the quire. Three qualities are obtainable, according to the thickness required.

BROWN ROT: To Prevent. During the summer and early autumn fruit trees are frequently attacked by a disease which produces on the fruit soft brown areas. These increase in size until the whole fruit is affected.



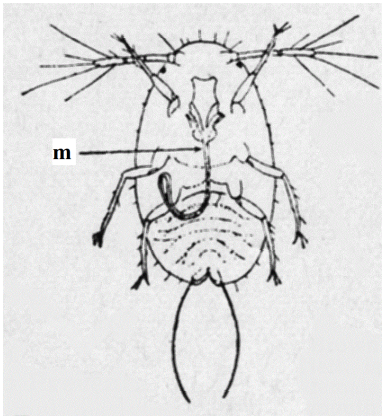
Brown Rot. Left, apples affected by rot. Right, fruiting spur, showing putules of the same fungus.
(By permission of H.M. Stationery Office and the Ministry of Agriculture)

Diseased fruits which become attached to the tree gradually dry up and shrivel, and these produce a new crop of spores and spread the disease.

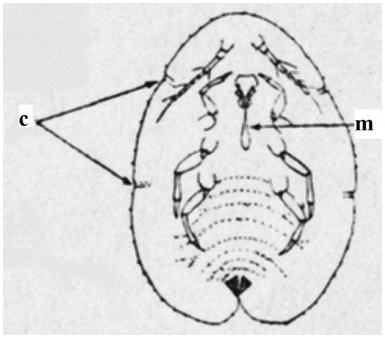
The best preventive measure, as is pointed out in Leaflet No. 88 issued by the Ministry of Agriculture, is the removal and destruction of all mummified fruits during winter. They should be collected, and either burned or deeply buried. All infected spurs, together with cankers on the stem, should be cut out.

When fruit is to be stored, the greatest care should be exercised in discarding all fruit showing signs of brown rot, for the disease will not only continue to develop in the affected individuals, but will spread to others. It is advisable to spray with a tar-oil wash in winter and with Bordeaux mixture before the blossoms open and again as soon as they have fallen. *See* Apple.

BROWN SCALE: How to Spray. Gooseberry, currant, peach and nectarine are all liable to the attacks of the insect known as brown scale. The insect leaves a pale scar when removed from a twig, and it has a preference for the older branches. The remedy is winter and spring washing, of which particulars are supplied in leaflet No. 88 issued by the Ministry of Agriculture.



Brown Scale. Right, undersides of larva. Below young female, highly magnified; **m=** *mouth;* **c** *=channels to respiratory tubes.*

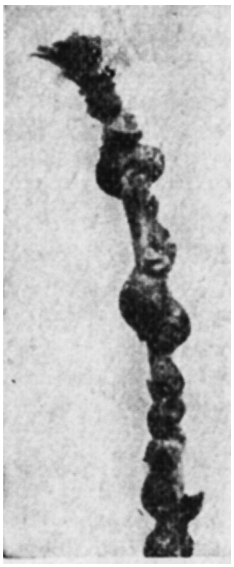


Complete pruning before spraying operations are commenced; and in old and badly infected trees remove as much of the old wood as possible. The spraying apparatus should have the nozzle fitted at an angle of about 45 degrees so that the spray may be conveniently directed to the undersides of the branches where the insects are usually more abundant.

The best winter wash is lime-sulphur. The concentrated lime-sulphur solution can be bought ready made, and should be diluted to winter strength —3 quarts of lime-sulphur (1.3 specific gravity) to 10 gal. water. A good paraffin emulsion is:

Paraffin	**2 pints**
Soft soap	**2 lb.**
Water	**10 gallons**

Dissolve the soft soap in about a gallon of boiling water. Remove the soap solution from near the fire, and while still hot add the paraffin. Churn the mixture very thoroughly, add soft water to make 10 gal., and make sure that there is no paraffin floating on the surface.



Brown Scale. Right, peach twig affected by brown scale.

BRUISE: Its Treatment. The colour of a bruise is due to the blood which has escaped from the vessels into the surrounding tissues. It is usually at first a bluish-black.

To prevent the further escape of blood into the tissues, an ice bag or a series of towels wrung out in cold water should be placed over the part. The ordinary lead water and opium lotion poured on a handkerchief and then bandaged loosely over the bruise is a good home remedy.

If the skin is broken, and oozing is taking place on the surface, wash the part well with running water for a few minutes and dust it thickly with boracic acid powder or paint with tincture of iodine. Then apply a piece of boracic lint, and bandage as firmly as is comfortable. Place the lower part at rest; if a lower limb, elevate on a pillow ; or the upper, place in a sling. A hot bath taken soon after the injury will help to relieve pain and stiffness. After a few days massage the part gently. *See* First Aid; Sprain.

BRUSHES FOR HOUSEHOLD AND GARDEN USE
How to Choose and Keep Them in Good Condition

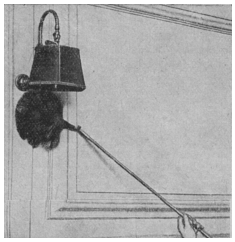
Further details will be found under such headings as Boot Brush; Clothes Brush; Paint Brush; Tooth Brush. See also Broom; Carpet Sweeper; Vacuum Cleaner.

Brushes are divided into two kinds, simple and compound, according to the way they are made. The former consist of one tuft only, an example being the brushes used by the artist; and the latter of more than one tuft, among them being most of the brushes used in the home. Brushes in which the tufts are placed side by side are known as stock brushes.

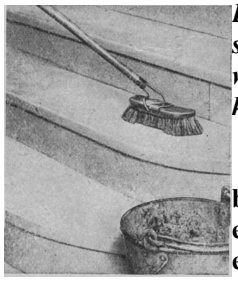
The principal raw material used in the manufacture of brushes is bristle, almost wholly pig or hog bristle. This is collected, partly sorted, and sold in lengths from 1½ to 7 in. It is dressed, combed, and mixed before being made up according to the particular class of work for which it is intended. Bristle is exceedingly springy, and will maintain this property under ordinary conditions until worn away by use. Hence the chief value of bristle for making brushes.

Materials Other Than Bristle

Among other materials used are fibre (Mexican grass), Mexican whisk, Bahia bass, and horsehair. Fibre and drafts (horsehair) are the chief materials used for mixing with bristles as well as for substitutes. Skunk fur is used for a light dusting brush with an adjustable head convenient for edges of panelling and for lighting fixtures, as shown in the illustration. A finely cut rubber brush, arranged in a spiral round wire is excellent for cleaning bottles and vases.



Brush: two labour-saving patterns. Right, light brush of skunk fur, with adjustable head, for dusting lighting fixtures.



Left, scrubbing brush with long handle working on a swivel, which saves kneeling.

For fancy brush handles and backs, rosewood, satinwood, and ebony lend themselves to an excellent finish. Owing chiefly to the increasing cost of bristles, imitations and substitutes are plentiful and lead to unsatisfactory wear in some cases.

Scrubbing-brushes made of a mixture of fibre and bass, and known as union, are cheap and serviceable. The one illustrated with a long handle working on a swivel saves kneeling and stooping. Shoe, stove, and similar brushes are made with the root end of bristles obtain the required stiffness. Best makes are wire-drawn, with screwed-on backs. Small hand brushes bristled both sides are convenient for removing dust from cushions and rugs. Racks for holding brooms and brushes are illustrated under the heading Broom.

Fibre and Bristle. High prices call for an examination of brushes used for decorating. A common fibre brush is intended for rough work where lime is used. Whether tied on the handle in two knots with wire or string, or nailed on with tin or leather, a good finish is usually an indication of a well-made brush. The sash brush or tool of more than a dozen sizes is best made in a forked handle, and bound with a string or copper wire. The bristles are held together with a cement of resin and oil, and pulled into the handle while they are hot.

The distemper or whitewash brush with two knots is an expensive article. Five to 6 in. bristle is used, and the wire, which should not be stinted, may be secured by solder at the corners. All first quality distemper brushes are stamped pure bristle, or covered with a similar guarantee. Black China bristle, while good in appearance, does not compare in usefulness with other bristles, mainly because it does not carry or hold paint or distemper.

A moderate adulteration of bristle with fibre and horsehair is quite acceptable for ordinary purposes. A popular brush, and one that has replaced many more expensive varieties, is the flat tin varnish. These are made of China bristle, and in sizes of an inch and upwards, and are intended for general use, including varnish work. They are usually bevelled at the top of the bristle, which gives them the appearance of a part-worn brush.

A common fault with all paint brushes is the presence of free or loose hairs, which have not been caught by the cement or held by pressure, and one by one come out to spoil work and weaken the brush. Passing the hand over the top of the bristles, as if to test the spring, will cause these undesirable hairs to rise, and any considerable quantity denotes an unsound article. These loose hairs are particularly objectionable in pastry brushes.

In the process of making, paint brushes have probably been subjected to extreme heat and other unhealthy conditions, and manufacturers frequently issue instructions to purchasers which should be strictly observed, or the maximum of wear will not be obtained. During intervals of work paint brushes should be suspended in the paint or distemper and not allowed to rest on the working end, otherwise they will become clogged and for a time unworkable. Before putting aside after use, they should be thoroughly cleaned and ready for use on the next occasion. Much can be done by wiping out on old boards, and water will remove any remaining whitewash or distemper.

Paint, varnish and enamel brushes must be softened and squeezed out in a little turps or paraffin, and finished with a warm solution of soap and hot water, working on a stone sink or board and removing all traces of turpentine or paraffin, as this destroys any cement in the brush.

BRUSSELS CARPET. The floral designs in worsted Brussels are seldom in use, but the hair carpets, made from cowhair, and sold in natural, undyed grey or brownish mixture colouring, and also in many good shades, are tasteful, durable and cheap. Black or coloured borders to these squares look well in small living rooms and for bedrooms. For a stair and passage carpet it is more dependable in the undyed than in the dyed shades. *See* Carpet.

BRUSSELS SPROUTS. The leaves at the top of the Brussels sprouts stem are excellent as a vegetable, but should be left until all the sprouts have been

gatherered.

The seed is sown outdoors early in April, and the seedlings are planted finally in June or July. For an early autumn crop seeds are sown in a frame in February.



Brussels Sprouts. Plant with many sprouting shoots.

Loose sprouts are generally the result of over-crowding and too light a soil, which, perhaps, has been badly dug. Directly the lower leaves turn yellow, and part company with the stem under slight pressure, the sprouts may be removed, but there must be no wholesale clearance of the leaves. The stem is cleared of sprouts from the bottom upwards.

The best varieties include Exhibition, London Market, Aigburth, and Standard. Medium-sized plants, with medium-sized sprouts of superior flavour, are given by such varieties as Matchless, Wroxton, Scrymger's Giant and Imported. Smallest of all is Dwarf Gem. It is an excellent little variety that reaches maturity much more quickly than large varieties. Moreover, while the larger varieties require at least 2½ ft. each way to give of their best, 18 in. suffices for Dwarf Gem.

The enemies of Brussels sprouts are the same as the pests of other greens, with the addition of the cabbage snowy fly (q.v.).

How to Cook. The usual method of cooking this vegetable is by boiling. Trim, rinse under cold water and leave to soak for an hour in cold salted water. Drain them and put into a saucepan of boiling salted water. If using hard water put in a small saltspoonful bicarbonate of soda, for hard water spoils the colour of green vegetables.

Boil quickly until they are soft through, but not broken, probably for about 15-20 min., and then pour into colander, drain and return to pan. Add for 2 lb. sprouts ½ oz. butter, a little dust of pepper and a few grains of grated nutmeg.

Brussels sprouts au gratin form an excellent supper or luncheon dish, prepared with 1 lb. cooked sprouts and cheese sauce. *See* Au Gratin; Cheese Sauce.

BRUSSELS SPROUT SOUP. This delicate green purée can be made entirely with milk. Cream increases nutriment and richness, but is not essential.

Trim and wash 1 lb. Brussels sprouts and put in a saucepan of fast-boiling salted water, with a small onion and a very small saltspoonful of bicarbonate of soda. Boil quickly until they are soft. Drain off water and with a wooden spoon rub them through a sieve. Put back these sieved ingredients, or purée, stir in one quart of boiling milk and reheat without letting it actually boil, or the colour will not be so good. Add one gill cream and season carefully. The soup should be as thick as good cream, so add more liquid, or a little thinly mixed cornflour, and reboil it, even should the colour suffer, if the consistency is wrong.

BUBBLE AND SQUEAK. Use up ¼ lb. cold potatoes, 2 oz. fat cooked bacon, ¼ lb. of cold cabbage or other cooked vegetables, some pepper and salt, and some fat for frying. Mash potatoes, chop cabbage, cut bacon into small squares and mix all together with seasoning. Heat the fat in a frying pan, and fry the mixture until brown on both sides; then shape into a flat cake. It should be served very hot.

BUCKET: For Household Use. The strength and durability of galvanised buckets can best be judged by the weight. A common bucket with seamed sides weighs about 3 lb., a good quality riveted about 5 lb., while a very strong contractor's bucket with a welded iron hoop around the rim or a similar hoop at the bottom weighs about 10 lb. These weights are for the 12 in. size.

Fire buckets, enamelled red or blue, weigh about 4 lb., and when used for fire protection purposes should be hung on a bracket, and always kept full of water.

For home dairy purposes, enamelled buckets are used, but once chipped they should be discarded as there is a risk that a small particle of the enamel may get into the milk.

Wood pails for stable use made of oak have narrow galvanised iron hoops. They need to be well looked after, otherwise the wood shrinks or they develop leaks.

The enamelled bucket, with or without lid, quickly becomes rusty if no attention is paid to keeping it in good condition and free from dirt. A convenient form of housemaid's pail has an exterior receptacle for a scrubbing brush, and a small one for holding the soap. Another pattern has an interior receptacle and a cinder sifter that facilitates the process of cleaning the grate.

Ordinary galvanised buckets are quietened by binding the handle or bail with cord, or fitting a rubber ring. An enamelled bucket that has been chipped can be treated with bath enamel applied to the damaged places, and put on in the same way as for a bath.

BUCKRAM. A stiff material made of very coarse linen or cotton, and usually stiffened with glue, buckram is used to stiffen the edges of articles in dressmaking and fancy work, etc., or as an interlining.

BUCKSKIN. Deerhide or sometimes sheepskin, tanned in a particular way and dressed with oil to render it flexible, is used under the name of buckskin to make riding breeches and gloves.

Buckskin may be washed with soap and warm water, rinsed and dried, but this dries and stiffens by removing the oil dressing. An ounce of yellow ochre rubbed into a paste with a teaspoonful of salad oil, and then mixed with water into the consistency of cream, may be applied to the leather. The garment should be hung to dry and the paste be removed afterwards with

a soft brush. The pliability can in large part be restored by rubbing the leather between the hands.

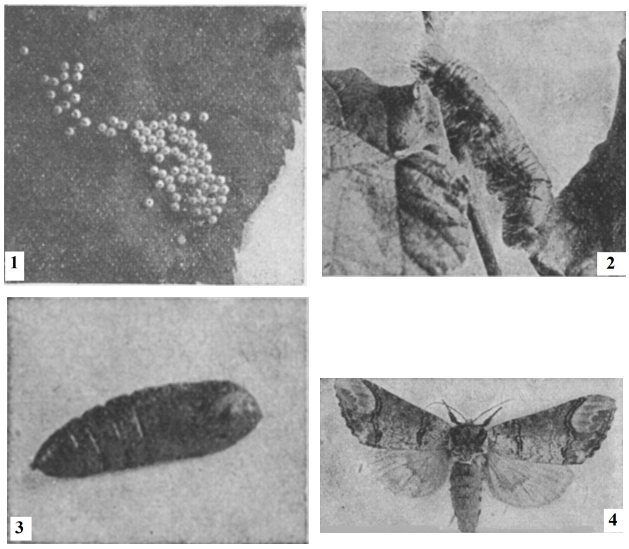
BUDGERIGAR. There is no parakeet more popular than the little green bird with the primrose forehead commonly called the budgerigar. It thrives best in an aviary, but may be kept in a cage, and as it practically lives on millet seed, feeding is a simple matter. It greatly enjoys greenstuff in the shape of the grass of canary seed, which may be easily propagated in a pan. Fresh water and gritty sand must always be within reach. A pair can be used for breeding, the season being from April to July. As a parakeet, the budgerigar is subject to importation regulations given under parrot (q.v.). *See* Aviary.

BUFFET. Antique buffets belong to the oak period and were frequently designed and made in the 16th and 17th centuries. These are still copied and somewhat similar pieces are to be found in Jacobean style oak for use as sideboards or as hall furniture. The word buffet also denotes a long table at which refreshments are served at an entertainment; or a side table and the cold meats, etc., placed thereon at meal times. *See* Sideboard.

BUFF KNIFE. The buff knife or scraper is used in the repairing of boots and shoes, more particularly in the finishing stages. A buff knife should be sharpened by thinning the edges and then turning them over by rubbing flat on the edge with a smooth steel rod. This turns up a burr or slightly raised portion, which forms the actual cutting edge. *See* Boot Repairing.

BUFF-TIP MOTH. This common moth is generally distributed over Great Britain, but is most abundant in the south of England, where in late summer its caterpillars defoliate branches of elm, hazel, lime, oak and sallow. With the wings extended to full width of nearly 2½ in. the moth is very striking and conspicuous; but the living insect at rest with the wings closed round the body may be mistaken easily for a decayed twig broken roughly. The forewings are brown-grey, paling to silver-grey on their hinder margin, and the tip of each bears a large oval blotch of pale buff. The hindwings are pale yellow.

Appearing in June or July, the female moth deposits her eggs in batches on the leaves of the trees named above, to the number of 60-80 in a batch. These are whitish above, with a dark dot in the centre and dark beneath. They hatch in about a fortnight, and the softly-hairy yellow caterpillars, with longitudinal broken lines of black, feed in company until nearly full grown. In September or October they change to purple-brown chrysalids on the surface of the earth. The caterpillars being warningly coloured are immune from the attack of birds, but by smartly jarring the attacked branches with a stick numbers may be brought down into an upturned umbrella or sheet, from which they may be collected and destroyed.



Buff-tip Moth. 1. Eggs. 2. Caterpillar. 3. Chrysalis. 4. Perfect Moth.

BUG. Although the word is frequently used in the American sense to indicate any kind of insect, it is applied correctly to insects of the sub-order Hemiptera, which live by imbibing the juices of plants or animals. The bed bug is a well known example of the animal feeders, but the great majority—there are about 450 British species—confine their attentions to plants.

The plant-feeders in Great Britain seldom occur in sufficient force to cause appreciable damage; but in other lands they include the mosquito-blight of the Indian tea-gardens, the chinch-bug that attacks corn and the cotton-stainer that depreciates the cotton crop.

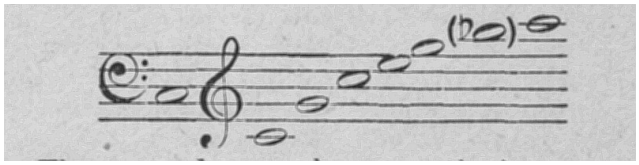
The bug, or bed bug, is a flat, oval insect, a fifth to a quarter of an inch in length, with six legs and a pair of antennae before the prominent eyes. Its colour is chestnut-brown or a mahogany tint. It has a characteristic odour which helps to make it a pest. Introduced from abroad about three centuries ago, the bed bug spread rapidly and settled in wainscoting and heavy furniture. To-day, with our cleaner habits, it is less abundant; but the most scrupulously clean houses may be invaded by its walking in, or by its introduction with furniture, either from factory or sale-room.

To allay the irritation set up by its attack, the affected part should be touched with liquid ammonia, sweet oil or tincture of iodine. Any article of furniture known to harbour the bug should have its suspected corners and crevices painted with either of the petroleum oils applied with a painter's sash tool. Where the infestation has assumed more serious proportions, the room should be fumigated with sulphur, all crevices of windows and doors, as well as the chimney, being made tight, and the door kept closed for 24 hours after the sulphur has been ignited.

The bed bug has been convicted of acting at times as carrier of the germs of relapsing fever, and it has been suspected of transmitting other diseases. Cockroaches

eat bugs, and the same good office has been attributed to the minute reddish ant, which is itself a pest in some houses. *See* Ant; Apple; Cockroach.

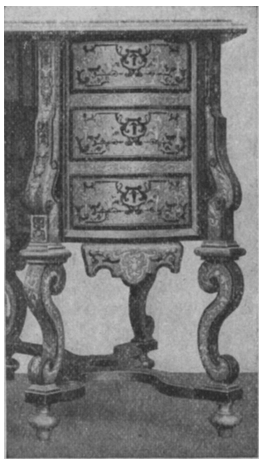
BUGLE: How to Sound. The bugle is akin to the trumpet, but has a shorter and more conical bore; it is used chiefly for calls in the army. The sounds that can be produced are the natural harmonic series:



These sound a tone lower, as the instrument stands in the key of B flat. It is always written for, however, in C. Of the above sounds, the lowest C (fundamental) is of weak tone, and is not used. The B flat also is rather too flat to be available, while the highest C is not employed for the army calls.

The instrument should be held firmly, but not too tightly, in the middle of its thickest portion, not too near the mouthpiece. The lips being placed to the mouthpiece in such a way that none of the breath is wasted by escape at the side, the player utters the syllable "too," the tongue being between the lips and quickly drawn back. The first endeavour should be to produce the middle C as a holding note. When this can be done with certainty, it may be varied rhythmically by the device of tonguing ("too-too"), and subsequently the other notes can be produced by means of increased pressure.

BUHL. The chief characteristic of buhl, or boule, work is the application of thin coats of tortoiseshell veneering on prepared wood. The surface is inlaid with delicate tracery in metal, especially brass, and these inlays are adorned with tortoiseshell tracery. Brass feet, bracket, edgings and other ornaments are also used, either to protect the corners and edges of the piece or for decorative purposes.



Buhl Work. End of a commode made of pine with brass, ebony and tortoiseshell marquetry work; early 18th century. (By permission of the Director, Victoria and Albert Museum)

Trouble with the brass inlay in buhl work is prob-ably due to the perishing of the adhesive used in the laying. In the endeavour to press the brass back into position a kink often develops, and this must be removed as far as possible by taking out sufficient brass to enable the inlay to be hammered on something hard slipped under.

Shellac cement, either heated or reduced to a thick consistency in methylated spirit, may answer the purpose. The cabinet maker's method is to use the best Scotch glue of good consistency, and full hot. Have at hand some means of pressure that will apply to the position of the inlay—i.e. a weight, a handscrew, or even a strong 4 in. paperclip may answer; also some flat pieces of wood and brown paper. Apply the glue, using no more than is necessary, to the back of the brass, and press back into position with a hammer-head. Then lay the brown paper over, and the flat wood over this, before applying the weight or handscrew for compression. The brass must be held in position till the glue has set.

BUILDING: THE LEGAL ASPECT

Important Points for the Prospective House Builder

The following article affords a valuable introduction to such entries as Architecture; Bungalow; Cottage; Garage; House. See also Drains; Garden; Sanitation

The man who proposes to build his own house should first of all familiarise himself with the exact legal character of the intended property, and the obligations that may be laid upon him, particularly by local authorities.

In Great Britain certain acts of 1925 made various changes in the land laws, in the direction of greater simplicity. Land may be either freehold or leasehold. Freehold means that land and the house upon it are held in fee simple, and is the nearest thing in law to absolute personal ownership of land.

Leasehold means that while a man purchases the bricks and mortar of the house from the builder, he does not purchase the land on which it stands, but hires it on lease for a stated number of years, 99 in most cases, but occasionally 999, at a fixed yearly rental. The ground landlord, besides retaining his proprietary interest in the land, acquires the same interest in the house built upon it, and at the end of the lease can, through his descendants, gain absolute possession of the house. Moreover, the tenant at the time may be obliged, if the house needs repairing, to execute those repairs at his own expense, and in the case of an ordinary dwelling house has no claim on the ground landlord for any part of the outlay.

The holder of a lease of agricultural land has the right to claim compensation from the ground landlord in respect of buildings that have improved the value of the land. But the only protection available to the non-agricultural leaseholder is by way of modifying clauses in in his covenant with the ground landlord, entitling his heirs to get back from the latter a little of what they give him.

More often than not the ground landlord, owing to his tenant's indifference as to what may happen 100 years hence, succeeds in imposing a restrictive covenant that leaves the leaseholder with little choice as to the kind of house he may build or the use he makes of it when built. Restrictive covenants are also attached to the sale of many freehold building estates, but these generally relate to stipulations as to the number of houses to the acre, the prohibition of offensive trades,

building in front of a certain line and so on.

There are three methods open to the purchaser of a freehold house. He may pay the whole purchase price in cash; or he may obtain a fixed or permanent mortgage on part of the value, subject to the mortgagee's right of foreclosing; or he may obtain an advance from a building society, repayable by instalments, plus interest on the capital, each month, quarter or year, according to arrangement. The last is the method usually chosen by those who cannot put down the whole price.

Terms of Contract

When the purchaser has made his arrangements with the builder the next step is the signing of a contract. With this goes the payment of a deposit, in most cases 10 per cent of the total purchase money. The contract binds the builder to finish the house by an agreed date, and the customer the purchase on entering into possession on that date. In the interval a formal deed for the conveyance of the property is drawn up usually by the purchaser's solicitor, who submits it to the other party for approval. In small and straight forward transactions it often happens that the builder's solicitor acts for both parties, in order to keep down the costs; but when investigation of title is necessary, or any other point is involved on which dispute might afterwards arise, the purchaser will do well to have his solicitor.

The charges of solicitors for advising vendors and purchasers of real property are regulated according to the amount of the purchase money. These charges, which are payable by each of the two parties, may, however, be varied by written agreement or reduced by one solicitor acting for both. Both a contract and a legal conveyance must be stamped. The Stamp Act imposes a scale of charges which work out at about 5s. for every £50 of the value, if the latter exceeds £500. When a building society's financial help is required, the borrower is called upon to pay the surveyor's fee and expenses, and a small fee, amounting to 10s. per cent. as a rule, on the value of the loan.

Authority of Local By-Laws

There remains to be considered the purchaser's relationship to the local authority. When the house is to be erected on a developed residential estate, he will find that such matters as the submission of plans for the local authority's approval have been arranged for, and the builder will see to it that the plans involve no breach of the local by-laws. But if the site is on undeveloped land, and the builder does not accept any responsibility for a breach of the local by-laws which the plans may involve, then the purchaser should study these by-laws very closely indeed. By-laws are stringent enough to add considerably to the cost of the house. Recent legislation affecting house building include London Building Act (1930). the Town Planning (1932), Ribbon Development (1935) and Public Health (1936) Acts.

In any case the matter of future road charges should be carefully investigated. Very often a building firm developing an estate will undertake the construction of everything connnected with it, including drainage and roads. The latter are made with the authority's approval; but even then the authority does not renounce its right to call upon the occupiers of houses on a particular road to remake the road at their own expense in accordance with the authority's ideas. The builder may give a personal assurance that no such demand will be made for a number of years, but he will rarely give it in writing, and it is always as well to allow for this contingency in estimating the ultimate cost of the house. The only site that is immune from the danger of road charges is that fronting on a road that the local authority has already taken over and made up.

BUILDING SOCIETY. A building society exists primarily for the purpose of receiving money from its members and lending it to them or to others to enable them to buy or build houses. In the United Kingdom building societies must be registered, and the registrar of friendly societies examines their accounts. The funds of a society must be invested upon mortgages of real or personal property, or in trustee securities. Two-thirds of the money advanced on mortgage can be borrowed by the society.

To become a member of a building society it is usually necessary to buy one or more shares. For these payment can be made by instalments and the member's liability is limited to the shares he holds. In addition, the societies receive money on deposit, paying interest on this according to the state of the money market, but usually giving a higher rate than the banks. Money on deposit can be withdrawn often without notice, although in the case of large sums notice is required.

Money may be borrowed either on building society mortgage or on ordinary mortgage, the security given being a mortgage on the property. In the former case it is for any time not exceeding 15 years, monthly repayments of principal and payments of interest being made. In the latter case, the principal is repaid by quarterly instalments, but these repayments do not begin until three years have elapsed. Interest is paid monthly, as in the case of the other class. The rate of interest varies and commences on the day the mortgage is executed. After the first year it is charged on the balance of the principal which remains unpaid at the beginning of the year. An additional 1 per cent is charged during the first three or four years of the mortgage.

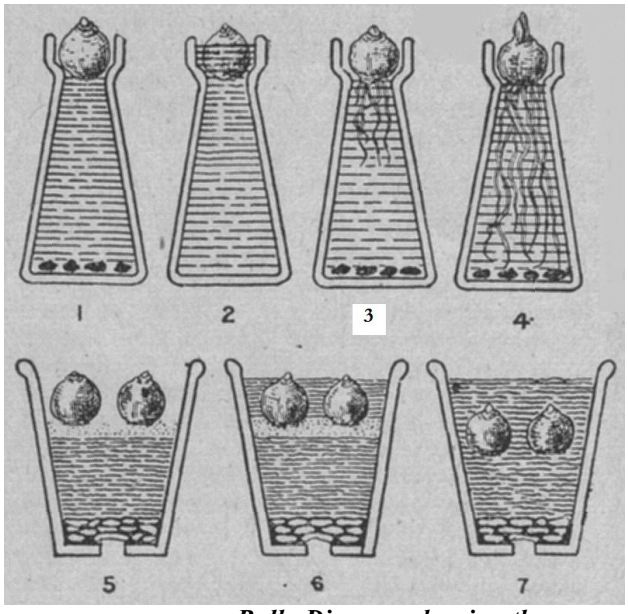
An applicant for an advance should fill up a form of registration and pay a registration fee of 1s. The property to be mortgaged is then surveyed. For this fees average a guinea for each £500 of the mortgage below £1,000, and a guinea per £1,000 above. Extra travelling expenses are liable to be charged for property more than five miles distant.

The officials of the society will, on receipt of the

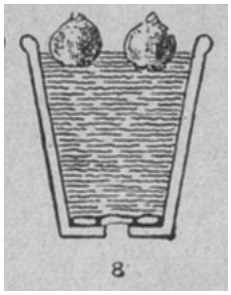
surveyor's report, decide whether or not the advance shall be made. If the decision is favourable, the entrance fees on the shares necessary to make up the amount of the advance should then be paid. The title deeds or the abstract of the title should be handed to the society's solicitors, who, if the title is approved, will prepare the mortgage deed, and on its execution and the receipt of the law charges will pay the amount.

The scale of law charges is £2 12s. 6d. for an advance not exceeding £500; £3 3s. for one between £500 and £1,000; and £1 1s. extra for each £500 or fraction of £500. Persons who wish to erect a house cannot, of course, obtain money upon it until something is in existence. In such cases it is usually possible to arrange for the builder to wait for his money, or the bulk of it, until it can be obtained from the building society. *See* Mortgage.

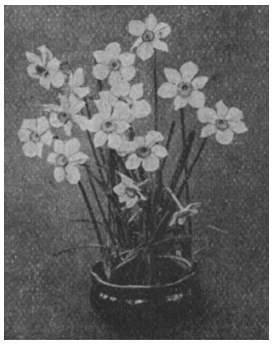
BULB: How to Grow. In the popular sense bulbs include daffodil, hyacinth, narcissus, iris, tulip, crocus, lily, snowdrop, and many others, some of which are not really bulbs, but rhizomes or corms. Bulbs should be heavy in proportion to their size. Soundness may be tested by pressing the thumb on the hollow at the base; this will be firm if the bulb is sound and soft if the bulb is unsound. Reject all soft, spongy bulbs. Flower growth must be preceded by strong, healthy root action, and the cultivator should give it every encouragement.



Bulb. Diagram showing the correct methods of growing bulbs, and some of the common mistakes which are made.



Both size and weight have to be considered in selecting bulbs. Hyacinths are graded and sold at different prices according to grade. A bulb about 2½ in. through in its thickest part is a first size bulb, and will command the best price for the particular variety. Nevertheless, a bulb is often less than 2 in. through and still a first size bulb, as the varieties differ in respect of the size of their bulbs. The bulbs of daffodils, tulips, and lilies vary a good deal in size. If lily bulbs are shrivelled they should be laid in coconut fibre refuse about a fortnight before planting.

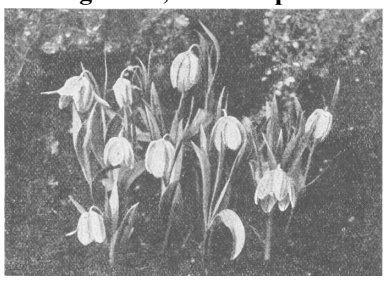




Bulb. Two examples of indoor culture; left, single narcissus; right, white Dutch Roman hyacinth.

There is no better compost than three parts of sound loam, one part of thoroughly decomposed leaf-mould, half part of decayed cow manure, and sufficient coarse sand to ensure the free passage of water. The compost should be thoroughly mixed some time before it is required for potting. It should be moist but not sodden.

If new pots are used, they should be well soaked for several hours, and allowed to dry. Figs. 5 and 6 in the diagram show correct potting, with ample drainage, and the bulbs resting on a base of silver sand. Bulbs should not be planted deeply, as in Fig. 7, or too much above the badly drained soil, pictured in Fig. 8. To drain, place a large piece of broken pot over the drainage hole, smaller pieces over and around it, and still smaller pieces above these, then some of the rougher parts of the compost.



Bulb. Fritillaries grown out of doors.

Bulbs Grown in Water. Bulbs are also grown in glasses of water, rainwater when possible. To keep it pure, a few pieces of charcoal are put into the glass, as shown in the diagram. It is not necessary for the bulb to touch the water; it should rest just above the surface, as in Fig. 1, not in the water as in Fig. 2. Loss of water must be made good from time to time. Bulbs in glasses are best kept in a dark cupboard until they have made considerable root growth, as shown in Figs. 3 and 4 of the diagram. Staking is sometimes essential, and wire supports should be employed.

Some bulbs, more especially the bunch-flowered narcissi, do well in bowls when placed among pebbles and water, but the more customary method for indoor culture is to plant in a mixture of shell and fibre.

The mixture at the start should be fairly damp. A

(*Continued in page 293*)



Duc Van Thol Tulips



Hybrid Varieties of Freesias



Single-flowered Hyacinths



Yellow and Purple Fritillaries

BULBS: FOUR POPULAR VARIETIES FOR GROWING IN THE HOME

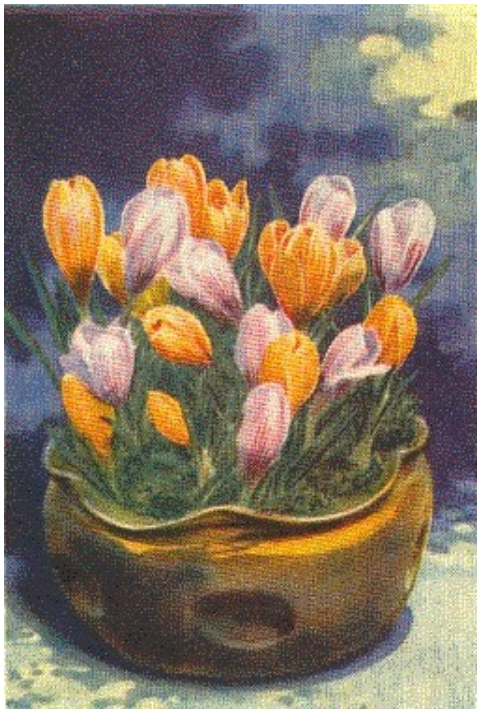
For the culture of bulbs in general see under the heading Bulb. Fuller and more detailed information is given under the individual names: e.g. Tulip , Freesia ,Hyacinh , and Fritillary.



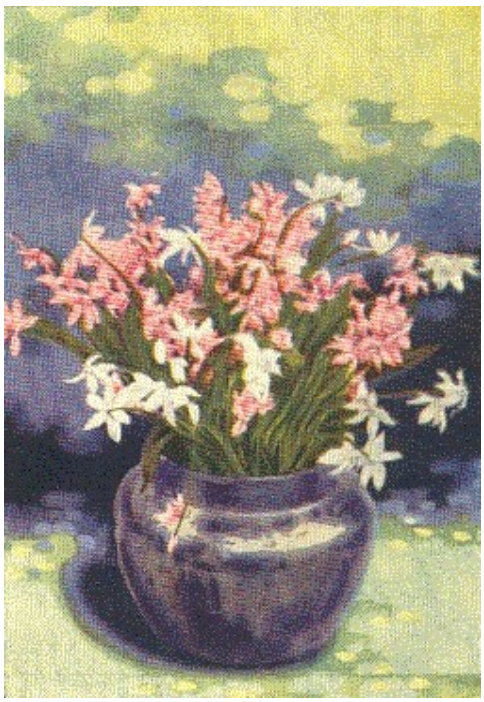
Lord Kitchener Daffodils



Michael Angelo Daffodils



Yellow and striped Crocuses



White and Rose Scillas

BULBS: FOUR OTHER VARIETIES OF DECORATIVE SPRING FLOWERS
Two popular kinds of daffodil are shown above. Directions for their culture may be taken from the general article on Daffodil.

good deal of wetting and turning will be needed to get it to this stage. Such bulbs as hyacinths, tulips, and narcissi should be planted in the bowls so that the crown of the bulb just shows above the mixture. They should be kept in a dark, cool cupboard or cellar for six or eight weeks.

Bulbs for Table Decoration. For table decoration, at a time of year when cut flowers are scarce and dear, relays of bowls should be planted with bulbs from August till December; the earlier plantings ensure a floral display at the close of the year. Bowls filled with flowering bulbs of the dwarf scarlet tulip look attractive on the Christmas dinner-table, while hyacinths brighten the sitting-rooms.

As the flowers themselves form the pattern of the decoration, the plainer the bowls are in design the better, and they should be chosen to harmonise in colour both with the room and the bulbs when in flower. Black Wedgwood bowls enhance the blighter hues, while green lottery, matching the leaves and layer of moss which should hide the crowns of the bulbs, also looks well. Daffodils in shiny brown and pink tulips or hyacinths in greyish-blue stoneware howls are effective in most rooms. *See* Crocus; Daffodil; Hyacinth; Tulip, etc.

BULLACE. Wild plum which grows in English woods and hedges. The small fruit is less bitter than the sloe, and it attains its full flavour only after being frosted. It may be used for fruit tarts, jelly, etc., much in the same way as the purple damson.



Bullace. Prolific branch of this variety of small wild plum.

The yellow-green or black fruit is ripe in October, and is produced in great abundance. The bullace may have the general treatment given to plums. It likes a rather heavy, cool soil. Very little pruning is required. The Langley bullace is the best for gardens. *See* Damson; Plum.

BULLDOG. The big head and wrinkled face of the bulldog are read by some persons as the outward and visible signs of a savage disposition. Yet there is no dog that is safer and that will with a sweeter temper endure all the indignities that may be put upon him by a young child. As a house guard, his methods are his own: instead of warning off an intruder by barking, he prefers to administer punishment silently, and he is not persuaded easily to relax his hold.



Bulldog. Champion of this breed, showing the massive shoulders and widely separated front legs.

In selecting a bulldog, choose one whose body is broad and thick-set, and his head large even in proportion to his body and square-looking—as deep as broad; the thin, small ears set high on the head, the upper part falling to the side. The rough, broad nose should be black, the nostrils large and wide, separated by a sunk line. The thick, muscular neck should be short and arched; the chest broad and deep, keeping the short, straight boned forelegs far apart. The hind legs should be long and less massive; and the round, smooth tail should taper sharply in its short length from a thick base. His gait should be heavy and slouching. The maximum weight for a bulldog is 60 lb.

There is a toy race, known at shows as the miniature bulldog, which is in every respect save size a replica of the ordinary breed, but its weight is limited to 22 lb. The French bulldog is apparently a variety of the smaller breed, but distinguished from it at a glance by its erect ears; those of other bulldogs are always drooping. *See* Dog.

BULLET WOUND. The first-aid treat-ment of gunshot wounds may involve the treatment of haemorrhage, fracture, and shock. It calls for the greatest care to avoid further contamination of the wounds by dirt, thereby increasing the dangers of septic inflammation and tetanus.

Bleeding from the wound may be arrested by pressure as described under bleeding, or in the case of a limb by an improvised tourniquet.

Firm pressure should not be applied on the skull or over broken ribs. Simply apply cloths wrung out of clean, cold water. Such cloths should also be put on a wound of the abdomen, and then a towel pinned round or two broad-fold bandages. Fractures of the limbs should be fixed by padded splints, and of the ribs by broad-fold bandages, before an attempt is made to remove the patient.

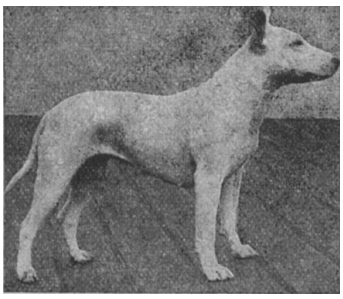
Wounds should be washed by pouring over them cold boracic lotion, if possible, or cold water, and then covered with boracic lint or clean rags. Shock is treated by keeping the patient covered up, chafing the limbs, applying hot bottles, and giving hot drinks of tea or coffee, or, if all blooding from a limb be stopped, a little spirits and water.

In wounds of the trunk care will have to be taken in giving anything to drink at all till the doctor's arrival. A bullet may remain in the body without any bad result whatever, though if it is easily removable it is desirable to take it out. *See* Bandage; Bleeding; First-Aid; Fracture; Tourniquet.

BULL MASTIFF. Although a crossbreed pure and simple the Bull Mastiff has been accepted by the Kennel Club in its classification, and this has enabled the breed to achieve prominence. At one time known as keeper's night dogs, their duty is the protection of person and property. A bull mastiff with its massive frame and stout build is necessarily a formidable foe. The prevail-ing colour is brindle, either light or dark,

but fawn specimens are not uncommon. A dog of this breed should be massive in all proportions —the head heavy, the jaws level, and teeth sound and strong; the neck thick and well rounded, the chest deep, the ribs well sprung, the loins short and strong and the limbs big boned, straight, well carried and well placed in relation to the body. Common faults are cowhocks, splay feet and weak quarters. Careful training is necessary.

BULL TERRIER. The modern examples of the breed have less of the bulldog strain and more of the terrier of their original ancestry.



Bull Terrier, a powerfully built breed of dog.

Except for his black nose and small black eyes, the bull terrier should be wholly white, with a close, short coat of stiff glossy hair. The head is long and flat, wide between the semi-erect ears and tapering to the nose. The jaws are long and powerful, and the nostrils open. The shoulders are muscular and slanting, the chest wide and deep, and the legs straight. The rather short tail tapers from a thick base to a fine point, and is carried without curl horizontally. The bull terrier varies in height at shoulders from 12 in. to 18 in., and in weight from 15 lb. up to 50 lb. *See* Dog.

BUMBLE BEE. The bumble bee performs a useful service in the garden by fertilising flowers, but sometimes it causes injury, particularly to broad beans and antirrhinums. The honey being secreted deep in the blossom, the bee has a difficult task to force its body down to the nectaries. It finds an easier way by puncturing the calyx and petals from outside, and then drawing up the sweetness from within. The result is that pods in embryo are often spoiled by the puncturing and fail to develop properly, with a consequent reduction of crops. *See* Bee.

BUMBLE FOOT. The heavier breeds of poultry are more particularly subject to the disease known as bumble foot. It consists of a swelling in the ball of the foot which, soft at first, gradually hardens and, becoming full of pus, is very painful. The cause is commonly attributed to the fowl jumping to the ground from a high perch, but it is also liable to arise from injury caused by contact with hard substances, such as glass or rough stones.

The symptoms are lameness and a disposition to squat down. To cure it, apply bread or linseed poultices, and then cut and expel the pus, afterwards applying a simple ointment. The foot should be bandaged for a few days, and the bird placed in a pen by itself where it cannot perch but has to rest on straw. *See* Poultry.

BUMBLE PUPPY. This children's game can be played by two or more persons. A pole should be planted firmly in an open piece of ground. The height of the pole varies with the space available, as the taller the pole, the greater the space required, but it should not be much shorter than 10 ft.

From the top of the pole an old tennis-ball in a string or crocheted bag is suspended by a stout cord to about 3 ft. from the ground. The first player must hold the ball out and strike it with a racket, his aim being to wind the cord round the pole before his opponent is able to hit the ball back. When one or the other player be taken. The great rapidity of movement necessary and the quick accord between hand and eye make it an excellent practice for lawn-tennis. The game is also called stick-tennis or spiro-pole.

A game of whist played regardless of rules is given the name of bumble puppy, which is also an alternative name for the old game of nine-holes.

BUN: Plain and Spiced. Of much the same consistency as bread made with yeast, sweetened, and currants or raisins added, for buns the dough is formed into rounds and browned well on top.

Spiced buns are also made with yeast. The following is a good recipe to be used for these or hot-cross buns: Sieve 1 lb. flour, ½ teaspoonful mixed powdered spice, and a good pinch of salt into a warm basin, rubbing into them ¼ lb. of butter. Then make a well in the centre of the paste. Put ¾ oz. compressed yeast into another warm basin with a teaspoonful sugar and beat to a cream. Stir in ½ pint lukewarm milk and 2 well-beaten eggs, and then pour all into the centre of the flour, etc. Mix the whole lightly and beat until smooth; then cover the basin and put it into a warm place so that the dough may rise to twice its original size. This should take about 1 ½ hours.

Clean 3 oz. currants by rubbing them on a sieve with a little flour, and add to the risen dough, together with a little less than ¼ lb. castor sugar. Shape the dough into small buns and place on a greased, floured tin a little distance apart. For hot-cross buns mark a cross on each with the back of a knife. Leave them in a warm place for 10-15 min., when they should be almost double their original size. Then brush over with milk and bake in a hot oven for 10-15 min. *See* Bath Bun; Rock Bun.

BUNG: Of a Barrel. In everyday use, a bung presents three problems: how to get it out, how to replace it, and what to do when it is not tight and allows the contents to leak.

The withdrawal of a tightly fitted bung is almost impossible without damaging it, but a sharp steel spike, curved at one end and handled at the other, will sometimes prove effective. Careful prizing with a screwdriver is occasionally successful, or three corkscrews inserted into the bung, tied together with string and then pulled. When all else fails the bung can be driven through into the interior of the cask.

This necessitates the construction of a substitute Provided a sufficiently large piece of cork is available, fashion it into a bung by cutting the cork with a penknife. Otherwise a circular piece of wood, such as that from the end of an old cornice pole, is easily shaped with a chisel and rasp. To obtain a good fit, try the bung in the hole and give it a twist; this will show up the high spots on the bung, and by cutting these off a good fit ultimately results. A disk of washleather or cloth will be found helpful in securing a tight joint. Bung holes can be enlarged or made with a tool known as a bung borer, but a drill and a cabinet rasp will answer. Steel drums containing oil and wood preservative are much more convenient if patent combined bung and pourer be substituted for the customary cork. A home-made substitute is simply made and consists of a bent tube, about ½ in. diameter and an air inlet pipe about ⅛ in. bore, and curved. Both are inserted into holes drilled in the cork bung. The drum can be sealed by inserting a cork into the mouth of the tube. *See* Barrel; Cork.

BUNGALOW: PLANS AND BUILDING DETAILS

Ten Typical Examples of Attractive Dwellings Described and Illustrated

The reader may usefully turn to Architecture; Bricklaying; Cottage; House; and other articles dealing with constructional matters; as well as to Building; Drawing, etc.

For the purpose of this article the word bungalow is assumed to mean a house with all its rooms on one floor, to be lived in all the year round, and one that in construction and quality of finish will bear comparison with its higher-built neighbours. The bungalow can offer real advantages in reducing running and service expense.

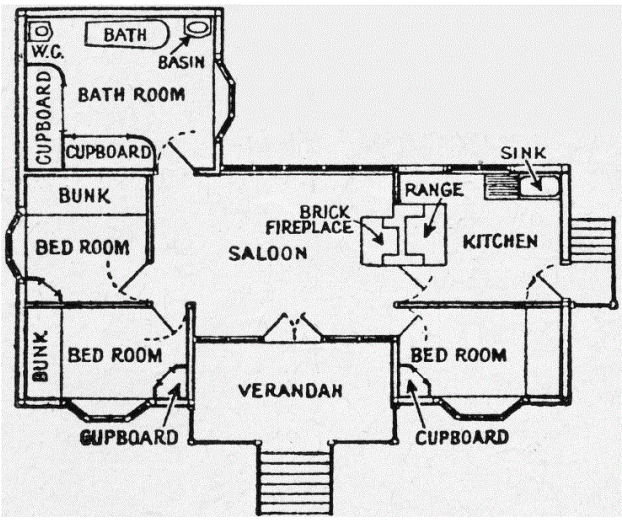
Most bungalows fall into two divisions: those with a central living-room or lounge, with the various rooms, including bedrooms, opening directly from it; and those with a hall or passage from which all the rooms are entered. The drawbacks of the first type are obvious; whether it is worth considering on account of the large gain in cubic contents—that is, cost— is for the occupier to decide. Fig. 1 illustrates the central-room type. This is a compact little riverside bungalow; in winter the many doors incidental to this type become a serious drawback. In Fig. 2, a cosy-looking bungalow of permanent construction, the same type of plan is rather more developed. There is a small vestibule to screen from outside draughts, and a comfortable sitting-room independent of the common living-room.

When we consider the second type of plan, in which the rooms are separated by communicating passages, or hall, we at once come on the great difficulty of the bungalow designer. He must compromise between a long, narrow building, which is economical of roof span but wasteful in passages, and the broader type of plan, compact as regards communication, but lavish in the height and spread of its roof. It is for these reasons that most examples save the smallest assume the L, the U, or the E shape, the additional cost of hips and valleys being compensated for by the lesser roof span and decreased passage space.

The bungalow shown in Fig. 3 tends to the U shape, and has the charm of that most sympathetic of all roofing, reed thatch. The ingenious disposition of the rooms will be noticed in this example since, although it contains four bedrooms, the winding passage is relatively both short and well lighted.

The L-shaped type bungalow is shown in Fig. 4, a well-arranged and well-lighted plan, which is also compact and easy to roof. This example also possesses the excellent arrangement of placing the living rooms en suite, so that two moderate rooms can, on occasion, be thrown into one large one if required.





Bungalow. Fig. 1. Bungalow at Staines, with verandah facing the Thames; below, plan showing arrangement of rooms round a central saloon. (Designed by T. Davison, A.R.I.B.A.)

All these examples, with the possible exception of Fig. 1, illustrate bungalows which are meant for more or less constant residence, and built of permanent materials. They can thus be fairly compared with the average two-storey house, and offer distinct advantages. On the other hand, the week-end bungalow, for merely staying in, is so varied in size, purpose, and construction, that it is impossible to generalise. Being built for a different standard of life, the materials often are poor, and the general level of

finish such as would not be tolerated in an ordinary house. Owing to the absence of a staircase, it is usually easier to give any desired aspect to rooms than in the two-storey house. This concession, however, is modified by the difficulty of grouping bedrooms and, without excessive passage way, keeping their doors away from the entrance hall, a desirable point. Site and aspect usually have greater influence upon the plan in the bungalow than in the house. The most accommodating site is one with access from the north or north-east, which gives service quarters, etc., on the colder entrance side, with the living quarters to the south or southwest, overlooking the gardens and catching the maximum of sunshine.

Whether bedrooms should face east or not is a matter of personal choice. A small point that is often overlooked is the value of some suggestion of plinth or base, lest our bungalow tend to look like the top portion of a house half sunk in the ground. For the same reason the utmost should be made of any little difference in level, terrace, or steps.

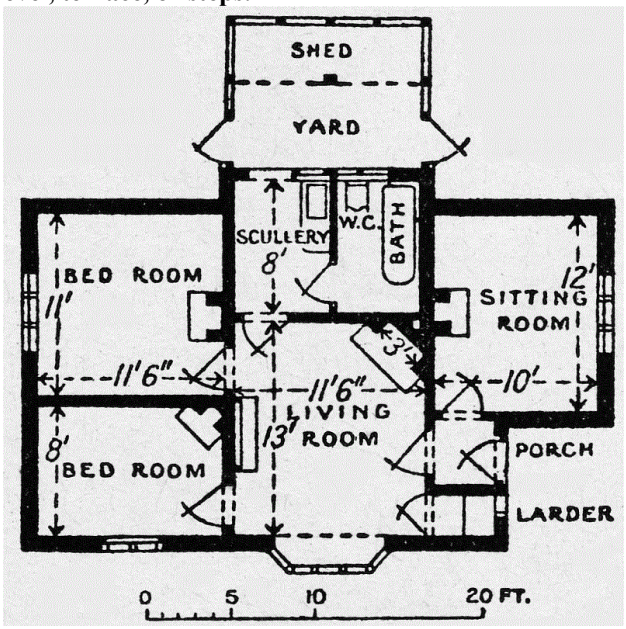




Fig. 2. Bungalow at Renshurst, Kent, built of brick, roughcast, with tiled roof and genuine half-timber work in the gable. Above, plan. (Designed by T. Millwood Wilson)

The roof will usually be spreading and low in pitch, if only for the sake of economy, and this, if well proportioned, combined with broad eaves, will do much to give a restful effect as well as a useful shadow. Chimneys, in the nature of things more numerous in the bungalow, should be grouped and arranged when possible to sit squarely on a ridge, or at least should bear some definite relation to the roofing scheme rather than protrude apparently at random, as is so often seen. Scale should be carefully considered, and accessories such as railings, porches, trellis work, etc., are most useful in preserving this. The usual fault is to make them too clumsy and lacking in elegance. If the roof is of thatch it is better to form the gutters and downpipes of wood in the old manner.

Brick the Best Material

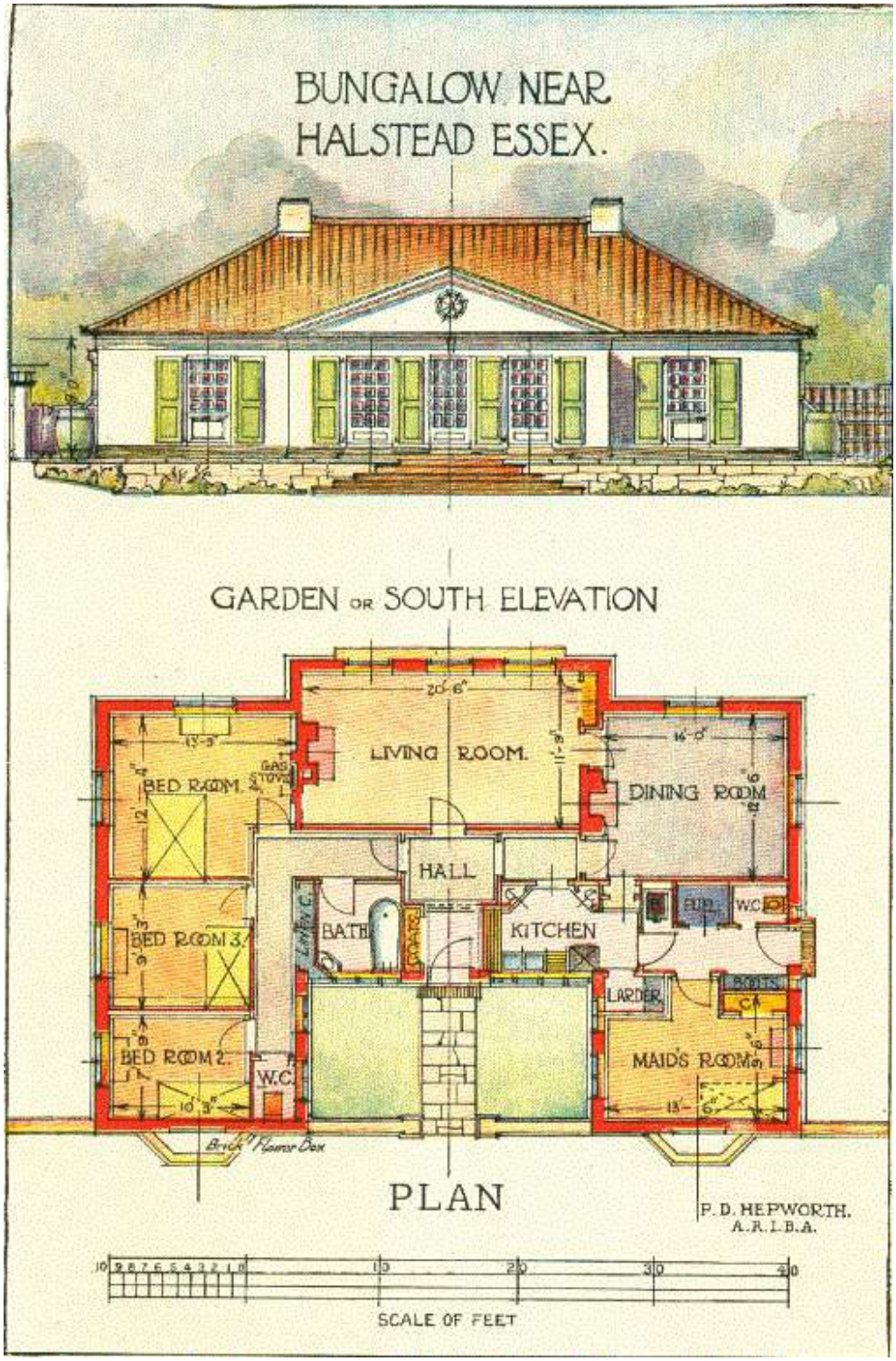
The most general and, other things being equal, most usually satisfactory material for the walls is brick. Whether this is finished with facing bricks good enough as regards texture and surface to be left, or whether cheaper bricks are to be used, and the outside to be finished with plaster or lime washed, depends upon the materials obtainable and restrictions of cost. In any case, unless roughcast or plaster is to be applied outside, the walling of the building in order to ensure weather-proofness, should be hollow.

An economy that is perfectly satisfactory in one storey buildings is two walls of brick on edge with the through headers acting as bonders, or ties. This requires an external covering of plaster, etc., but effects a saving in bricks, and is amply strong enough to support the small weights of a bungalow.

Many efforts have been made to popularise wood construction in England. It is worth noting, however, that in America, one of the great homes of building in wood, there has been a growing tendency to revert to brick construction. Wood construction usually implies a solid braced framework of wood, covered externally with overlapping boarding, the inside walls being plastered or covered with a substitute, such as asbestos sheeting, match, or pressed fibre boarding. The main advantage of the wood house is the speed with which it can be erected compared to other forms of construction. In general, too, its initial cost is less, though a well-constructed wood house is by no means much cheaper than a brick one, especially if solid floors and substantial foundations are employed. Its disadvantages are obvious—shorter life and greater upkeep; in fact, before building a wood house its yearly cost of upkeep and repairs should be ascertained and capitalised and added to the initial cost.

Pisé-de-terre, that is, walls of earth rammed between shuttering until homogeneous, is a very old method of building. On account of its inherent weakness it is unsuited for lofty walls, and therefore more particularly applicable to the bungalow type. It also needs to be made of considerable thickness, this latter failing being its greatest charm. Like the wood building, however, it requires ordinary brick foundations and chimneys, and some form of surface protection. Fig. 3 shows a bungalow of this material, in which the pleasing effect of the softened corners will be noticed. As, however, many soils are unsuitable for this method, the prospective builder will do well to

(*Continued in page 299)*

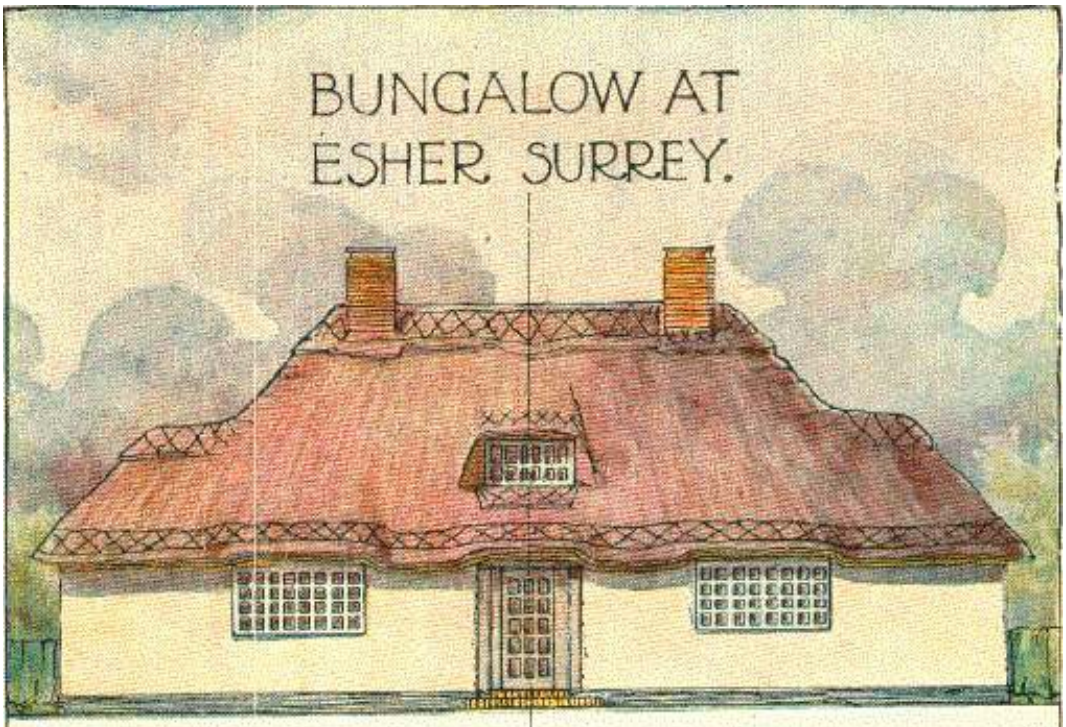


BUNGALOW: ARCHITECT'S WORKING PLANS, ELEVATIONS AND PERSPECTIVE SKETCHES FOR TWO EXAMPLES OF THIS LABOUR-SAVING ONE-STOREY TYPE OF PERMANENT HOME

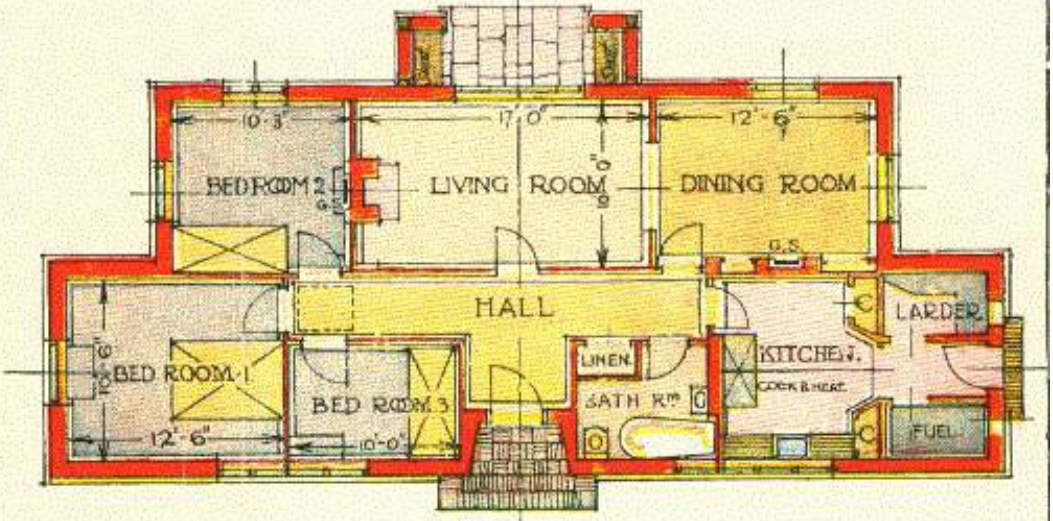
These two dwellings are excellent examples of Bungalows which are genuine homes meant for constant residence and built of permanent materials. They demonstrate methods of planning and construction by which the disadvantages of the week-end type of bunglow are successfully overcome, while maintaining all the advantages of construction of the one-storey home. The design above is of a bunglow at Halstead and is of U-shape, with the service rooms on the north side round a diminutive courtyard, a service hatch and sliding door giving communication between the kitchen and dining room. The bedrooms are well separated from the living portion of the house without being cut off by space-wasting passages. This represents a developed form of the U-shape illustrated in Fig. 3, page 299, which provides about the same accommodation.

(*From Plans and drawings specially prepared by P.D. Hepworth, A.R.I.B.A.)*

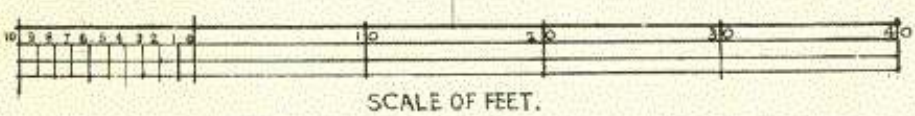
BUNGALOW AT ESHER. SURREY.



NORTH OR FRONT ELEVATION.



PLAN



SCALE OF FEET.

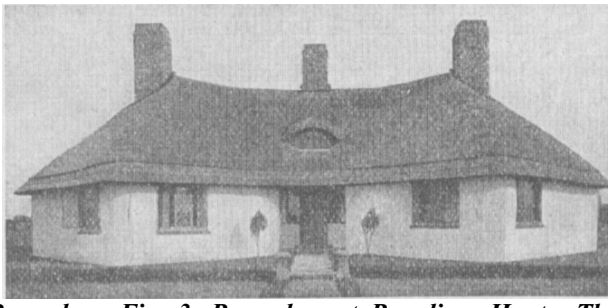


Bungalows at Esher from garden (above) and at Halstead, from road (below)



BUNGALOW: ARCHITECT'S WORKING PLANS

obtain expert advice before deciding on his site.



Bungalow. Fig. 3. Bungalow at Beaulieu, Hants. The walls are made of pisé-de-terre.

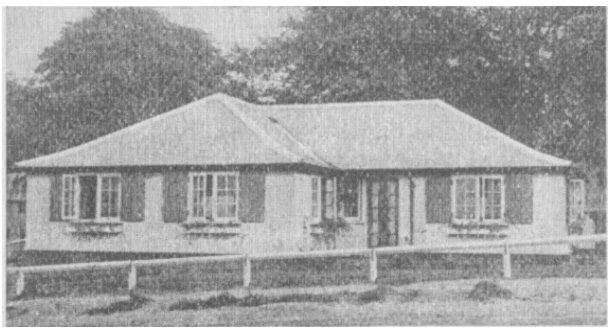


Fig. 4. Bungalow in Nottingham, without chimneys, as heating is by gas. It is of stucco-faced brick blocks. Above, plan. (Designed by D. Howitt, A.R.I.B.A.)

Use of Concrete for Walls

Concrete forms a fourth method of wall construction. This may be either cast in shuttering on the job, or the wall built of previously cast blocks. Systems are innu-merable. Probably one of those using cast blocks with two or more cavities in their thickness will make the best wall. In general, concrete for domestic building is not now widely used. For inside walling, however, the thin wall of "breeze" concrete blocks has almost entirely superseded the division of plastered studding.

Assuming a raft of concrete over the site, the floors may be either hollow or solid. In the first case the board is laid on wood joists, on dwarf brick walls, a short distance above the surface concrete, having—what should be, but often is not— a well-ventilated space below. The alternative is to lay the floor boards solid on the concrete in mastic, on the principle of a wood block floor. This method has been rapidly gaining in favour of late years, owing to its convenience and greater safety from dry rot.

Setting aside such materials for the roof as asbestos compounds and corrugated iron, there remain slates, thatch, or tiles, which may be either flat, as in Fig. 2, or the pantiles. If slates are or used, an endeavour should be made to obtain one of the thicker varieties and to vary the colour. They usually look best over a whitewashed wall. If a sawn stone ridge is not used, the ordinary half-round ridge tiles, alternately tarred and whitewashed, make a good substitute.

Windows may be of casement form, either wood or steel, or the familiar boxed sash window. There is little difference in the cost between them, what there is being rather in favour of the casement. If casement windows are used with shutters, these should open inwards, a fact which must be remembered when designing inside curtains.

Internal arrangements on different principles are indicated in the plans accompanying Figs. 1-4 and A to F. Detailed arrangements common to house and bungalow are discussed under the heading Architecture.

Bungalows are naturally harder to heat than houses, and if a central heating system is used, special attention should be paid to securing sufficient fall to the pipes. Moreover, bungalow chimneys, on account of their lesser height, are rather more susceptible to down draughts, and trees or buildings adjacent must be considered. There will usually be found ample room for storage purposes in the roof. Rough boarded and provided with a generous-sized trapdoor, it becomes a useful box-room, etc.

Comparison with a Small House

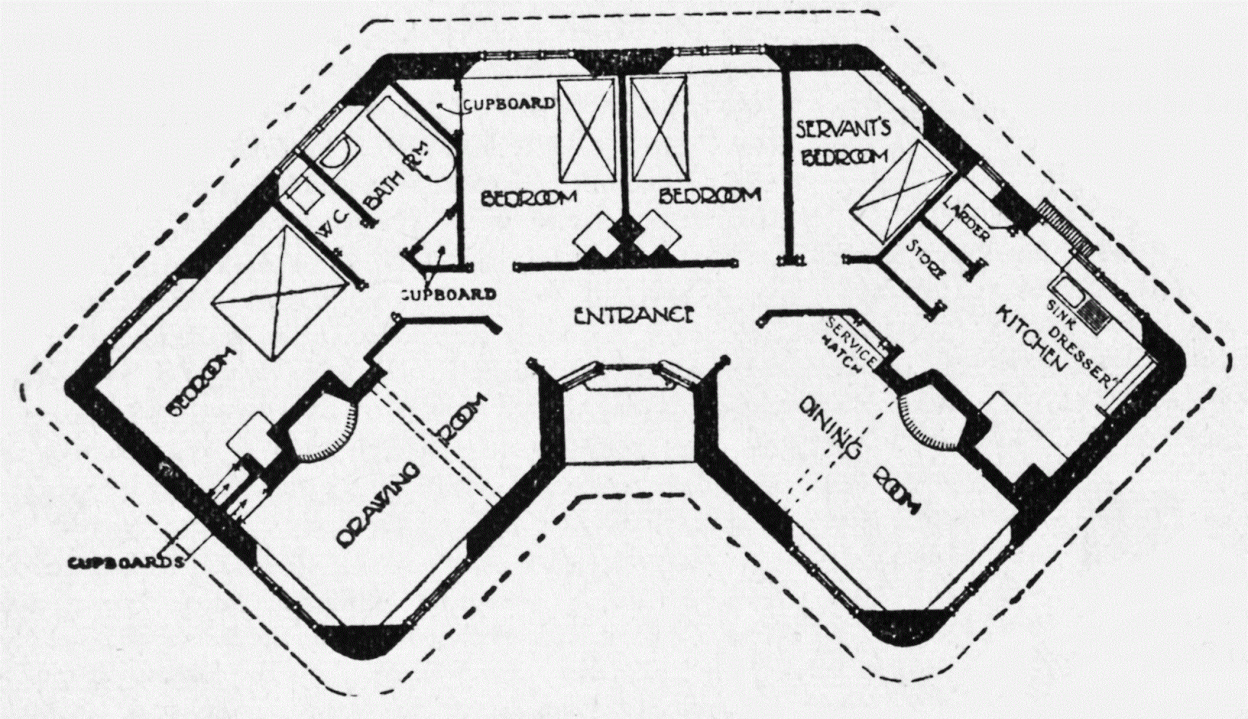
It is interesting to consider the relative merits and cost of a bungalow and a two-storey house. The average idea is that it is much cheaper to obtain the same accommodation in bungalow form, that passages are eliminated along with staircase, and that by having one storey half the brickwork is saved. Such conclusions cannot be said to be justified. As to actual saving, the omission of stairs, upper flooring, joists, etc., is obviously in its favour, but the area of ground flooring is practically doubled. As regards walling, the gain is small, since the lower height is usually more than offset by the greater perimeter. Chimney stacks, too, though less in height, tend to be more numerous and less easy to group. Damp course foundations tell heavily against the bungalow, as also does increased roof area, with its consequent greater length of gutter and ridge. On the other hand, there is greater speed in erection, and certain advantages, such as decreased scaffolding and easier supervision. Many of these points do not apply to the very small and simple bun-galow, which may, even in initial cost, prove the cheaper. Above a certain size, however, the one-storey type tends to overtake and pass the house, though many will think the relatively small increase in first cost more than justified by its inherent advantages.

A careful analysis made by Mr. Edwin Gunn, F.R.I.B.A., concerning the approximate cost of a bungalow and a two-storey cottage of almost identical accommodation gave a working result of 9 per cent, extra to the former in initial cost. This granted, however, the advantage of having all the rooms on one floor is undoubtedly great and is increasing with the steady development of mechanical devices.

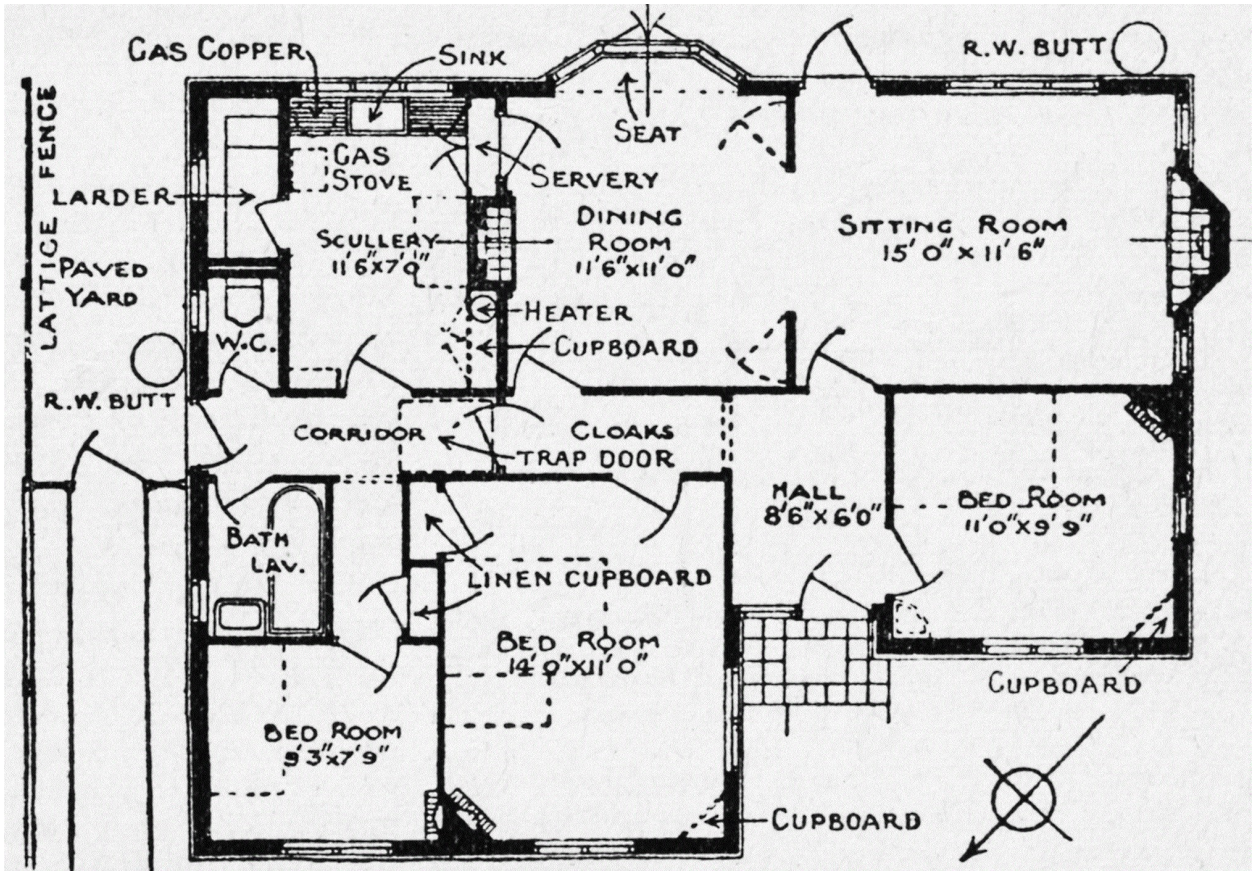
BUNION: How to Treat.

A bunion is a swelling over the joints of the foot; it is usually found on the first joint of the great toe. It occurs with displacement of this toe towards the other

(Continued in page 303)

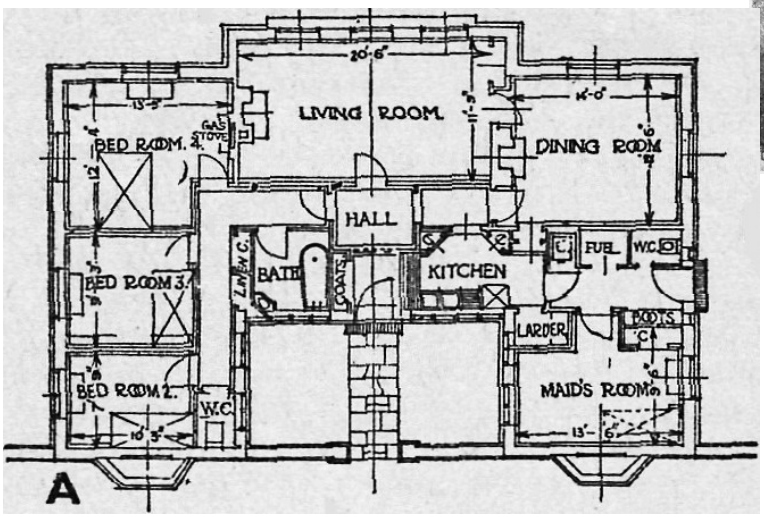


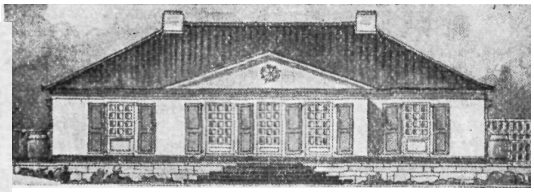
Bungalow. **U-shaped plan, Fig. 3, page 299.**
(Designed by Leonard Martin, F.R.I.B.A.)



Plan of bungalow in Nottingham, Fig. 4, page 299.
(Designed by D. Howitt, A.R.I.B.A.)

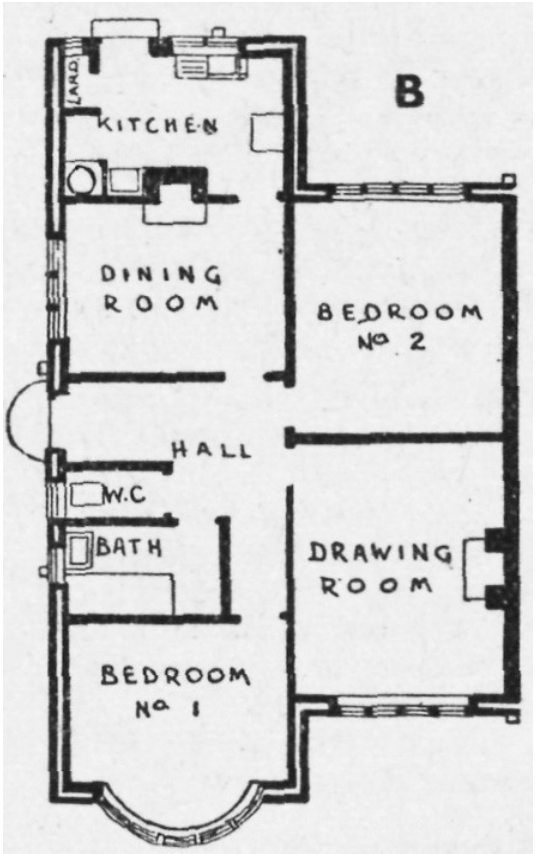
These examples are supplementary to those given in pages 295 and 299 where the general principles of bungalow construction are discussed.

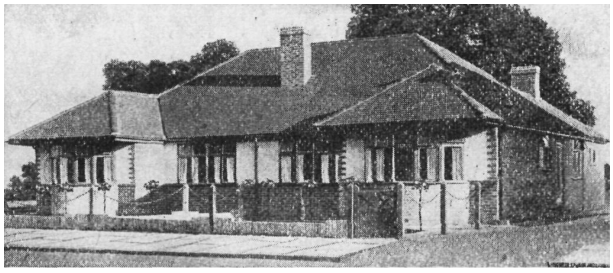


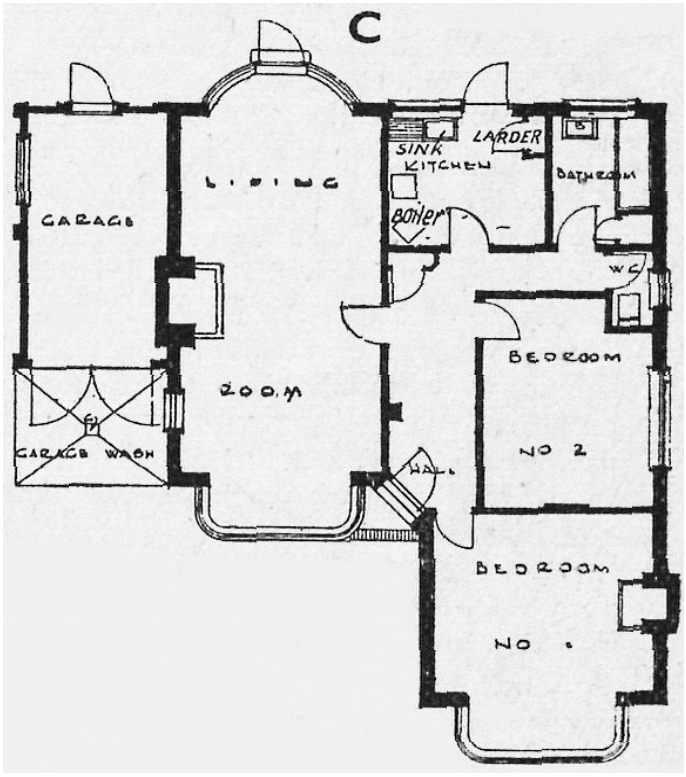


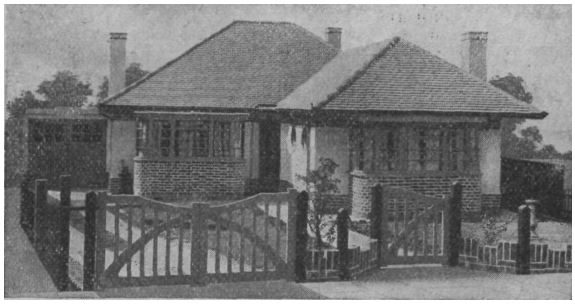
Above, garden front elevation. (P.D. Hepworth, A.R.I.B.A.) Left, (A), plan of U-shaped 4-bedroomed bungalow with service rooms on North.

(B) Plan and Elevation of 5-roomed bungalow costing about £725 in London.



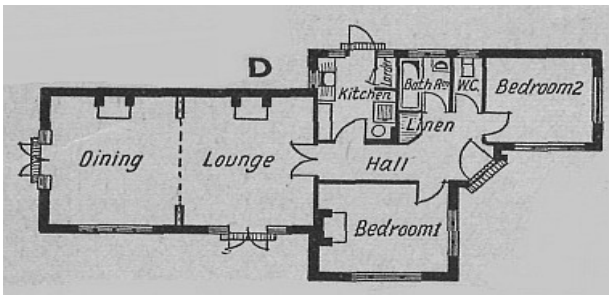


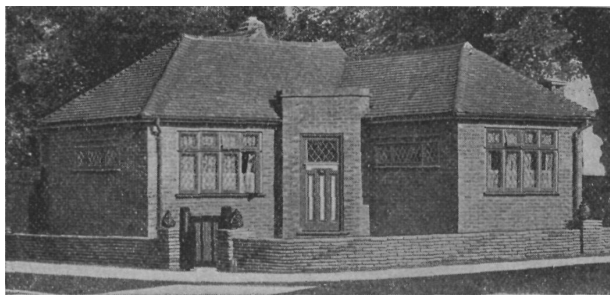




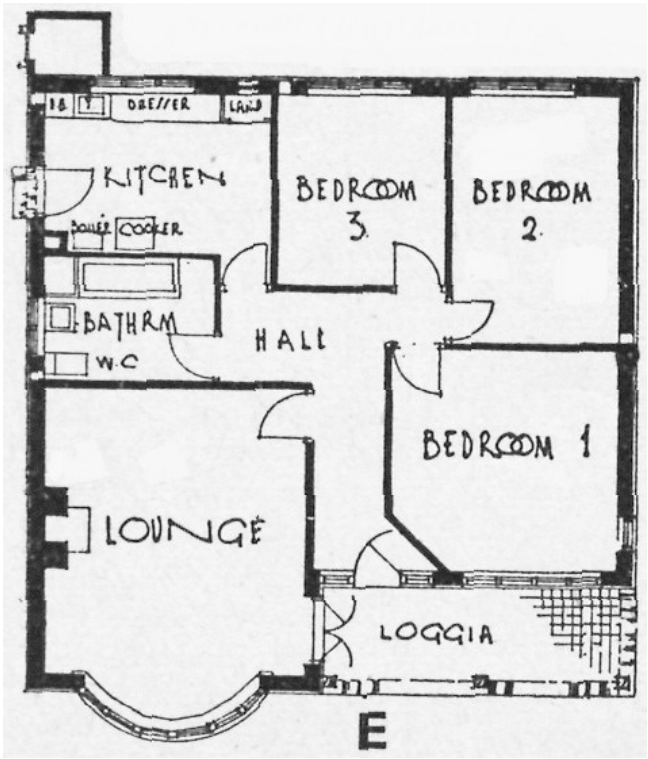
(C) Photo and plan showing large living room, garage and two bedrooms; brick rendered "Snowcrete"; cost, detached, about £900. (Taylor Woodrow Ltd., and Barr & Mead, Ltd. Agents for Bungalows B and C.)

These examples are supplementary to those given in pages 295 and 299 where the general principles of bungalow construction are discussed.



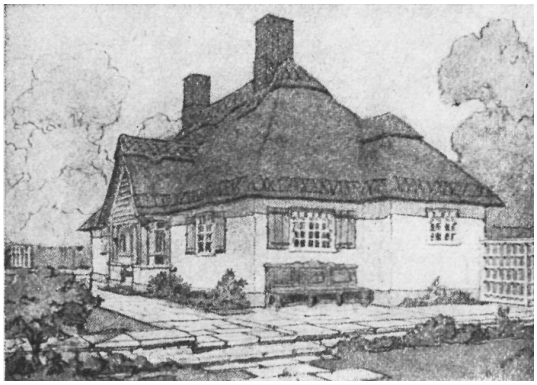


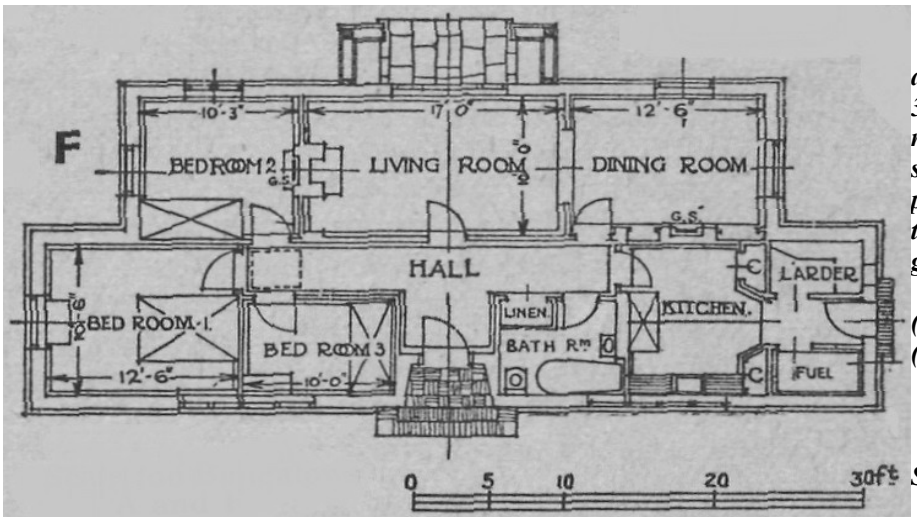
(D) Well designed bungalow in brick. Note high porch in angle and absence of corridors. Cost about £605.





(E)
Left and above. Bungalow with 3 good bedrooms, large lounge, 18 ft. by 14 ft., and glass roofed loggia; cost about £850.





(F) Left and above. Attractive design on long shaped plan with 3 bedrooms, living and dining rooms and service rooms well separated without wasteful passages. Thatched roof can be tiled. Perspective sketch from garden , above.

(E): New Ideal Homesteads Ltd.; (F): P.D. Hepworth, A.R.I.B.A.

Scale for Bungalows A and F.

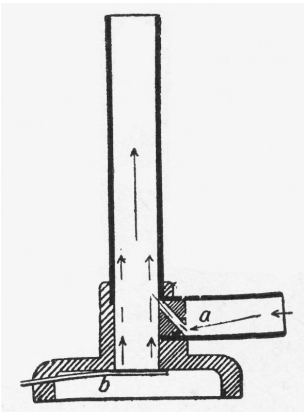
toes by pressure of tight, badly shaped boots, or in cases of osteoarthritis. The resulting irritation causes thickening of the skin.

The first step towards a cure is the provision of a properly shaped boot, that is to say, straight on the inside. It may be necessary to have a boot specially made so that there is no pressure on the inflamed part. If the deformity is at all pronounced, a metal splint may have to be worn.

If inflammation occurs, tincture of iodine may be painted on, one or two coats nightly for three or four nights; but if there is suppuration, a doctor will have to let the matter out. *See* Corn; Foot.

BUNSEN BURNER. Universally used in laboratories and workshops, the Bunsen burner may be called the foundation design of all gas cookers and domestic gas fires. The principle of the burner is to utilise the velocity of a jet of inflammable gas or vapour issuing from a tube under some pressure to draw into the gas currents of air and to mix the air with the gas before it is ignited. There results a flame which may have very little illuminating power but is intensely hot.

A common modern form is shown in the diagram. The gas inlet is the inclined passage *a ;* air is admitted at the bottom, the amount being regulated by the adjustable disk, *b. See* Gas.



Bunsen Burner. Diagram of a common type.

BUNTING. This material, a somewhat coarse, open-textured worsted, is generally woven in rather narrow widths and dyed in brilliant colours, being cut and sewn to make flags. It is rarely used for any other purpose except stand or stall decoration for a garden sale of work or flower show.

Buphthalmum. Name of the hardy perennial popularly known as ox-eye (q.v.).

BUREAUX: ANTIQUE AND MODERN

Practical Hints for Collectors and Handicraftsmen

Other articles of similar nature are Cabinet; Chair; Chest; Sideboard. See also Chippendale; Inlaying; Joint; Sheraton; Walnut, etc.

There are only a few bureaux of earlier date than the reign of Queen Anne in existence, these being chiefly specimens from Cromwellian times. Walnut bureaux are a familiar feature of Queen Anne furniture. They usually had a glazed case or a cabinet of drawers above, were fitted with a sloping lid, and surmounted by pediments of various kinds, which never entirely went out of fashion right through the 18th century.

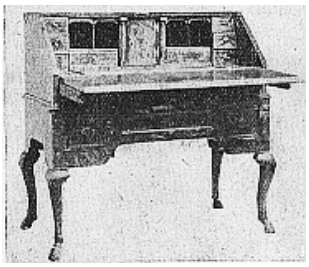
Bureaux were made by Chippendale and Hepplewhite. The former made many that had above a bookcase enclosed by two doors, or a china cabinet. Above the cornice the broken pediment is found, and sometimes in the centre a crown and feathers. The inside fittings followed the Queen Anne models as regards their arrangement, but with carved decoration or lacquer work. An oak bureau should cost less than one of walnut or mahogany, because the two last-named woods were used for finer pieces. Mahogany bureaux over 150 years old are rare.

Secret drawers were often concealed in the complicated interiors of bureaux. A place where one may be looked for is on either side of the central pigeon-hole, where a little decorative column is sometimes placed. That column hides the drawer, discovered by putting the hand through the central pigeon-hole to the back and feeling there for a secret spring which releases the column, which then comes away with a narrow drawer behind it. Another drawer —a very simple device—may be placed at the back of two little brackets which are sometimes found to right and left of a central recess underneath the row of pigeon holes. These small brackets simply come out as drawers.

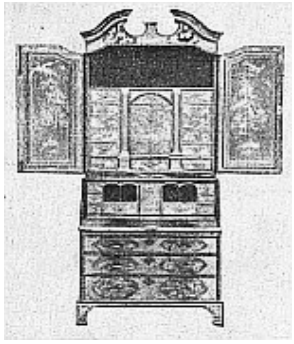
Antique Patterns. The illustrations on this page show fine examples of bureaux. No. 1 is a somewhat unusual example. Made of walnut towards 1700, it stands on cabriole legs with hoofed feet. The top is fitted with eight small drawers, four pigeon-holes and in the centre a cupboard. The pillars on either side of the cupboard should be noticed, as they form the backs of two secret slots, intended for hiding papers.

No. 2 is typical of the Chippendale period to which it belongs. The fine lacquer work ornamentation showing Chinese inspiration and influence and also the broken line of the pediment should be noted.

No. 3, of walnut, has interior fittings not unlike those of No. 1; but the four long drawers in the body of the piece suggest a more practical design, which has been very considerably imitated since.



Bureau: antique examples. Left 1. Walnut bureau on cabriole legs and hoof feet, late 17th century.



Right 2. Piece of the Chippendale period ornamented with lacquer work.



Right fig. 3. Walnut bureau with shaped interior fittings. (1 and 3, courtesy of Gill & Reigate, Ltd.; 2. Victoria and Albert Museum, S. Kensington)

Apart from its decorative effect, a bureau takes up less room than a writing-table, has deeper drawer space, and affords an opportunity of quickly enclosing a considerable amount of correspondence.

Making a Bureau. For the bureau shown on the next page, Fig. 5, mahogany stained to a rich plum colour, and either bright or dull polished, is successful, while waxed walnut has always a refined appearance. Oak, stained and polished to a Jacobean or nut-brown colour, will leave little to be desired for Fig. 3, and birch, beech, and basswood are efficient substitutes for a cheaper article, all these three taking stain well.

For a medium-sized article the apportioned width may be 2 ft. 6 in., whilst a small size may be put at 2 ft. wide. The height to table top is 2 ft. 6 in. and the enclosed slope rises from 10 in, to 12 in. above this. The depth back to front is 1 ft. 5 in. over the side. Two different styles of bureau are pictured, and taking the oak or Jacobean (Fig. 3) it will be seen that the main construction consists of two parts. The case encloses drawers and pigeon-holes, being separate from the base support, which is in the form of a stool, with recessed top into which the case drops. A front elevation of this bureau is given at Fig. 1, showing fairly deep drawer accommodation in the general dimensions marked, the width being 2 ft. 6 in. The depth of 1 ft. 5 in. marked on the side elevation allows for ample service. If shallower drawers are desired, the stool could be increased in height by a couple of inches or so with good proportions. A sketch of parts which will be handy for reference is seen in Fig. 4, which shows clearly the chief joints and fittings.

The sides (A) are of ¾ in. thick hardwood, or ⅞ in. thick if faced. The front edge is vertical for 1 ft. 4 in., and then is cut back to a point 9½ in. from the back edge, to which it finises at right angles and at a height of 2 ft. 3 in. This 9½ in. takes the top shelf, which should be of equal thickness with the sides.

The inner shelf or table top (C), in line with which the fall will open out, is best dovetail-grooved into position, but could be tenoned or dowelled to sides. It is shown as of equal width with the sides, but could be of 11 in. width only, so that, when fitted, it projects 1 in. under the stationery box (inserted later), and gives a bearing. The joint into sides is stopped ½ in. from the front edge of the sides, and the part pushed home.

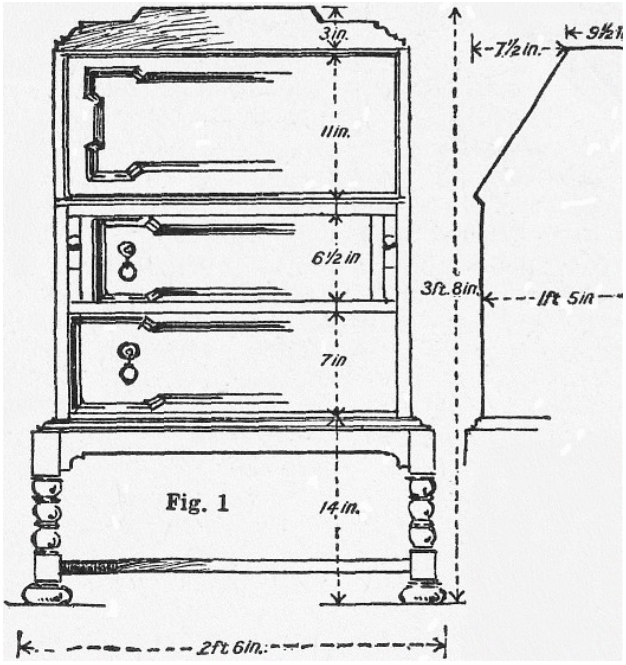
The bearer rail (D, Fig. 4) is 2½ in. to 3 in. wide, by ¾ in. thick, and enters into the sides with a couple of tenons. A couple of similar rails can be dove-tailed in at E, one at front and one at back, instead of the full width bottom of the case.

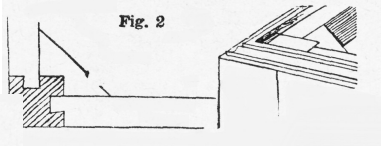
The runners (F) are tongued to the rails in addition to being grooved to the sides, and are a clean-up from stuff 3 in. wide. They should also be grooved as well as the inner edge of rails to receive dust-boards(G), which are desirable to limit the drift of dust in course of service.

A check or short inner upright (K) is fitted ¾ in. away from case sides on each side of the upper drawer, entering with a couple of tenons top and bottom; the resulting ¾ in. space between serves for the slide (J) to travel in.

The slide supports the fall when down. It is made 3 in. wide, and mounted on a block (H) to make up the balance of height with the top drawer. The slide can be eased from ¾ in. thickness, and should travel smoothly without play.

The drawer fronts (L, M) are shown in Fig. 3 as broken in design, but can be mitred up in the plainer manner indicated at Figs. 4 and 5 with neat effect. The section is ¼ in. thick by ¾ in. wide, and is obtainable in 10-ft. lengths ready for gluing and pinning as required. The drawer sides are ⅜ in. thick, backs ⅜ in., and bottoms ¼ in., all dovetailed together in the usual manner. Handles of the pear-drop variety, with bolt and nut fastening, are preferable for the Jacobean design (Fig. 1).







Bureau. Figs. 1-3. Jacobean bureau and details for making it.

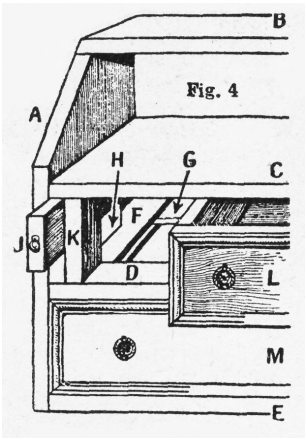


Fig. 4

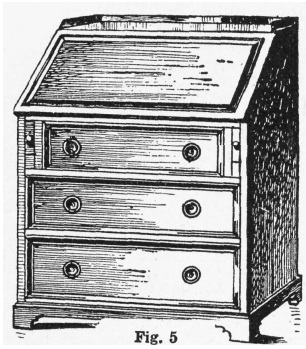


Fig. 5

Figs. 4-5. Design for Georgian bureau with three drawers.

The back can be of ⅜ in. or ¼ in. thickness, matched or plain, and may be rebated in or screwed on. The grain should run horizontally.

The fall or flap (as Fig. 3) can be framed up of ½ in. thickness, with a panel ¼ in. net clamped each end and screwed behind. A ¾ in. by ¼ in. section mould is mitred up to drop in on face. Alternatively the fall can be framed up of ¾ in. thickness with ½ in. panel grooved in, and the recess moulded on the solid. It will be rebated to lap partly over the edges of the sides and top shelf.

The stationery case is practically a separate box for insertion, and optional in its arrangement of pigeon-holes and drawers, etc. The surround can be of ⅜ in. thickness, dovetailed or nailed together, and the divisions of ¼ in. or ⅛ in. in thickness, V-grooved into position.

The stool base (Fig. 1) has 1 ¾ by 1 ¾ in. net legs, with the top rails dovetailed in as Fig. 2, and braced in the angles. The recess into which the upper casing (Fig. 4) drops is formed by a mitred mould on three sides, as in Fig. 2. Ball or mock twist turning is indicated, and blocks are provided for the underframing rails at sides and back to be tenoned in.

The foregoing details apply to the alternative design, Fig. 5, in a general way. A ledge on three sides is provided in place of the shaped back rail of Fig. 3, and the fall can be of ½ in. thickness, mitre clamped each end, and with a ¼ in. applied panel on face as an alternative to the grooved-in panel, which should finish flush on the inner side when lined with leather or cloth for writing. Being more in the Georgian style, circular handles of the rosette pattern are most suitable.

BURGLARY: Alarms for the Home. An alarm should be worked automatically by the entrance of the intruder, and so wake the inmates. The best system is electrical. It depends on the operation of a contact by opening or shutting a door or window.

Fig. 1 shows the door or window contact consisting of an arm carrying two contact plates normally separated from each other; these are forced together by means of a pawl whenever a door opens beneath it. The device is fixed to the architrave over the door. Window contacts are made on the same principle (Figs. 2 and 3).

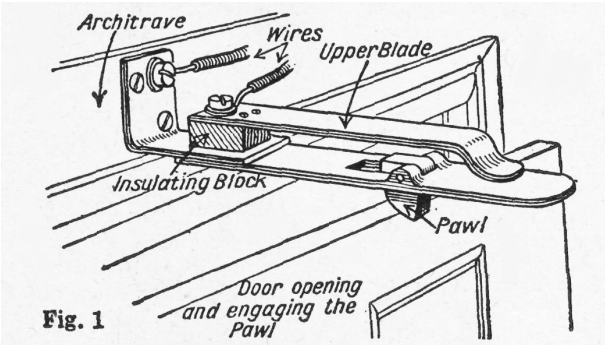


Fig. 1

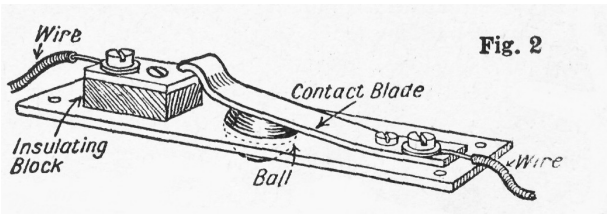


Fig. 2

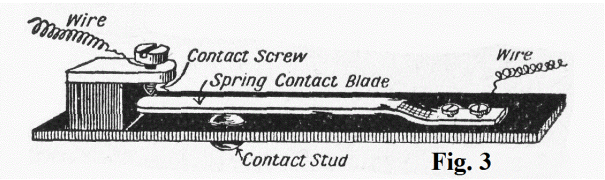


Fig. 3

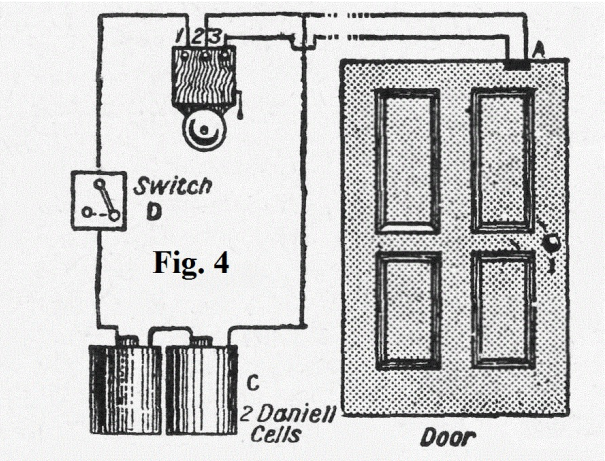


Fig. 4

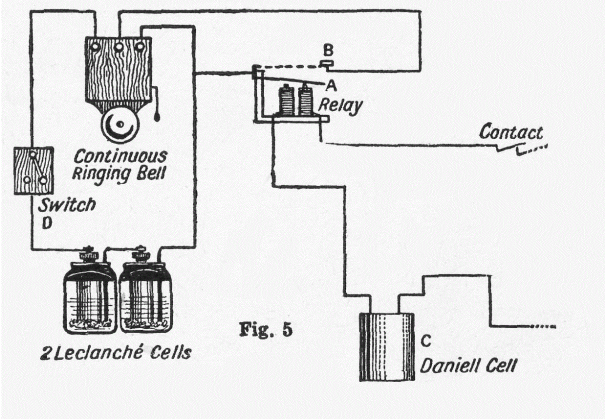


Fig. 5

Burglar Alarm. Appliances and circuits that betray opened windows or doors (see text).

In the closed circuit alarm system the essential feature is that when in action the circuit is closed, a current of electricity flowing constantly along the wires and through the alarm contacts. The moment this circuit is opened, as by the opening of a window or door, or by cutting the wires, the alarm bell rings.

The wiring diagram, Fig. 5, illustrates a typical alarm circuit; but as many contacts as needed will be wired on the same principle.

Fig. 4 shows a single door contact at A, with a bell of the ordinary vibrating type, with the addition of a third terminal, this being in connexion with the contact post. A battery of Daniell cells is shown at C, and a switch at D, as a cut-out for use when the alarm is not needed. When this switch, D, is closed, current flows from the battery through the switch to terminal 1 on the bell, thence through the magnet coils to terminal 3, through the contact A, and back to the battery. This energises the bell's magnets, and attracts the armature, pulling it out of contact with the contact post, and maintaining it in this position until the circuit is broken, as by the opening of the door. When this happens the bell will continue to ring until the door is again closed.

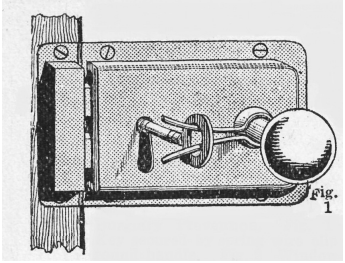
This system suffers from the defect that if the door is again closed, or the severed wires reunited, the bell will cease to ring. For this reason a relay can be introduced with advantage, as it can be used, as shown in Fig. 5, to close a local circuit to a continuous ringing bell. The bell can only be stopped ringing by opening the switch D and resetting the catch on the bell.

The ideal protection is obtained by combining both systems, fixing open and closed contacts at every point to be protected.

The battery for any closed circuit system has to be of a suitable type, as the current is flowing constantly. The battery that is in most extensive use for this work is the Daniell (q.v.). Others are the Edison-Lalande, the Fuller and the Bunsen.

Burglary Insurance. Burglary is robbery from a dwelling-house by night. Night means between 9 p.m. and 6 a.m. of the next day. Housebreaking is a robbery from a dwelling-house between 6 a.m. and 9 p.m. Both offences connote a breaking-in or a breaking-out. If a thief finds a door or window open, and gets in that way, he is not a burglar or housebreaker, but if he steals anything, he has committed larceny from a dwelling-house. A householder ought to get a policy covering him against these risks. *See* Insurance.

Burglary Prevention. Adequate protection is often provided by building in strong iron bars for bathroom, larder and frequently kitchen windows.



Burglary Prevention. Fig. 1 Key secured by spring wire clip round handle.

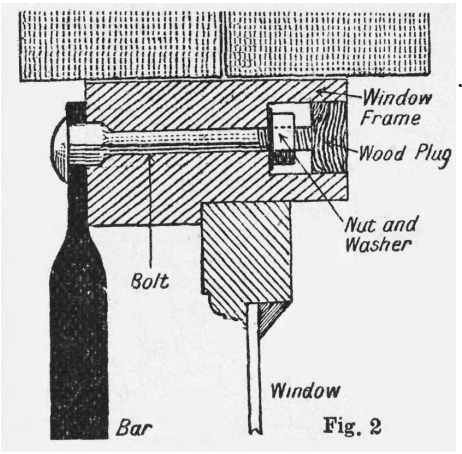


Fig. 2. Window bar fixed with coach-bolts.

Fix them to woodwork with coach-bolts (not screws) the nuts being covered with plugs (Fig. 2). Casement windows can have the protecting bars crooked or bent outwards to allow the window to open. *See* Bolt, Lock, Alarm, etc.

BURGUNDY. Burgundy is a wine from the Haute- Bourgogne, Basse-Bourgogne, Maconnais and Beaujolais, in France. Fuller in body and of greater alcoholic strength than claret, it possesses a fine, clear, dark-red colour and charming bouquet.

Many fine wines come from Pommard, Volnay, Savigny and from Beaune in the Côte-d'Or. The last-named is perhaps the best known amongst the cheaper Burgundies. A true Burgundy can always be known by its clear dark red colour and bouquet.

Burgundy matures quickly, and a wine of 10 to 12 years old is in its prime. It should be slightly warmed before drinking.

BURGUNDY MIXTURE. A useful spray for potatoes to prevent summer blight, is named Burgundy mixture. To make a 1 p.c. solution put 1 lb. copper sulphate in a wooden tub containing 8 gal. of water and allow it to stand a few hours. When dissolved, put 1¼ lb. soda in ½ gal. hot water and when dissolved cool down with 1½ gal. cold water. Pour the 2 gal. of soda solution slowly into the large tub. Its method of application is identical with that of Bordeaux mixture. *See* Bordeaux Mixture; Potato.

BURN: How to Treat. Injury caused by dry heat or flame is called a burn; a scald is the result of moist heat. There are various degrees of burning. It may cause simple redness or greater redness and blistering, but leaves no scar on healing (first degree).

Destruction of all the layers of the skin may be caused along with the nerve endings, so that there is less pain, but a deep and permanent scar remains (second degree). If the tissues underlying the skin are destroyed the result is deep scarring with deformity (third degree). Charring of the bone may also occur. The immediate effects are the pain and some degree of shock.

The doctor should be summoned at once if the burn is at all severe, or if shock is present.

Pending his arrival shock should be treated by putting the patient to bed, with hot-water bottles at his

legs and by his sides, and giving him hot drinks—tea or coffee, or a little diluted spirits, or a teaspoonful of sal volatile in a wineglass of water. The patient should be kept perfectly quiet and free from worry.

Children may very carefully be put in a warm bath; this will lessen the shock and facilitate the removal of the clothing from the burnt part. If any burnt clothing adheres, it should be soaked thoroughly, and if it does not come away easily it should be cut round.

With regard to first-aid dressing, there are various suitable remedies; the one chosen will depend upon what is handy. Greasy applications should not be used except for slight burns as they are usually difficult to remove. If blisters are small they should be left, but if large they should be pricked with a clean needle or scissor point. A good method of dealing with them is to thread a needle with white cotton and to boil these for a quarter of an hour in a clean pan. The needle is passed through the blister from end to end, and the cotton cut, leaving about half an inch on either side. The fluid contained in the blister gradually drains away.

In most hospitals the treatment for severe burns is now tannic acid. First-aid methods must anticipate this. Grease, which might spoil subsequent tannic acid treatment, should be avoided. Tannic acid preparations can readily be obtained for home use. Smaller ulcerations may heal quite well if treated with ambrine, boro-vaseline or lint, one of the many tannic acid jellies, or picric acid (1 p.c. in watery solution).

Paraffin preparations may be used for burns of the first and second degree. If not available, the burn should be covered up with cloths soaked in boracic acid solution, or in the case of a limb it might be immersed in warm water in which 4 heaped tablespoonfuls of baking soda have been dissolved till the doctor sees it. The cloths should be kept moist with the solution, as if allowed to dry they adhere to any raw surface.

When much scarring takes place after a burn, there is a tendency for the scar to contract, and if a joint is involved its movement may be impaired; or where opposed surfaces are involved, they may adhere together. The greatest care should be taken in carrying instructions given by the doctor regarding the position in which the parts are to be kept. *See* Bandage; Carron Oil; First-aid; Scald.

BURNER: How to Keep Clean. In oil lamps for table or wall use the burner is generally made of several pieces of brass, variously arranged. One part adapted to screw into the reservoir or oil container is called the body; another part, to guide and support the wick, is the wick tube, and a part to support the glass or shade is the gallery.

The wick tube generally has an extra part to accommodate a shaft and cog wheels to raise and lower the wick. Oil burners for heating stoves are made on similar lines, but some burners have perforated metal cones in place of a chimney, and these vaporise the oil, which then burns with a hot, blue flame.

The modern gas burner is made on the lines of the Bunsen. Gas stoves of all kinds have one or more atmospheric burners. These automatically mix the air and gas in correct proportions to ensure a hot flame, although the best makes are fitted with independent means of adjustment.

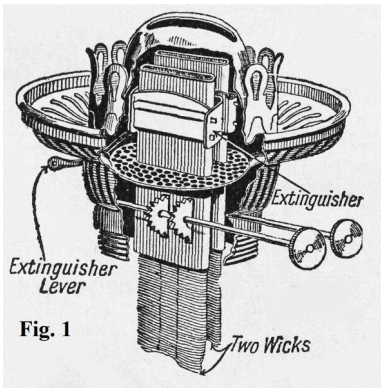


Fig. 1

Burner: sectional diagram of two types of paraffin oil lamp burners. Fig. 1 Duplex flat wick.

Fig. 2, with spreader.

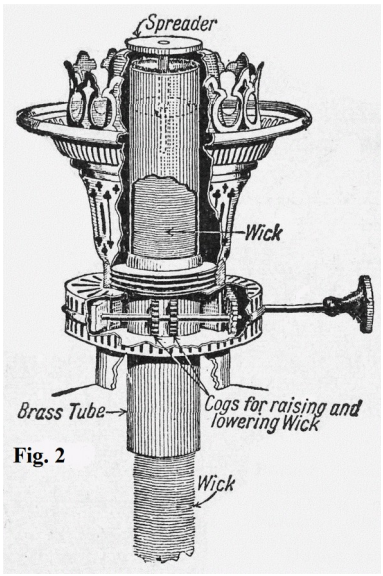
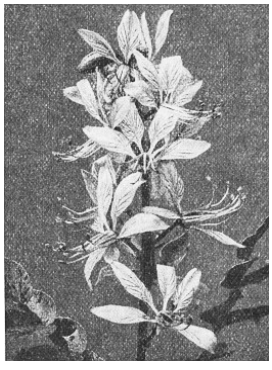


Fig. 2

To obtain the best results from any form of burner, cleanliness is essential. A dirty oil lamp always gives off a strong odour. See that all screw-threads on lamp bodies and fillers are sound, and that the requisite washers are present and in good order. Wipe off carefully any spilt oil. Paraffin oil burners are easily cleaned by removing the wick and boiling the burner for half an hour in strong soda water, drying off over the fire.

Incandescent gas burners should be cleaned from time to time by removing them from the bracket or fitting, taking the burner apart, and blowing or brushing away all dust and accumulated dirt. If this cleaning is not done occasionally the air passages become clogged with dirt, and a greater proportion of gas has to be burned. The same remarks apply to warming and cooking stoves. The burner is in this case generally made of cast iron. When dirt or dust accumulates within the passages cast into the burner, it is removed by boiling in soda water, or by brushing. *See* Acetylene; Bunsen Burner; Gas; Lamp.

BURNING BUSH.



Burning Bush. Flower spikes and leaves of a garden plant with a particularly pleasant scent.

Dictamnus fraxinella, as the burning bush is known to botanists, is a herbaceous hardy perennial, 2 to 3 ft. high. It bears alternate pinnate leaves and purplish red-veined flowers in summer, and has a pronounced and agreeable odour. During hot weather the plants exude a volatile, inflam-mable oil which may ignite if a lighted match is put to it. If stock is wanted, it is best to break up one plant only and use small portions of the fleshy roots.

BUSH FRUIT. This term is usually applied to small fruits such as raspberries, currants and gooseberries, but larger fruits also may be grown in bush form, e.g. the apple. Bush fruits are commended to those with only limited space, and, given suitable soil and position, provide good crops with very little trouble. November is the best time for planting. After-care is important, light hoeing and freedom from weeds being of great benefit. Under-cropping with low growing vegetables, if necessary, may be carried out almost to the stems of the trees.

BUTCHER'S BROOM. A native evergreen, found on the heaths, butcher's broom has angled, erect stems, and rigid, twisted spiny leaves, on the centre of which the greenish white flowers appear in early spring. They are followed by red berries in early winter. The height is 2 to 4 ft. This shrub is dioecious, i.e. male and female flowers are on separate plants. Both must be planted to ensure fruits. A good shrub for shady places.



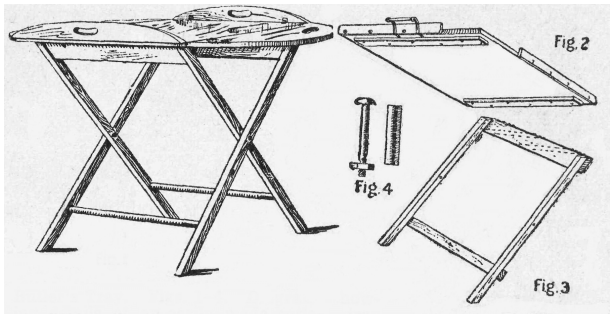
Butcher's Broom. Spray of foliage and berries of the evergreen heath plant.

BUTLER: His Duties. The butler is the head man-servant. He has charge of the wine cellar and the plate, supervises arrangement of meals, and directs the servants who wait at table. It is the butler's duty to announce visitors whom the footman has admitted and ushered in. If there is no valet, the butler looks after his master's wardrobe and sees that his clothes have been brushed and laid in readiness. At night he sees that the house has been properly closed up. The butler generally takes his meals in the housekeeper's room, and is responsible for the indoor men servants.

BUTLER'S TRAY: To Make. The principal object of the butler's tray is to provide a corner where dishes can be placed while meals are served. It consists of an oblong tray on a stand, and has flaps on either side; when raised and fixed, these form an edging to prevent plates slipping off the tray. Holes cut in the flaps allow the fingers to pass through so as to carry the tray (Fig. 1). The stand is X-shaped and collapsible.

Another type, without flaps, and carried by means of fixed handles, is simply made either in mahogany, oak, or white deal. The top should be 2 ft. to 2 ft. 6 in., and 18 in. wide, using ¾ in. material. If deal is used, a piece should be obtained which is 9 in. wide and double the length required. This is cut in two and the pieces glued together, so as to get the 18 in. of width required for the top.

Two battens about 2 in. wide are screwed to the underside (Fig. 2), the edges and corners being bevel-led. These not only strengthen the tray but prevent the wood from warping through hot dishes being placed on the tray. A narrow edging should be fixed round the sides with round-headed brass screws.



Butler's Tray. Figs. 1-4. Diagrams showing details of an easily made butler's tray.

A convenient height for the stand is 2 ft. 9 in. It is made in two separate frames, one fitting inside the other, so that one will be 2 in. wider than the other. If the top is 2 ft. in length, the legs should be cut off 3 ft. 1 in. long, from 1 in. deal, the width being 1¼ in.

Place all the legs together and mark across them the centre, where a hole is bored to take the bolt, which should be as thin as possible so as not to weaken the legs; also mark the length. The legs have to be cut at an angle to conform to the top and floor.

Next, screw at the top of each pair of legs, a cross-piece 3 in. wide, and another piece 6 in. from the bottom 2 in. wide, as in Fig. 3, allowing 2 in. difference between each frame; the top pieces are bevelled at the same angle as the top of the leg. The frames are fastened together by two bolts (Fig. 4), the hole being bored large enough to take the collar, which is slightly longer than the thickness of the two legs.

To prevent the frames from opening too far, three pieces of webbing are tacked to the top cross-pieces. When fastening these, it should be noted that the stand fits just inside the two battens under the top, so the webbing should be cut accordingly. A suitable finish can be given by staining the wood a dark shade and then polishing. The brass handles should be fixed after polishing.

BUTTER AND BUTTER MAKING

Simple Methods for Use in the Home Dairy

Consult further Diet; Vitamin; and the entries in this work on Cheese; Cream; Milk, etc.
See also Churn; Separator

Butter is essentially the fat of milk. If fresh milk is allowed to stand for several hours, the fat in the form

of cream rises to the surface, the larger globules first, and the small ones only after a long period. The cream, skimmed from milk that has been allowed to stand, contains besides the fat also some of the curd (casein) of the milk and some of the watery part, of which the skim milk principally consists. This method of obtaining cream for butter-making leaves still some of the milk fat among the skim milk. The milk is placed overnight in large shallow basins and in the morning the cream is skimmed off.

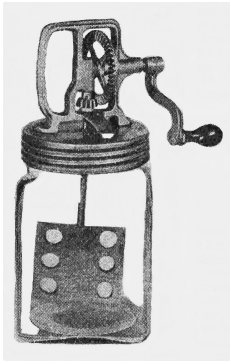
A more effective separation is obtained by the use of a machine called a separator. This revolves at a high speed, some 1,000 revolutions per minute, and, as the fat and the water are of different weight, the fat is driven in a layer to the top, and is drawn off by a tube fixed at the plane where the watery part ends and the fat layer begins. These machines are made in small sizes, suitable for home use. In one of these small separators an iron enamelled stand and crank are screwed to a table, and on them rests the separator proper, consisting of an upper bowl-like part into which the milk is poured. In the bottom of this bowl is a small hole plugged by a metal rod. This must not be removed until the separator is revolving at full speed.

Beneath this bowl, and fitting into it, is another small bowl containing a number of inverted, cone-shaped disks fitting closely one over the other. These revolve when the crank handle of the separator is turned, and by their rotation the fat or cream is separated from the watery part of the milk. The cream runs out through one spout and the separated milk through another, and both are collected in separate basins. After the separator has been used, it is taken apart and its component portions washed in boiling water to which a lump of washing soda has been added. It is then rinsed in clear boiling water, dried and put together again. The crank-handle should be oiled two or three times a week.

Each day the cream separated can be run into the same basin and then set aside to ripen or become fit for churning. When the cream is two or three days old the butter is of a richer colour and flavour. The best temperature at which to churn the cream is about 60° F.; if it falls below this the churning has to continue longer before butter materialises. In hot weather it may be desirable to stand the churn in a basin of cold water to which chips of ice should be added.

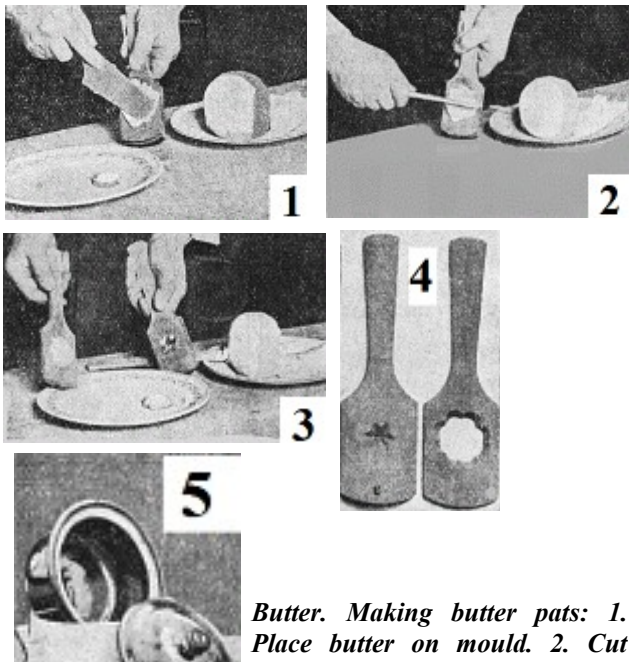
Churning and Washing. For use in small households, the best kind of churn is a glass jar with a screw top, through which passes a rod holding wooden paddles inside the jar and a handle for turning them, like that of a mincing machine or egg whisk. The churn and paddles must be scalded before use, and everything must be thoroughly clean. The top of the churn is taken off and the ripened cream poured into the jar. The top is then screwed on and the handle turned, slowly and steadily at first, and gradually quicker, until the revolutions of the paddle are almost sixty a minute. The cream becomes thicker until it is like a thick custard After a few more turns of the paddle it becomes grainy and little flecks of butter appear.

The churn is then opened and a cupful of cold water thrown in. It is then screwed down again and the paddle gently turned.



After about six turns the grains of butter become bigger, sticking together in clots, and most of the buttermilk sinks to the bottom of the churn. The churn is then opened and its contents poured into a basin.

Butter. Simple butter maker for household use.(Courtesy of the Staines Kitchen Equipment Co., Ltd.)



Butter. Making butter pats: 1. Place butter on mould. 2. Cut away surplus, first top, then bottom half. 3.When moulds are separated, the pat will come out. 4. Pair of moulds. 5. Butter cooler in pottery. (4, courtesy of Staines Kitchen Equipment Co., Ltd., 5, courtesy of Selfridge & Co. Ltd)

Clear water is put in a second basin, and by spoonfuls the butter is lifted out of the butter milk and placed in the water. The butter is squeezed and kneaded with wooden spoons to get rid of the buttermilk. The washing water is changed repeatedly until it remains clear. If buttermilk is left in the butter it will not keep, and also has a sour flavour. When the last washing water has been drained off, the butter is sprinkled with fine salt and the latter well worked in; this helps to preserve the butter.

The quantity of butter produced by a given quantity of milk varies. The average should not fall much below ½ lb. from a gallon of milk. If too much water is left butter soon turns rancid. When the quantity made is for domestic use, the butter may be first prepared as described, and then remixed with a small quantity of fresh milk. If prepared for commercial purposes it must not contain more than 24 per cent of water. The commendable points about milk-blended butter are that

it has a pleasant flavour and a creamy consistence. It does not keep well, but in small quantities this is not so important.

Butter, being easily contaminated, should be kept in the coolest part of the larder, away from meat, fish, onions, or other strong-smelling foods. When choosing salt butter, test it by plunging a knife into it. If, when withdrawn, the knife has an unpleasant odour, the butter may be regarded as rancid.

Butter contains the food principle or vitamin also found in beef-fat, the yolk of eggs, and in fish-oil. As a food butter is a heat-producer. In an average diet about two ounces per day, including cooking, is enough. Much information on butter-making and means for overcoming faults and difficulties is given in Leaflet No. 184 issued by the Ministry of Agriculture.

Butter Cooler. The various types include those made of porous pottery the butter being placed on a tray which rests upon another containing water. The cover is placed over the butter and rests in the water, with the result that the porous pottery absorbs a considerable amount of the water and so becomes cool. Butter coolers are also made in zinc.

BUTTER BEANS. Prepared and used similarly to haricot beans, these beans are larger and possess a more delicate flavour. The skins are somewhat indigestible and if desired may be removed by putting soaked beans in boiling water for a few minutes, and then into cold, when the skins will easily come off. To serve as a hot vegetable, soak 1 lb. beans overnight, then put into a saucepan of cold water, with a piece of dripping or a lump of fat. Boil until tender (2-3 hours), replenishing with hot water, if necessary, and about ¼ hour before serving add salt and other seasoning to taste. They are excellent eaten with boiled bacon, or they can be served with tomato or cheese sauce on hot buttered toast.

To make rissoles, prepare ½ pint beans as above, adding 1 teaspoonful mixed herbs with seasoning about ¼ hour before done. Pass through sieve and mix with yolk of one egg and ¼ pint stale breadcrumbs. Shape mixture into balls or flat cakes, coat with white of egg and more breadcrumbs, and fry golden brown.

A good thick soup is made by soaking and skinning 1 pint beans and putting them into 3 pints cold water or unsalted stock, with celery, onion, tomatoes, chopped parsley and pepper.

(Salt must not be added until beans are tender.) After boiling pass the whole through a sieve, boil up and add 1 oz. butter and more water or stock, if necessary. A ham-bone or bacon trimmings, added while soup is cooking, improves the flavour. *See* Beans; Haricot Beans.

BUTTERCUP. The yellow buttercup of the meadows and pastures is a wild species of the Ranunculus, and is also known as the crowfoot. This is a very troublesome weed in gardens. It must either be spudded out or killed by dropping carbolic acid on the crown of each plant. Another method is to dip an iron skewer into sulphuric acid and force it down the centre of the plant. The best remedy, however, is thorough digging of the ground, picking out and destroying all the roots as digging proceeds.

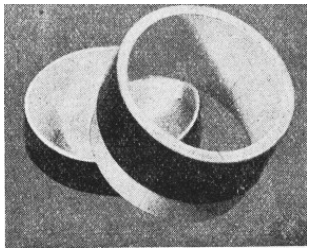
BUTTERFLY AND MOTH COLLECTING

Securing and Preserving Favourite Specimens

Following the entry Birds' Eggs, another article that deals with a collecting hobby, the reader will find instructions about making a suitable cabinet for his exhibits

In making a collection of butterflies or moths two methods are adopted: to catch the mature insects with a net, and to rear the caterpillars. By the latter method more perfect specimens will, as a rule, be obtained.

The butterfly net is made of mosquito netting or leno, with a hem of stouter material around the mouth through which passes the cane frame. If made at home it is advisable to purchase a brass Y-tube. The lower arm of this fits on the end of a stick and the upper arms take the ends of a curved cane which, before bending, measures about 3 ft. The depth of the net-bag should be twice the width of its mouth, and should have a rounded bottom, the stick being the length of a walking-stick.



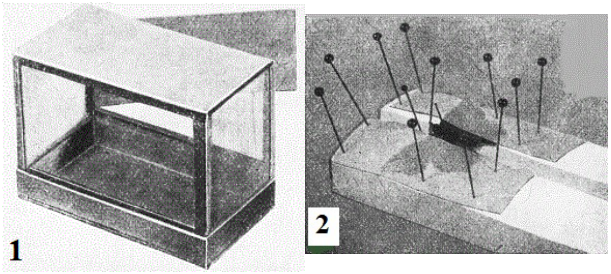
Butterfly Collecting. Glass-bottomed box, 1½ in. diameter, used for catching moths.

Armed with this net, the collector visits such places as he has observed to be the haunts of butterflies: flowery fields, green lanes, heaths, the borders of woods and the open rides through them. For butterflies this must be in sunshine, preferably in the morning. Moths, being mostly night-fliers, must be sought after sunset. While many moths are attracted to light, others may be trapped by dipping rags in a boiled mixture of coarse foot-sugar dissolved in beer. The rags are pinned to trees, or a stripe of the sugar painted on the tree trunk. These baits are visited with a lantern; the moths will be captured easily, each in a separate glass-bottomed box, about 1½ in. in diameter.

Many kill their butterflies whilst still in the net by nipping the fore-body between finger and thumb; and if neatly performed this is effectual by compression of the chief nerve centres. Others put their captures into a cyanide killing bottle, or bring them home alive, each in its box.

Specially made entomological pins of various sizes are used for pinning, and these are obtained from the dealers by the ounce, ½ or ¼ oz. A pin of a size proportioned to the stoutness or slenderness of the insect's body is passed straight through the fore-body (thorax) and the protruding point inserted in the central groove of a corked setting board. The wings are then carefully arranged in the conventional manner,

and secured in position by strips of thin card pinned to the cork surface, but not through the wing. The antennae and forelegs are secured in a similar manner. The specimens should be allowed to remain undisturbed until the hind body has become stiff, which takes from 10 days to a fortnight. A little disk of paper with the locality where taken and the date should be transfixed by the pin under the insect.



Butterfly Collecting. Some requisites: 1. Breeding cage for caterpillars. 2. Setting board with specimen in position beneath thin paper for drying. 3. Specimens in position in cabinet drawer.

Caterpillars for rearing may be obtained by noting plants whose leaves have been partly eaten; the spoiler may be hiding on the underside of the leaf or lower down the stem. The beating of trees or bushes over an open umbrella will yield many caterpillars. At home these should be placed on a sprig of the proper food in a breeding cage, which may be a box with a glass front and with perforated zinc or wire gauze at the back or top. The food can be kept fresh by having a small bottle of water with a hole bored through the cork large enough to take the stem of the plant.

In the cabinet drawer the insects should be arranged in vertical rows, each species with a neat label bearing the name below the specimens, which should include one of each sex, an example set with the lower side uppermost, and any others that show marked departure from the typical form, colour or markings. The latter are known as aberrations and varieties.

The drawers of an insect cabinet are un-divided, the bottom is lined with sheet cork to receive the points of the fine pins, and the framed glass lid fits airtight. There are cells to contain camphor or powdered naphthalene, as without one of these deterrents the specimens will be reduced to dust by mites, book-lice or other enemies. The cabinet should stand clear of the wall—especially an outside wall—to ensure safety from damp.

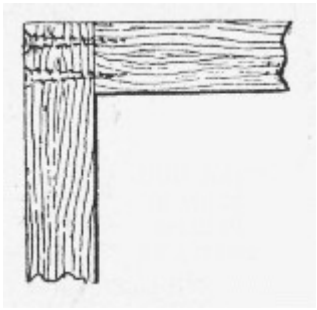
Should a cabinet be considered too expensive an item on beginning the collection, the insects may be housed safely in store-boxes which can be obtained from any dealer for a few shillings. A very suitable cabinet for butterflies or moths can be made on the lines of the birds' egg cabinet described under that heading.

BUTTERFLY FLOWER. The schizanthus, or butterfly flower, is a greenhouse plant that blooms abundantly in summer. The best results are obtained by sowing the seeds under glass in September and repotting the seedlings as is necessary, finally placing them in 7-in. pots. They develop into fine plants and bloom in May and June. Seeds may also be sown in the greenhouse in spring. There are many varieties. The colours include rose, orange, and lilac, as well as white.

BUTTERMILK. This is useful in making biscuits, cakes, scones, etc. When combined with bicarbonate of soda, less cream of tartar is required than where fresh milk is used.

Butterscotch. *See* Toffee.

BUTT JOINT. The simplest of all joints is the butt, which might be described as the abutting of one piece of material on to another. It can be made in wood, metal, or other material. It is in woodwork that the butt joint is mostly used, and it is generally secured by glue, nails, or screws.



Butt joint in wood secured by screws.

There are certain essentials to success in making a simple butt joint. The work must be measured correctly, cut off square and true, and assembled and nailed together in proper order.

In metal work, a butt joint is usually riveted, brazed, or welded, examples being the riveted butt joint of a girder or bridge and the welded butt joint of ordinary gas pipe. *See* Box; Joint.

BUTTON. Small machines and supplies of button moulds are obtainable for making cloth-covered plain buttons, thus enabling the home dressmaker to turn them out neatly covered in any kind of self material.

Craft workers in metals can make enamelled and filigree buttons, and also original designs in beaten metal. Neat fingers and a hook are needed to plait strips of leather into buttons suitable for tweed coats.

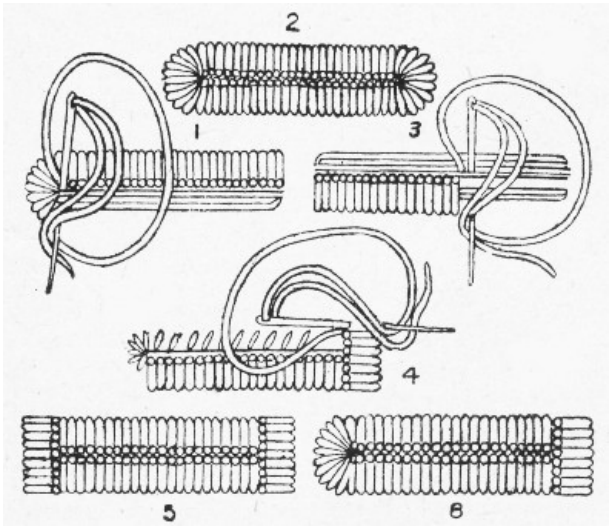
The larger sized moulds, if for embroidered buttons, may be covered by hand. Cut out a circle of material half again as large as the mould, whip round the edge, place over mould, and draw up tightly, finishing off underneath. In most cases it is better to embroider the material, either in silks, wools, or beads, before it is cut up into circles for covering the moulds; but care must be taken to keep the design within the area of stuff that will show on the right side when the button is finished.

To sew buttons on firmly, stitch many times to and fro through the garment and the holes in the button or its shank or the material covering it. Finish before fastening off by winding the cotton tightly several times round stitches, between the button and stuff. A thin

material may be strengthened if a small square of stuff is is put on the wrong side of the garment and sewn in with it and the button. For heavy coat buttons strain is avoided by a small button placed on other side of the material and stitches taken through both buttons.

BUTTONHOLE: How to Make. Before cutting buttonholes important points to decide are whether they are to run across or down; whether they will look better rounded at one end or square at both ends. If the button is to rest at one side of the buttonhole when the garment is fastened, then a round end at that side allows the button to fit in snugly.

To make certain that buttonholes are even, take a piece of light cardboard and make a notch in this, within one end, corresponding to the distance required between each buttonhole, and thus mark their positions. Buttonholes are usually sewn with a thick twist cut a little longer than the length required for one buttonhole. The starting of a new thread before the buttonhole is complete spoils the even effect. Take ¾ of a yard of twist for a ¾ in. buttonhole and proportionate lengths for a larger or smaller one. Use buttonhole scissors for cutting and make a clean slit of the required length. Where the rounded end is to be, hollow a little out with the scissors. If the material is woolly or liable to fray, it is necessary first to overcast all round with cotton. Where the buttonhole is to be worked through a double thickness, it is important to tack round the position for the buttonhole, to keep the layers from slipping when working.



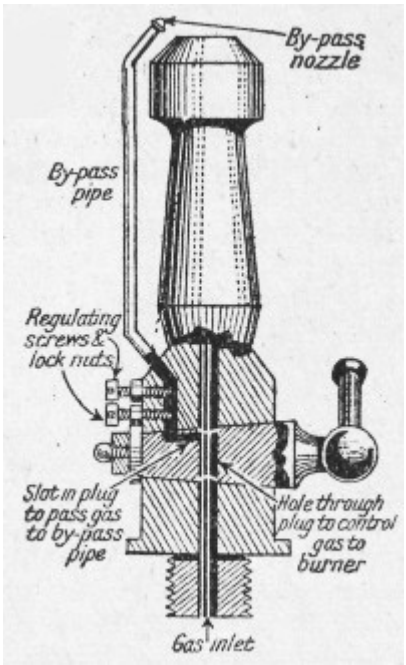
Buttonhole.
1. Making a round end.
2. Buttonhole with round end.
3. Buttonhole-stitch.
4. Making a square end.
5. Buttonhole with square end.
6. With rounded and square ends.

Commence stitching at the end farthest from edge of material, and work from left to right. Insert needle through buttonhole from back to front about ⅛ in. from lower cut edge, and taking the doubled silk that comes from the eye of the needle, put it under the protruding point of the needle from left to right; then draw the needle through, pulling it upwards so that the knot of the stitch comes exactly on the cut edge of the buttonhole. Repeat for the other stitches, making them exactly equal in length. When the rounded extremity is reached the stitches must diverge like the points of a star. For a square end make a row of buttonhole stitches at right angles to the line of the buttonhole and have knotted ends inwards, but first make two or three straight stitches across the end. *See* diagrams below, also Appliqué.

BY-PASS: How to Test. The name is given to a mechanical device whereby a gas burner (for example) can be lighted up or turned down without matches. One type of construction is seen in the diagram and consists of a separate small passage-way, controlled directly by the gas tap.

In the best makes of gas-burner the by-pass has a regulating screw and locking nut. The lock nut is to hold the screw in place when the correct adjustment has been found. If the by-pass flame is too small it will be blown out by the rush of gas from the burner, thus causing an escape which, in a closed room, may have serious consequences; if too big, it will waste the gas and cause the mantle to be blackened and soot up.

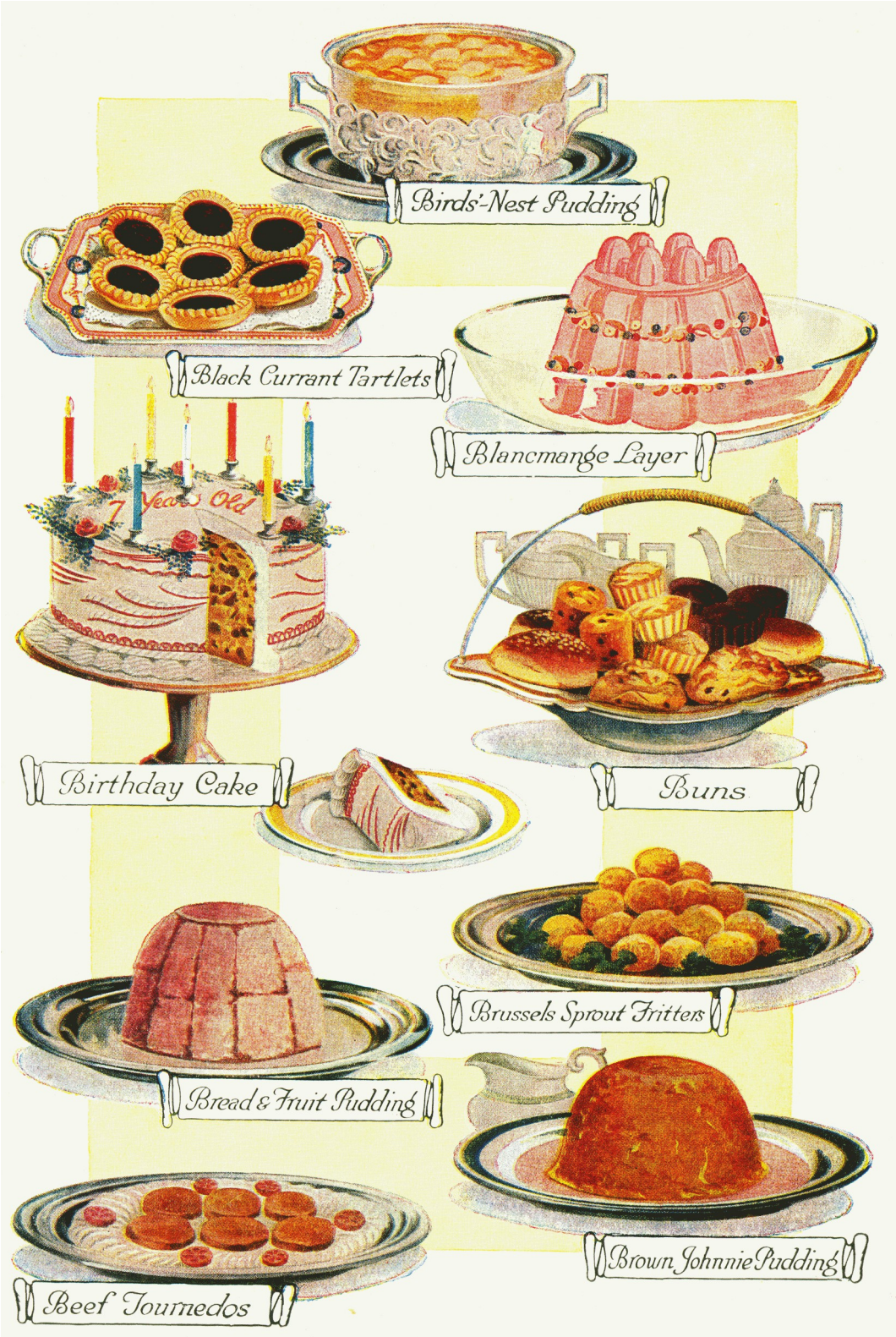
With some makes of incandescent burners the gas tap turns off the gas to the by-pass when the burner is fully lit, but re-admits gas to the by-pass when the light is lowered. Such burners need careful adjustment, or are liable to fail if turned on or off too quickly.



By-pass. Sectional diagram of incandescent gas burner, showing arrangement of by-pass.

The nozzle of the by-pass tube will become choked up with deposit after lengthy and continued use; it can be cleaned by wiping with a dry rag and pricking out the hole with a very fine wire, or a burner pricker. On most gas geysers the by-pass jet is controlled by a small tap, but the same principles of adjustment and cleaning apply.

CABBAGE. Growing freely in all soils, the cabbage is a very hardy plant. It can be sown to yield produce at most seasons, but chiefly in spring, early summer, and autumn. If the hearts are not cut too low,



'B' RECIPES: A SELECTION SHOWN IN ACTUAL COLOURS

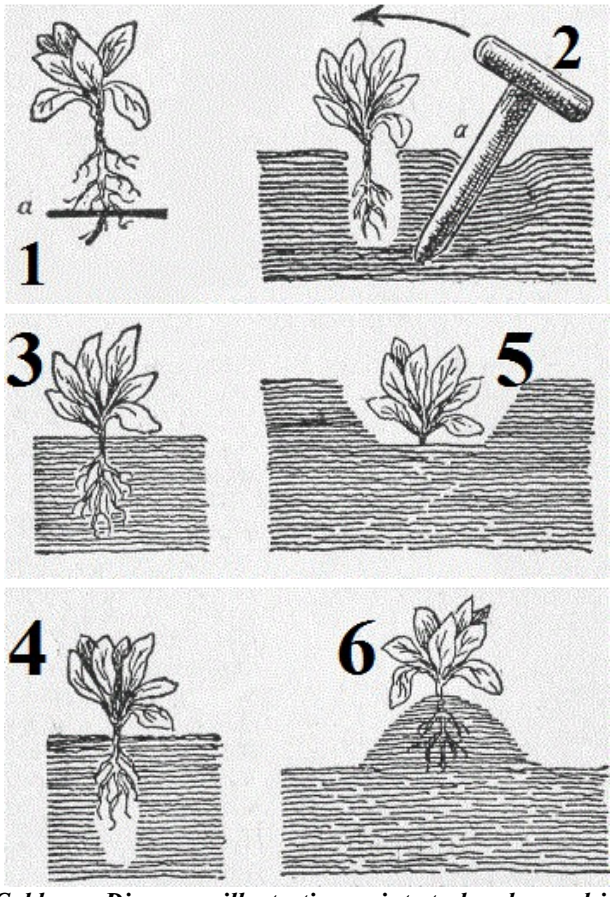
Birds'-Nest Pudding, made of apples cored and filled with sugar, put in greased pie-dish, with lemon-flavoured sago boiled and poured over, and the whole baked in a moderate oven. Black Currant Tartlets, made of short pastry filled with syruped fruit. Bread and Fruit Pudding, more usually called Summer Pudding. Beef Tournedos, thin fillets of beef, fried and garnished with mushrooms, sliced tomato or mashed potato.

but near the base of the lower leaves, the stump will throw up secondary sprouts.

It enjoys a deep, rich soil, but while the ground may with advantage be fertile, it should also be firm, especially for the spring crop. Yard manure of any kind is suitable. Sulphate of ammonia or nitrate of soda, 1 oz. per sq. yard, should be applied occasionally in spring and summer.

Cabbages for late summer and autumn are sown in March and April, for spring in July and early in August. One ounce of seed should produce 1,000 plants. Like borecole, cabbage is transplanted. Large sorts are planted out 2½ ft. all ways, medium sorts 2 ft., small or very compact varieties, 18 in.

Some varieties of cabbage are suitable for sowing in spring, others for sowing in July and August. Excellent sorts to sow in summer are Harbinger, April, Flower of Spring, Mein's No 1, Ellam's Early and Emperor, they will supply produce in spring and early summer. The following, if sown in March, will furnish cabbages in late summer and autumn: Little Pixie, Tender and True, Imperial, Enfield Market, Emperor, and Winningstadt.



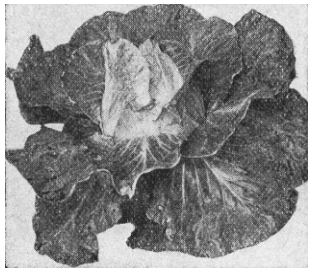
Cabbage. Diagrams illustrating points to be observed in planting.
1. Cut off tap root at 'a' before planting.
2. Place in hole and lever over soil with dibber (a).
3. Correctly planted cabbage.
4. Badly planted cabbage, with space beneath root.
5. How to plant in dry soils.
6. Method of planting in wet soils.

Colewort is a first-rate small cabbage to sow in April and May for autumn produce: the seedlings should be thinned out to 10 in. apart, not transplanted. Red or pickling cabbage is sown in August. Savoy cabbage, a valuable hardy winter vegetable, is sown in April and May. The Drumhead cabbage, from an April sowing, yields firm hearts in late autumn.

The Portugal cabbage, or couve tronchuda, is valued for the sake of its thick midribs, which are almost as good as seakale, as well as for the head of cabbage. It is grown from seeds sown under glass in March or out of doors in April.

Chou de Burghley, which produces a broccoli-like head, is sown under glass in March for an autumn supply, or out of doors in May for spring use.

Bolting or premature running to seed is most troublesome in the spring crop sown after midsummer; it is most likely to occur when a dry autumn is followed by a wet winter. Sowing the right varieties at the right time, planting on a firm bed in October, and hoeing and feeding in spring are measures which are likely to prevent bolting. *See* Black Rot.





Cabbage. Above. Conical cabbage. Right. Hard-hearted cabbage of Drumhead variety.

Cooking the Cabbage.

To boil cabbage, first remove all discoloured leaves and the stump of the stalk. Halve the cabbage, or, if it is large, quarter it, and then remove a wedge-shaped piece from the stalky centre. Wash the cabbage and let it soak in cold salted water; then put it in a saucepan containing plenty of fast-boiling water, allowing to each quart of it a tablespoonful of salt and a piece of soda the size of a large pea.

Boil the cabbage quickly, the lid being off the pan, for 15 to 40 min., or until the leaves and smaller pieces of stalk are tender. The time needed will depend on the age and size of the cabbage. Strain off the water through a colander, pressing the cabbage firmly. Heat again in the saucepan with 1 oz. butter; add seasoning and serve in a hot vegetable-dish, cutting the cabbage across in portions.

The water in which greens have been boiled must never be poured down the sink without afterwards flushing it with water. It is better to pour it away outside if possible, since it often has a strong and somewhat objectionable odour.

Stuffed cabbage provides an excellent way of using up scraps of meat. Should there be no scraps in the

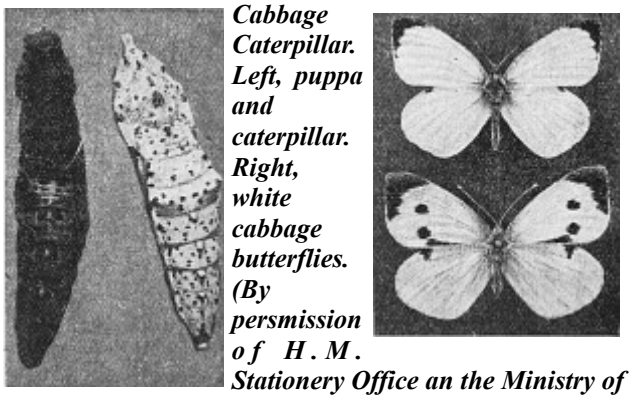
(Continued in page 315)

larder use ½ lb. of sausages, preferably pork. Wash and trim a savoy cabbage, put it in a pan of boiling, salted water, and boil it until it is half done, then drain it well. Cut it nearly in half, and remove a piece out of the centre.

If using sausages, remove the skins and mix with the meat a good dust of salt and pepper, 2 dessertspoonfuls chopped parsley, 1 dessertspoonful chopped onion, and 1 oz. rice, which has first been boiled until tender in salted water. If scraps are being used, cut off all skin and gristle, chop the meat finely, and use it instead of the sausage-meat. Next press the mixture into the cavity in the cabbage, put the two halves together, bind them round with a piece of tape, then wrap the whole in a piece of muslin, put it in a pan with plenty of boiling salted water, and boil until the cabbage is tender. Take off the muslin, and tape, arrange the cabbage in a hot dish, and pour round it some brown sauce. This is sufficient for four persons.

CABBAGE APHIS. This is a pest frequently found in colonies on the outer leaves of the cabbage. It does not affect the hearts, except by weakening the constitution of the plant. If the plants have good soil to grow in and are stimulated by vigorous hoeing, no further steps are needed. Should the pest threaten to give them a serious check, it may be as well to use an insecticide; but this is only likely while the plants are young; at a later stage the outer leaves can be broken off.

CABBAGE CATERPILLAR. The caterpillars which are so destructive to cabbages and cauliflowers are usually those of white butterflies or those of the cabbage moth.



Cabbage Caterpillar. Left, puppa and caterpillar. Right, white cabbage butterflies. (By persmission of H. M. Stationery Office an the Ministry of Agriculture)

White butterfly caterpillars perhaps feed more on the outer leaves of cabbages, while those of the cabbage moth burrow more into the hearts of the plant. In a normal year the pests can be kept under control in a small garden by hand picking. During the periods when white butterflies are seen on the wing in some number, crops liable to attack should be examined about once every 7 to 10 days, and all clusters of eggs should be crushed.

It is unwise to use poisonous sprays on green vegetables, but syringing the plants, especially underneath the leaves, with paraffin emulsion or with a solution of salt, 2 oz. in 1 gallon of water, does good. Paraffin emulsion is made by dissolving a handful of soft soap in a little hot water, adding an eggcupful of paraffin and 2 gallons of water. This treatment is necessary in July and August. If the above simple solutions do not prove sufficiently effective, the following suggestions are offered in Leaflet No. 69, issued by the Ministry of Agriculture.

Slaked lime in powder or lime and soot are sometimes dusted on the plants when damp. Fences, etc., surrounding allotments should be searched for the chrysalides of white butterflies. When the ground is dug, a look-out should be kept for the brown chrysalides of the cabbage moth, which should also be destroyed.

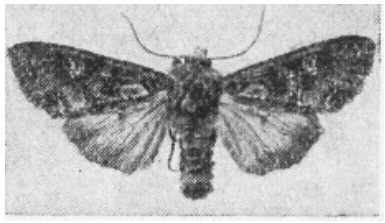
CABBAGE FLY. The larvae of a grey fly infest cabbages in summer and cause them to turn yellow and droop in the hot sun. Its name is Anthomyia brassica, or the cabbage fly, and it must not be confused with the aphis or green fly. The male cabbage fly is quite a slate colour; the female is lighter. Spraying or the wholesale use of insecticides is not of much use. The only safe plan to prevent the pests from spreading is to pull up infested plants and burn them, at the same time giving the ground a good dressing of lime.



Cabbage Fly larvae, highly magnified.

CABBAGE MOTH. The cabbage moth is a dark brownish grey in colour; the caterpillar varies in colour between green and brown.

It feeds upon lettuce, mangold and various wild plants, but is especially fond of cabbage. Unless care is taken in dissecting and washing close hearts before cooking, the full-grown caterpillar may make its appearance at the table. The moths should be watched for in the evenings of June and July, when they are egg-laying. The caterpillars feed from July to October, when they go under ground to pupate and pass the winter.



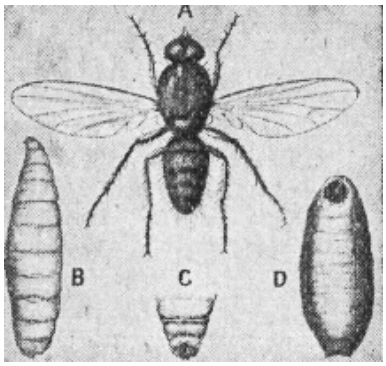
Cabbage Moth, the caterpillar of which is a destructive pest.

The most effective method of dealing with this pest is to hunt for the caterpillars, which feed during the day-time as well as at night. The plants may be watered with soapsuds, a little paraffin oil being added; but this should not be done if the cabbages are likely to be cut within a period of four or five weeks.

CABBAGE ROOT FLY. One of the most destructive of insect pests, the cabbage root fly attacks cabbages and cauliflowers chiefly, but also sprouts, broccoli, and turnips, young vegetables suffering more severely than older plants. If an affected plant be pulled up it will be noticed that most of the small lateral roots have been eaten away, and the maggots are to be found around the main root or in the soil close by. It is in the maggot stage that the insect is injurious, the flies causing no direct harm.

A most satisfactory method of control is to protect the plants by means of tarred felt disks, particulars of which are contained in the Ministry of Agriculture's Leaflet No. 18. The disks act as a mech-anical device preventing the flies from laying their eggs near the roots of the plants. The disks should be placed quite flat on the ground round the stems of the plants directly the latter are planted out.

It is also advantageous to earth the soil up slightly around the plants, so as to form a flattened ridge. It is important to keep the surface of the disks free from soil. Once the plants have made good growth they have been tided over the most vulnerable period, and the soil can be earthed up over the disks, as the latter are then no longer necessary.



Cabbage Root Fly. A. fully developed fly. B. larva. C. tail-end of larva. D. pupa. (By permission of Ministry of Agriculture)

CABBAGE SNOWY FLY. Resembling in appearance a minute moth, the cabbage snowy fly is a four-winged insect allied to the scale-insects. With wings fully spread it measures only ⅛ in. across. Both body and wings are coated with wax in a meal-like form, and this is shaken off where their yellow elliptical eggs are laid, so that the presence of the latter is revealed by these dusty patches. In spring they may be seen fluttering about the cabbages and laying their eggs on the undersides of the leaves. The flat little larvae that emerge suck the juices of the plant, and the evidence of their presence is a yellowing patch on the other side of the leaf.

Washes and sprays have been recommended for dealing with this pest, but seeing that it is always on the underside of a broad, greasy leaf all liquids run off the upper surface without affecting them. The only practical remedy is to locate the larvae by means of the yellow patches, and then either to destroy them by pressure or by cutting off the leaves and burning them.

CABINETS: ORNAMENTAL AND USEFUL

For the Connoisseur and the Amateur Woodworker

Related articles are those on Bookcase; Bureau; Chair. See further Birds' Egg Cabinet; Coins; Corner Cupboard; Cutlery; also Antique Furniture; Cabinet Making

At first little more than an oblong box, the cabinet, owing to the skill of the Flemish workmen in the 16th and 17th centuries, became a magnificent piece of furniture. The wood was carved, inlaid or polished, and the piece adorned with ivory, tortoiseshell, or precious stones. The doors were beautifully painted, sometimes on the inner sides as well as the outer. The interiors were often remarkable for their elaborate decorations, these taking the form of floors made of alternate squares of ebony and ivory, and adorned with columns and mirrors, the whole resembling a palace hall in miniature.

Cabinets were made in England in the 17th century, when walnut came into vogue. Flemish influence was strong, but something was copied from Chinese cabinets, which were then being imported: hence the use of lacquer, in which excellent work was done towards the end of the century. The stands were beautifully carved and sometimes silvered. In the 18th century some cabinets were made of mahogany, but lighter woods were still much favoured, satin and tulip among them. Another development was the introduction of glass into the doors, these cabinets being chiefly used for the display of china, glass, etc.

Making a Mahogany Cabinet.

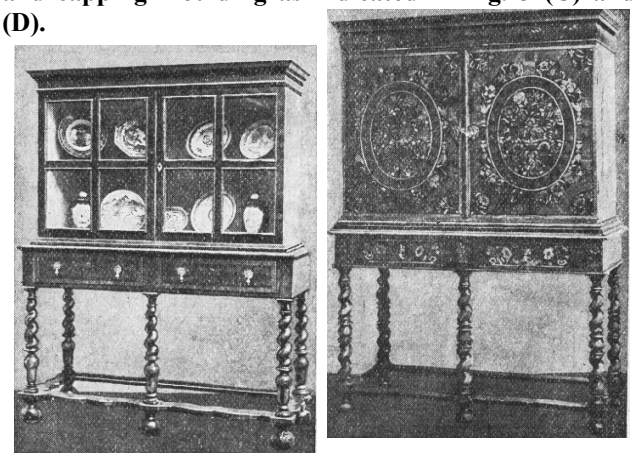
(See also page 317)

The cabinet shown in elevation in Fig. 1 could be carried out in mahogany, when it would go well, with any furniture of the Chippendale type. It has an enclosed centre cupboard and two glazed cupboards at sides. A glazed door might be fitted to the centre compartment also if desired.

The base should be taken in hand first. The long rails at back and front are tenoned into the outside legs, and the end rails are similarly tenoned to the legs. The two inside legs are bridle jointed to the front rails. A shallow groove the width of the leg is cut on the front of the rail. Fig. 3 (E), and the rest of the thickness of the rail is taken out of the leg. The rails may be shaped with the bow saw. The shoe for the legs is shown Fig. 3 (A). A centre cross rail might be added to stiffen up the base. Mouldings are mitred round as shown in Fig. 2, and supported by blocks glued to rails and mouldings at short intervals.

The construction of the carcass is shown in Fig. 2. The partitions may be dovetailed or tenoned to the top and bottom. If the latter plan is adopted the tenons should be wedged after glueing up. The top and bottom are lap dovetailed to the sides of the carcass. The back is match boarded, each board being fixed with two screws at top and bottom. The frieze box is of solid mahogany, the front corners being mitre dovetailed together and the back lap dovetailed. To allow for the width of the mouldings on front and sides the back rail of the frieze box is made a little wider. The top is fastened to the frieze by pocket screwing. The top moulding is shown in Fig. 3 (B). The pediment has base

and capping moulding as indicated in Fig. 3 (C) and (D).



Cabinet: two antique examples. Left, William and Mary china cabinet on stand, veneered with oystershell laburnum. Right, walnut and marquetry cabinet on stand, late 17th century. (Courtesy of Gill & Reigate, Ltd.)

The doors are mortised and tenoned together and then rebated. Slats are fitted for the bar mouldings, the ends being stub tenoned, and the slats halved where they cross. An astragal moulding, or a plain rectangular one, may be used for the bars, which are glued on to the slats. The panel of the centre door is caul veneered, the pieces being first fitted and glued to a sheet of stiff paper.

The shelves, which rest on fillets, are fitted so that the front edges come opposite the second and third bars from the bottom.



Cabinet. Walnut china cabinet, on chest of three drawers, early 18th century. (Courtesy of Gill & Reigate, Ltd.)

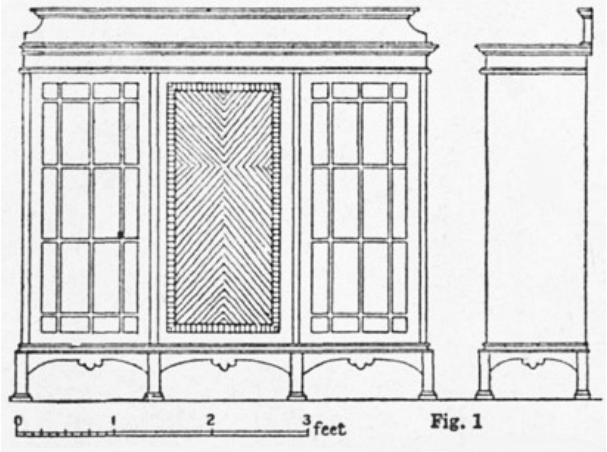
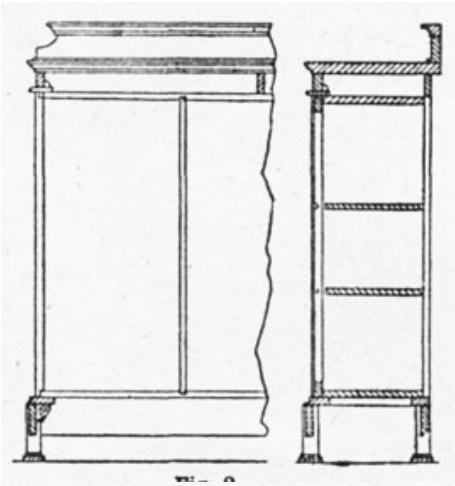


Fig. 1

Cabinet. Diagrams showing how to make a mahogany cabinet. Fig. 1.



Mahogany cabinet. Front and side elevations. Fig. 2. Details of construc-tion of the carcass. Fig. 3. Sections of mouldings and other working drawings. See text for lettering.

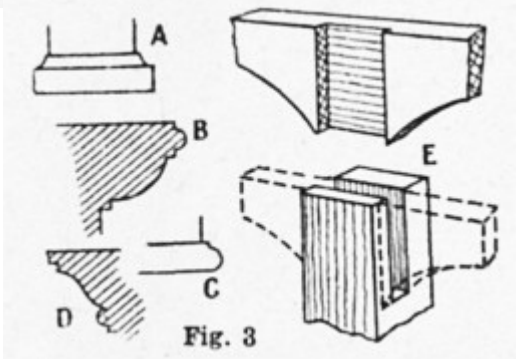


Fig. 3

CABINET MAKING IN THE HOME WORKSHOP

The Tools Required and the Principles of Construction

Further practical guidance for the amateur on this subject will be found in the articles Amateur Carpentry; Workshop, etc. See too Bench; Joint; Tenon; also Chisel; Plane and other tools

Cabinet making includes the making of all the finer articles of furniture, such as bureaux. It is thus distinguished from carpentry, which refers to the constructional forms of woodworking, such as roofing, flooring, staircasing, etc.

Most articles of ordinary household furniture can be made by the man who understands tools and is fairly proficient in their use, and if to some knowledge of timber is added skill in the making of joints, the cabinet making that can be undertaken is only limited by considerations of time and cost.

Cabinet making differs from carpentry not only in regard to the character of the work, but also in the timber used. Speaking generally, the cabinet maker uses hardwoods, such as oak, mahogany and walnut, whilst the carpenter works in the softer woods of the pine, fir, and spruce families. Hardwoods are chosen for furniture because of durability, the extra strain they can withstand, and their rich colour and pleasing grain. It is obvious that the working of oak is more laborious than the working of yellow pine, and also that surfaces which are to be polished must be brought to a higher degree of finish than boards which are to be

painted or varnished. Cabinet-work is finer, and calls for more careful workmanship than that necessary with carpentry; the material is more costly, and the aim is to produce something which is pleasing to the eye as well as of practical use.

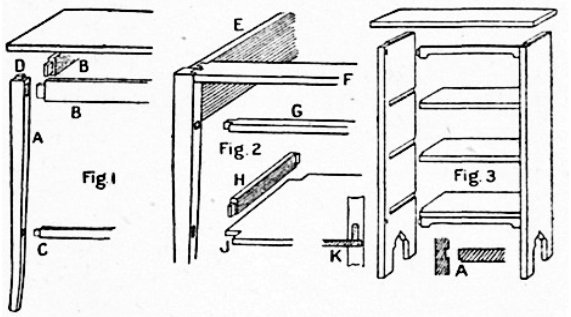
Tools Required. A hand saw with blade of 24 in. or 26 in. is required for cutting boards lengthways. A smaller tool of the same type is the panel saw with an 18 in. blade. A tenon saw of 12 in. is an essential tool, and later, for fine work, may be added a 6 in. or 8 in. dovetail saw. The bow saw is required for shaped work, and a compass saw, with its long tapering blade, is useful for interior shapes which the bow saw cannot conveniently cut. With delicate shapes in thinner wood the ordinary fretsaw is used.

Rough boards are first dealt with by the jack plane, and if a worker buys his timber in the rough he will also require a trying plane, which is requisitioned after the first operation with the jack plane. The smoothing plane— a smaller tool—is used to bring the board to a further degree of accuracy, and leaves it ready for scraping and glasspapering. Of other planes there is a great variety, many being of iron. The toothing plane, with the cutting-iron milled to resemble saw teeth, is used to roughen the surface of a board preparatory to veneering. The router is for grooving timber across the grain. In addition there are planes for rebating, for ploughing, for shooting shoulders and mitres, and the range of moulding planes.

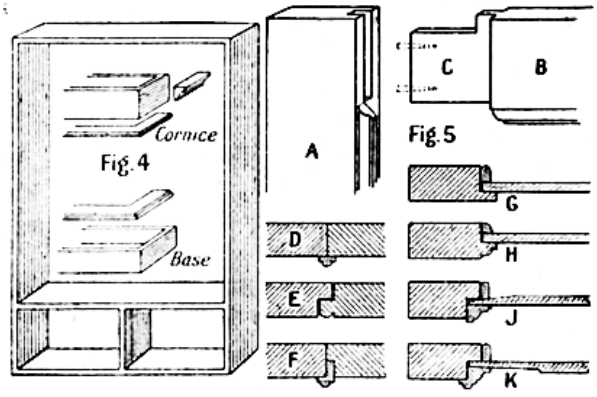
Other tools required include a range of chisels from ¼ in. to ¾ in., one or two gouges, a ratchet brace and boring bits, a try square, marking gauge and cutting gauge, a couple of spokeshaves, oilstone, glue kettle, rasp, file, two screwdrivers (large and small), several bradawls, pincers, pliers, mallet and hammers. A substantial bench is necessary, and a pair of hand cramps.

Principal Joints Used. Apart from a knowledge of joints, some of the general principles of cabinet construction should be clearly understood. A plain table of the simplest type, for example, is put together as Fig. 1. The legs (A) are mortised on their two inner faces to receive the tenons of the rails (B). If lower rails are to be introduced to strengthen the legs they will also be tenoned in, as at C. In the illustration a stub tenon (D) is shown on the top of the leg. This will enter a shallow mortise cut top of the leg. This will enter a shallow mortise cut in the underside of the top. The top itself will be glued down and additionally held either by pocket-screwing through the rails or by fitting glued blocks in the angles formed by rails and top.

In the case of a table which is to be fitted with a drawer, the method of construction usually followed is shown at Fig. 2. The ends (E) are tenoned to the legs, but at front, in stead of the upright rail, as in Fig. 1, there is a top rail (F) and a drawer rail (G). The upper rail is dovetailed to both leg and end as indicated; lower rail is tenoned to the leg. Drawer runners, etc., will afterwards be added. When a shelf with a rail is wanted below, the usual method for a light table is to tenon the rails (H) to the legs. The shelf (J) is cut at the corners to fit the legs, and screwed to the rails from underneath. A section of this is shown at K.



Cabinet Making. Figs. 1-3. Diagrams illustrating some of the principal joints used in making a table and light bookcase.



Cabinet Making. Fig. 4. Details of carcass construction. Fig. 5. Diagrams showing details of door construction. See text.

When articles such us small bookcases, light sideboards, etc., are built with solid ends (Fig. 3), dovetail housing is adopted as the method of securing rigidity. A section of the dovetail housed joint is shown at A. In the case of the illustration sketched, the top of each end would be cut to enter a dovetail groove trenched in the top. The bottom shelf would be similarly dovetail housed to the ends, the joint in each case being stopped back about ¾ in. to mask it in front. The middle shelves might be plain housed, as adequate rigidity is secured by adopting the method of dovetailing at top and bottom. The shaped rail shown under the top and also below the bottom shelf is tenoned to the ends and glue-blocked behind.

Carcass Construction. The term carcass is usually applied to the framed box which forms the skeleton of articles such as wardrobes, cabinets, chests of drawers, and bookcases. Fig. 4 indicates the carcass of a small wardrobe. The carcass would stand on a framed base, as shown, and have a loose frieze and cornice above. The top and bottom of carcass are dovetailed to the ends, the latter being rebated for a framed back.

Large articles of furniture are often made up of two or more carcasses. A tall bookcase or bureau will have

separate carcasses for the lower cupboard and the upper case, whilst a three-door wardrobe will probably be made up in three carcasses. The back of an enclosed article is sometimes matchboarded, but more usually framed up. Lighter items are now frequently fitted with three-ply boards. In the case of heavy furniture of the sideboard type, corner posts are added. To these framed ends are housed, and in front the carcass is connected by means of rails, dovetailed or tenoned in as in the case of a table.

Doors for cabinets, wardrobes, bookcases and sideboards are framed up of stiles and rails, mortised and tenoned together and rebated for their panels. Except in the case of very small doors the thickness for stiles and rails is generally ⅞ in. net. Wardrobe and bookcase doors which have to carry glass will need to be heavier. The width of the framing varies from 1½ in. to 3 in., according to the size of door. At Fig. 5 (A and B) are shown the mortised stile and tenoned rail of a door. The tenon is indicated with a shoulder, as C, and the stile is, of course, mortised right through. For light doors the shoulder may be omitted; in heavier doors the tenon is usually wedged, as indicated by dotted lines at C.

In the case of a cabinet with double doors, the meeting stiles may have an applied astragal on the right-hand door, as D, or the stiles may be rebated to engage as E, a bead being run up the edge of the right-hand stile to soften the joint. On the best work an astragal is rebated in as F. Fig. 5 also shows some typical examples of door panelling. The plainest treatment is indicated at G, a flat frame, with the panel sunk not more than 3/16 in. At H the frame has a simple mould run in the solid. J, again, shows the frame rebated to take an applied moulding, whilst at K the treatment adopted for heavier doors is indicated.

Working drawings for a dining-room cabinet are given on page 318, and other articles to which refernce should be made are Bookcase, Bureaux, and Birds' Egg Cabinet. In the latter some leading features of cabinet construction are shown in detail, with large scale drawings.

CABINET PUDDING. For a hot pudding, well butter a plain mould and decorate the bottom with halves of glacé cherries. Break up about four stale sponge-cakes, and pack them loosely in the mould in layers, with a few chopped cherries or mixed candied fruits. Bring ½ to ¾ pint of milk to boiling point, and beat up 2 eggs; let the milk cool slightly, and then pour it gradually on to the eggs, stirring all the time. Add about 2 tablespoonfuls sugar and a few drops of vanilla or other essence to the custard, then strain it over the cake in the mould, not quite filling the latter. Let it stand for at least ½ hour. Cover the top of the mould with a piece of buttered paper, and steam it very gently for one hour. Turn it on to a hot dish and serve with it any good sweet sauce. If preferred this mixture can be baked.

For a cold cabinet pudding ornament the bottom of a plain mould with cherries and angelica, cover these with a thin layer of clear jelly, and leave it to set. Line the side of the mould with 3 oz. of Savoy biscuits, splitting the biscuits in half and arranging them alternately with back and front to the mould. Put 2 oz. of broken ratafias in the middle.

Next make a custard by beating up the yolks of 4 eggs—or, if preferred, 2 whole eggs—and addding ½ pint milk. Pour this mixture into a jug, stand it in a saucepan of boiling water over the fire, and stir until the custard thickens. Melt ½ oz. leaf gelatine in a little hot water and strain it into the custard. When cooled, add ½ gill of cream, with sugar and vanilla to taste. Mix all well together and pour it into the mould. When quite set turn it carefully out on to a glass dish.

CABRIOLE LEG. This carved leg found in certain styles of furniture has a projecting rounded knee at the top and a gradually tapering lower part, which is often carved with representations of a hoof, a shell, or an animal's paw grasping a ball. It is a feature of the Queen Anne style and was much used by Thomas Chippendale. In quite a different sense the word is used for a chair with upholstered back, arms, and seat, belonging to the Hepplewhite period. *See* Chair; Chippendale; Hepplewhite; Queen Anne.



Cabriole Leg. Late 17th century pattern.

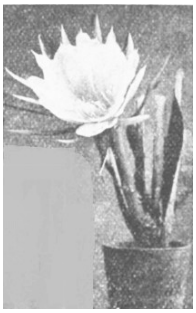
CACHOU. By this name is known a small sweetmeat with aromatic flavouring which is slowly dissolved in the mouth to disguise the odour of intoxicating liquors, tobacco, etc. For this purpose cachous are generally carried in a small box.

CACTUS: How to Grow. If the cacti are to be grown in a room, a very light and sunny position in front of a window should be selected. In a greenhouse plenty of air and the avoidance of a damp atmosphere will be most likely to result in success. The great thing is to get the plants to flower, as in almost all cases the blossoms are exceedingly beautiful. The chief points to be noted are: In the first place, never give a cactus plant a large pot—that is to say, always 1et it be rather small for the size of specimen. Secondly, begin to water the plants freely in April, but keep the soil rather dry in winter. Thirdly, in the hot summer weather let the cacti simply bake in the sun, in order that all the shoots may become well ripened.

Perfect pot-drainage is essential. Fibrous loam should form part of the soil, but nearly an equal amount of sand and brick rubbish should be added; moreover, each pot should be one-third full of drainage material. About April is the best time to carry out the potting of cacti. Raising from seed is a very slow process, and by far the quickest method of propagation is by cuttings. Practically any part of the stem will grow if the piece has been dried in the sun for

several days before being inserted in a mixture of loam, leaf-mould, and small crocks. The cuttings are potted up as soon as they are rooted. The following are the principal kinds of cacti:

Cereus	Mamillaria	Phyllocactus
Echinocactus	Melocactus	Pilocereus
Echinopsis	Opuntia	Rhipsalis
Epiphyllum	Pereskia	

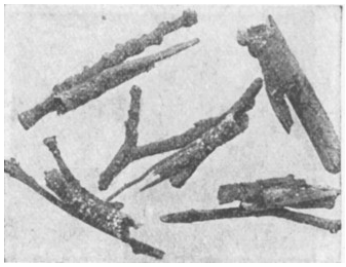




Cactus. Right, variety called Old Man's Cactus, Cereus senilis. Left, typical phyllocactus in bloom.

Most of the phyllocacti are very free flowering, and a splendid white-bloomed variety is albus superbus. The well-known red, so often seen in cottage windows, is also another useful kind of phyllocactus. The epiphyllums, many of which bloom in the autumn and winter, are very graceful subjects, being crimson, pink or white in colour. The genus cereus has amongst it some free-blossoming kinds.

CADDIS WORM. This insect is a very attractive inmate of the aquarium, owing to its habit of building a cylindrical case of sand grains, gravel, grass-stalks, small leaves, or snail shells, each species selecting particular materials. They are the larvae of the caddis fly. There are about 150 British species, the larvae being found in ponds and streams. Their long, pale bodies are soft, except the head, fore-body, and six legs, which have a horny skin. To prortect the soft hind-body they construct cases by uniting their building materials by silk filaments, with which also the tube is lined. These they drag over the bottom or haul up the stems of the water weeds, upon which they feed principally. Some species are carnivorous, and in the aquarium will destroy other aquatic insects.



Caddis Worm. Protective tubes made by these worms and attached to twigs.

When the larva is full grown it moors its case to weeds or stones, spins a silken web over each end of its tube, and changes to a nymph with free legs. Ultimately it leaves its case and climbs out of the water, throws off the nymph skin, and spreads the four hairy brown wings of the caddis fly. *See* Aquarium.

CAERPHILLY CHEESE. This cheese is considered to be specially suited to the needs of the underground workers. The most popular kind of Caerphilly is a cheese of the quick-ripening variety, available for consumption a fortnight to three weeks after manufacture. It is, therefore, of a perishable nature and deteriorates in quality after four to six weeks, becoming dry. This cheese is made from morning's and evening's milk.

CAFFEIN. Alkaloid found in the dried leaves of tea, in the dried seeds of coffee, and in other vegetable preparations. The dose in medicine is 1 to 5 grains. Preparations in common use are caffein citrate, dose 2 to 10 grains, and effervescing caffein citrate, dose 60 to 120 grains.

The chief action of caffein, whether taken as a drug or in tea or coffee, is to stimulate mental activity. All the faculties become on the alert, the imagination is keener, and thoughts work faster. It also wards off fatigue. If the dosing is continued, as in prolonged, excessive tea or coffee drinking, an overwrought state of the whole nervous system results. Caffein has also a marked diuretic effect on the kidney tissues, increasing the flow of urine. The drug is therefore much used in heart dropsy, and other conditions in which it is desired to deplete the body of fluids through the kidneys. The effervescing caffein citrate is frequently prescribed.

Caffein is frequently used in heart disease, either alone or combined with other heart stimulants, such as strychnia; or it may be used in the form of coffee. When phenacetin is prescribed for headache, caffein citrate, 2 grains, may be combined with 8 or 10 grains of the former, with caffein counteracting any depressing effect of the phenacetin on the heart, and also enhancing the effect on the headache. Caffein is recommended for asthma, 2 to 5 grains of the citrate being given at bedtime and again during the night.

CAIRNGORM. Semi-precious stone of the quartz family. It is largely used in the mounting of Highland dress accoutrements; also for jewelry, chiefly brooches and buckles, seals and beads. In colour it varies from a pale-sherry tint through all degrees of smoky brown to almost black.

CAIRN TERRIER. This is an extremely popular variety, being a keen, sporty little dog, and one that is particularly suitable for living within the family circle. Apart from this it is used for ousting foxes from rocky cairns where a bigger dog could not go. Consequently he requires a strong muzzle for his size. A fair average weight is about 14 lb., but the tendency is towards a smaller breed.



Cairn Terrier, a small sporting dog.

The cairn is a short-legged, compactly built little dog with a rather foxy head, alert eyes, and small, pointed ears. The tail is carried gaily.

The outer coat is wiry and hard, and there should be a good under coat. The colour may be sandy, grey, brindled, or nearly black. Dark ears and muzzle on the lighter colours are appreciated. Eyes are dark hazel. *See* Dog.

CAKES AND HOW THEY ARE MADE

General Directions about Materials and Methods

Further details will be found under the heading of various cakes, e.g. Dundee; Genoa. See also Baking; Decoration; Icing.

Cake mixtures may be conveniently divided into four main groups: (a) Plain cakes, in which butter is rubbed into a relatively large quantity of flour; (b) Richer cakes, in which the sugar and butter are creamed (i.e beaten to a cream) and flour and other dry ingredients added subsequently; (c) Sponge mixtures, which contain no butter, and (d) Gingerbreads, in which the butter, sugar, and syrup (or treacle) are melted together and poured into the dry ingredients.

Recipes covering each group are given below. Variations of these proportions and methods may be preferred by some cooks, but the examples given have been found satisfactory in practice. It is to be understood that wherever butter is mentioned, margarine may be substituted if desired, or for fruit cakes, a mixture of lard and butter.

Plain Cake Mixtures. A very plain mixture, suitable for an ordinary round cake or for small cakes (12 to ½ lb. flour) may be prepared as follows: Rub 3 oz. butter into ½ lb. flour. Add ¼ lb. sugar and either ¼ lb. currants or a teaspoonful of caraway seeds. (Alternatively, ½ teaspoonful of vanilla essence may be added after the egg and milk). Beat one egg, add to it rather less than a gill of milk, mix dry ingredients, put into a greased cake tin and bake one hour in a moderate oven. The 12 small cakes require 20 to 25 min. in a quick oven. By using ½ gill only of milk, a good rock cake mixture is obtained.

Another good cake of this type is called Bachelor Cake. To make it, add a teaspoonful of baking soda to ¾ lb. of flour. Then rub in 3 oz. butter. To the mixture add ½ lb. sugar, ½ oz. each of cinnamon, allspice, and ginger, ½ teaspoonful of salt, 2 oz. chopped mixed peel, 2 oz. blanched and shredded almonds, 1 oz. caraway seeds, ½ lb. washed and dried currants, ¼ lb. stoned raisins, and enough buttermilk to make the mixture into a moist dough. After beating for 20 min. place the dough in a greased tin, and bake for about 1 hour in a moderate oven.

Richer Cakes. A good sultana cake (Fig. 1) can be prepared as follows: Cream ½ lb. butter with 6 oz. castor sugar. Add gradually and alternately 1 lb. flour and a teaspoonful baking powder and four well-beaten eggs. (If self-raising flour is used no bakingpowder is required.) Stir in a gill of milk, a pinch of salt and either ¾ lb. sultanas or ½ lb. sultanas and ¼ lb. finely chopped candied peel and beat thoroughly. Put mixture into a tin lined with greased paper and bake from 1½ to 2 hours in a rather slow oven. If a metal skewer inserted into the cake comes out dry, the cake is done.

A rather more elaborate cake of this type is known as Angel Cake. To make it, cream 4 oz. butter with 4 oz. castor sugar, add 2 well-beaten eggs and sift in ½ lb. flour mixed with 1 teaspoonful baking powder. Add ¼ lb. sultanas, 2 oz. each of preserved cherries (quartered) and chopped preserved pineapple. Mix well, and if the mass seems too dry, soften with a little milk, but be careful not to make it too moist. Stir in a few drops of essence of lemon, place in a cake-tin lined with well-buttered paper and bake in a moderate oven about for about 1½ hours. The success of this cake depends on the thorough beating of the eggs and the gentle mixing of the flour.



Cake. Fig. 1. Good sultana cake, a recipe for making which is given in the adjoining column.

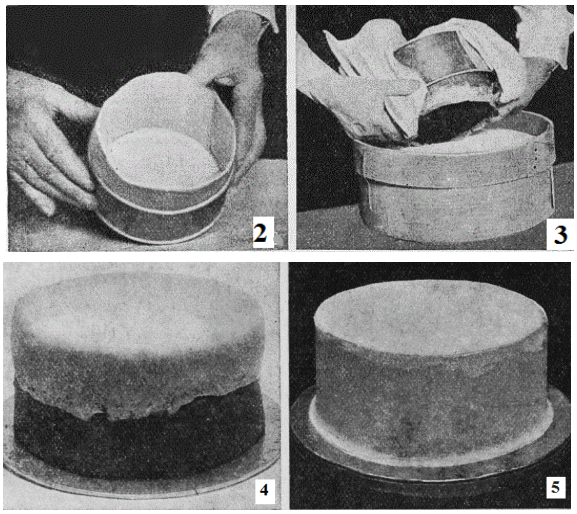
A very rich cake, suitable for Birthday or Christmas Cake, can be made, iced and decorated, as follows: Line a large cake-tin with greased paper (see Fig. 2), and then put ½ lb. butter in a warm basin, beating it with a wooden spoon to a soft cream. Add ½ lb. sugar, creaming the two ingredients together until they resemble whipped cream. Beat four eggs to a froth, stir them gradually into the mixture, and beat well. Sieve ¾ lb. of flour, half a level teaspoonful of salt and two teaspoonfuls of ground allspice, adding these lightly to the whole.

Mix together 6 oz. currants, 6 oz. sultanas, 1 oz. glacé cherries (quartered), 6 oz. mixed chopped peel, 2 oz. shredded blanched almonds, and the grated rind of a lemon, afterwards stirring them into the other ingredients. Pour in 1 gill milk and 4 tablespoonfuls brandy, turn mixture into cake-tin, and smooth the surface quite level, using a knife dipped in hot water. To prevent the cake from burning underneath, a layer of salt or sand about an inch thick may be put in the bottom of the baking tin, and covered with greased paper. Then bake the cake in a moderate oven for about 2½ hours, and turn out on to a sieve *(see* Fig. 3).

When it commences to brown, lay a piece of thick paper over the top, letting it rest on the edge of the band that stands up above the tin. When cold, cover top of cake first with almond paste (q.v.) and then with royal icing (Figs. 4-5), and decorate it with caramelised fruits. The latter are prepared by boiling ¾ lb. of loaf sugar in a saucepan containing sufficient water to moisten it, and stirring it over the fire until it becomes golden-brown in colour, and adding a few drops of lemon-juice. Take some greengages and apricots, cut into halves, and some whole grapes; dry these

thoroughly and drop them into the caramel mixture immediately after it has ceased to boil. When well coated, put the fruits carefully aside to dry, and then arrange them on top of the cake. Instead of the fruit decoration, sugar flowers may be used, made with an icing tube, and coloured (Fig. 6).

For a child's birthday cake, candles in tiny holders, the number denoting the age of the child, may form part of the decoration.

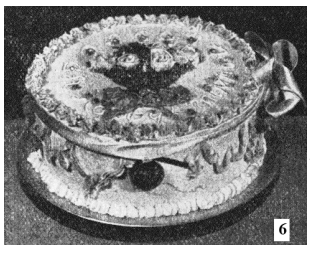


Cake: stages in making a rich cake. Fig. 2. Cake-tin greased and lined with paper. Fig. 3. Turning the baked cake on to a sieve to cool. Fig. 4. Almond paste spread on top. Fig. 5. Cake covered with hard white icing.

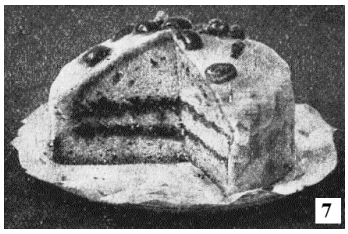
The necessary ingredients for royal icing are 2 lb. of icing sugar, 4 whites of eggs, and the juice of 2 lemons. Rub the icing sugar through a hair sieve into a basin, make a well in the centre, and put in the slightly beaten white of egg. Mix in a little of the sugar from the sides, then add half the strained lemon juice, and mix the whole to a rather moist paste, adding more lemon juice as required. If the lemons are large, all the juice may not be needed. Use the icing at once, smoothing it over with a large knife, dipping the latter in cold water occasionally.

Rich cakes should always be made a month or more before they are required for use; they should be packed (when cold) in several layers of greaseproof paper and kept in a dry and airtight place.

A Madeira mixture may be prepared as follows. Take 3 eggs and their weight in sugar and self-raising flour and the weight of 2 eggs in butter, and flavouring to taste. Cream butter and sugar, add eggs and flour gradually and alternately, stir in flavouring essence and beat very thoroughly. Put mixture in a cake-tin lined with greased paper and bake at once in a moderate oven from 1½ to 1¾ hours.



Cake. Fig. 6. Final stage in making a rich cake: the finished cake decorated with ornamental flowers in icing.



Cake. Fig. 7. Layer cake with jam filling, the top iced and decorated with walnuts and glacé cherries.

To make layer or sandwich cakes use 2 eggs and their weight in butter, sugar and self-raising flour and mix as for Madeira cake. Bake layer cake (Fig. 7) for about 1 hour in a rather slow oven. For Sandwich Cake, or Victoria Sandwich, divide mixture into two equal parts and bake in sandwich tins (greased and floured) for about 15 min. in a brisk oven. Layer cake should be cut through twice and spread with jam (preferably raspberry or apricot) or with whipped cream, sweetened and flavoured as desired. One excellent filling is made with minced Brazil nuts and sweetened whipped cream. A simple icing can be made by heating (not boiling) 1 lb. icing sugar with rather less than a gill of water and a teaspoonful of the desired flavouring. Pour over cake while warm and ornament with glacé cherries and walnuts or angelica.

Sponge Cake Mixture. One way of preparing this is to take 2 or 3 eggs and their weight in sugar and flour. Whisk eggs and sugar for about 15 min. and fold flour in lightly and thoroughly. Have ready a tin lined with buttered paper and sprinkled with sugar, put mixture in at once and bake in a brisk oven for about ¾ hour. For jam sandwich, divide mixture into two parts and bake in sandwich tins. This should take about 15 min. in a brisk oven. It is very important that this mixture should be made quickly and put into oven at once, and that oven door should not be opened until it is nearly done.

Gingerbread. A good plain gingerbread is prepared as follows: Melt ¼ lb. sugar, ½ lb. margarine, and ¾ teacupful of golden syrup in a saucepan over the fire. Beat up 2 eggs. and when the melted syrup is cool, add them to it and beat all together. Sieve together 1 lb. flour and 2 teaspoonfuls of ground ginger, make a well in the centre, and into it pour the syrup etc., mixing and beating the whole thoroughly.

Dissolve ½ flat teaspoonful bicarbonate of soda in ½ gill of milk, mix it with the other ingredients, and turn the mixture into a greased cake-tin. Bake the cake in a moderately hot oven for 1 to 1½ hours, then turn it on to a sieve and leave until cold.

The temperature of the oven should always be fairly high before cakes are put in. In a gas oven the burners should be left full on for about 10 min. previously and turned down about half way when cake is put in, i.e. rather less than half way for a 'brisk' oven and rather more than half way for a 'slow' oven. The oven door should not be opened for at least 20 min. after a cake has been put in, and when baking sponge cake, not until cake is likely to be done. The oven, it is to be noted, should be hotter for small and light cakes than

for fruit cakes.

To make a cake level for icing, a slice is sometimes cut off the top and cake turned upside down; but if mixture be kept higher at sides of tin than in the middle before putting in oven, the necessity for this is obviated to a great extent. Another method is to place a sheet of paper lightly across the side lining paper (which should always be higher than tin) as soon as cake has risen and browned slightly.

CAKE STAND: How to Make. Silver or plated silver stands having two or three tiers, and fitted with china or glass plates, are useful for the table.

Floor cake stands vary from 2½ to 3 ft. in height, and are made in metal and wood. Some of these fold up into small compass and have two or three tiers. To match the furniture of the room, stands are made of walnut, plain and inlaid mahogany, fumed oak, and other less expensive woods. One of the handsomest is made of black mahogany inlaid with English gilt, and having a pagoda design. Other Chinese designs are introduced on lacquered stands in colours to suit the scheme of the room.

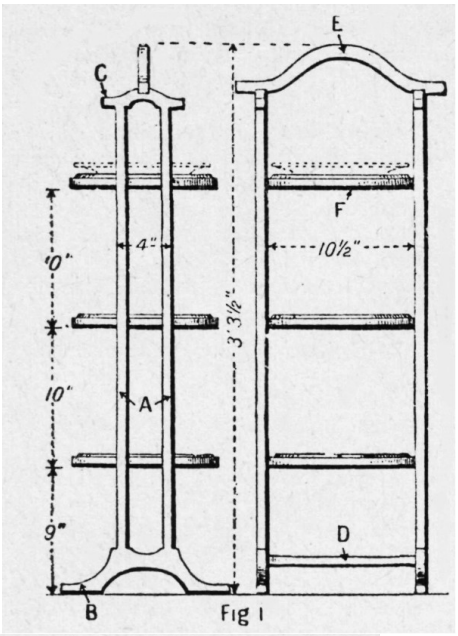


Fig 1

Cake Stand. Figs. 1-4. Three-tier floor-stand, and diagrams giving full details for making the various parts and fitting them together.

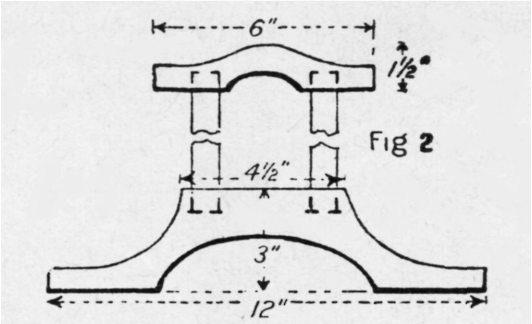


Fig 2

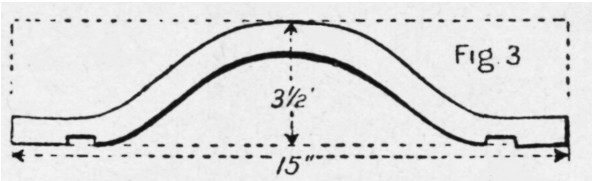


Fig 3

A three-tier cake stand is shown in Fig. 1. There are three shelves carried by side framework, which is provided with suitable feet at the bottom. The framework is connected by a crossbar at the bottom and a handle at the top. The wood selected should, if possible, match the surroundings in which the stand will be placed, oak (fumed and wax polished) or any of the polished cabinet woods being suitable.

The dimensions given in the diagrams are suitable for china plates about 9½ in. in diameter, so that, if larger or much smaller plates are to be used, the dimensions given should be altered accordingly. The framework at each side consists of two uprights (A) which are 2 ft. 9 in. long by ¾ in. square; a foot (B) and a top rail (C), which are cut from wood ¾ in. thick to the shape and dimensions shown in Figs. 2 and 3. The uprights are tenoned into the feet and top rails, as shown at Fig. 2, the length of the uprights between the shoulders of the tenons being 2 ft. 7⅝ in. The bottom crossbar (D) is 11½ in. long by ¾ in. thick. This bar is tenoned into the feet (B), the length between the shoulders of the tenons being 10½ in. The handle (E) is shaped as shown at Fig. 3 from wood ¾ in. thick. It is notched ⅛ in. over the top rail (C) and is fixed with screws driven through the rails. This completes the construction for the framework.

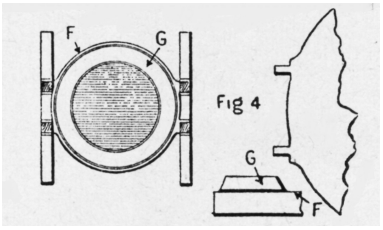


Fig 4

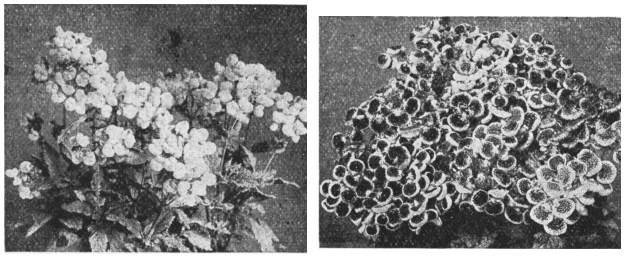
The shelves (F), are cut from wood ½ in. thick, and tenons similar to those shown at Fig. 4 are formed at each end for framing into the uprights (A). A rim (G) is fitted above each shelf to keep the china plates in position. These rims should be cut from wood ¼ in. thick. They stand ¼ in. in from the outer edges of the shelves, as shown at Fig. 4. The inner diameter of the rims must be large enough to fit the rims at the bottom of the plates, which will probably be about 6 in. The edges of the rims could be bevelled as shown. The rims are glued to the shelves. It is usual to cover the shelves inside the rims with baize. In fixing the stand together all joints should be glued.

CALAMINE. This is another name for native zinc carbonate, and prepared calamine, which is used in medicine, is got from it by crushing and pulverising. The common calamine ointment, which is much used in inflamed conditions of the skin for its slight astringent effect, is prepared by mixing one part of calamine with five parts of benzoated lard. Calamine may also be used as a lotion.

CALANDRINIA. The annual kinds may be sown under glass in March or out of doors in April; they need well-drained soil and a sunny spot. Grandiflora (18 in.), rose, and speciosa (9 in.), crimson-purple, should be grown. Umbellata has magenta flowers.

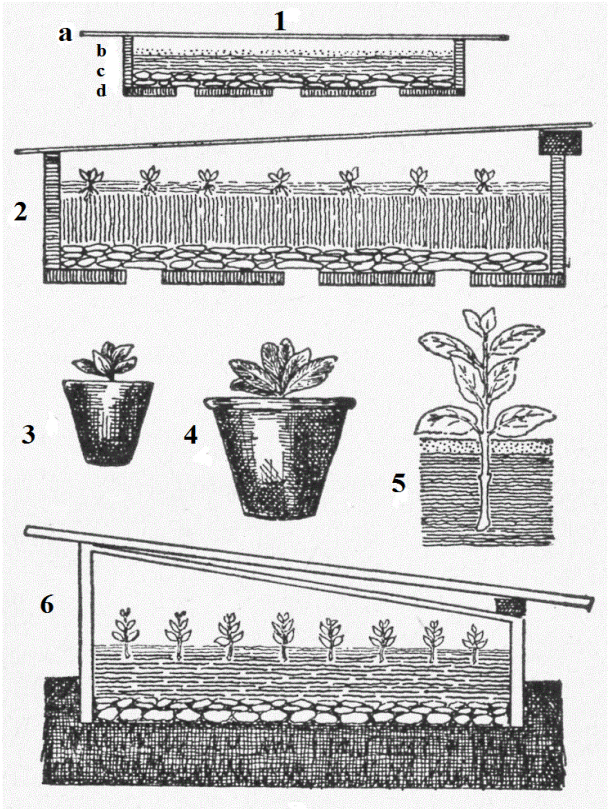
CALCEOLARIA. The herbaceous calceolaria is

grown in pots for greenhouse decoration in May and June; the flowers are brilliantly coloured and make a striking display. Seeds are sown in May and June in pots of finely sifted sandy soil, and the plants are grown in a cold, shady frame during the summer. In autumn they are placed in the greenhouse, a temperature of 45 to 60 degrees being suitable.



Calceolaria. Left, clusters of the Golden Gem variety; right, profusely flowering herbaceous calceolaria.

The dwarf shrubby calceolaria, in yellow, bronze and other shades of colour, is a favourite summer bedding plant; it is not quite hardy except in warm, sheltered places, and is propagated by cuttings set in boxes of soil in a frame in September. Planting is done in May. Golden Gem is a favourite variety. There are several charming small-flowered calceolarias which are invaluable for the greenhouse in summer; chief among them are integrifolia, amplexicautis, Burbidgei, and Clibrani. The John Innes strain of calceolaria provides plants 18-24 in. high, which bear small flowers in many colours. The shrubby kinds are increased by cuttings taken in late summer, the others from seeds sown in May.



Calceolaria. Diagrams illustrating the method of raising these plants from seed and cuttings. See text.

The seed is very small and, in the case of choice varieties, is expensive. The compost is of loam, peat and silver sand placed in a box on a layer of broken crock, as shown in c and d, Fig. 1 and moistened by sinking the box in water. The seed is spread over the surface and covered with a little of the finest silver sand, as in b, Fig. 1. The box in kept in semi-shade in the greenhouse covered with a sheet of glass, as in a, Fig. 1, and when the plants are up they are removed to a frame, as in Fig. 2, kept there until well rooted. They are potted when the leaves are about an inch long, as in Fig. 3, and later transferred to a flowering pot, as in Fig. 4. A good mixture is one part each of loam and decayed hotbed manure to half a part of silver sand. Propagation of the shrubby varieties is by cuttings taken late in autumn with long heels sliced almost perpendicularly from the parent plant, as in Fig. 5, and inserted in a cold frame, Fig. 6.

The frame is kept closed for a few weeks to help the cuttings to form roots. During the late autumn and winter months it is necessary to ventilate the frame freely in mild weather and water must be given sparingly.

CALCULUS. A stone-like concretion known as calculus is found in the human body, especially in cavities which act as reservoirs. Thus, in the gall bladder, biliary calculus or gall stone occurs; in the pelvis of the kidney, renal calculus; in the bladder, vesical or urinary calculus.

The material of which a calculus is composed is frequently found to have gathered round a nucleus, e.g. blood clot, dried mucus, or a small foreign body. Such a concretion may give rise to few or no symptoms until it begins to make its way down the duct which empties the reservoir, when it may cause excruciating pain, as in biliary and renal colic. It may become stuck or impacted in the duct. *See* Gallstone; Kidney, etc.

CALENDARS FOR HOUSEHOLD USE

Examples that are Easy to Make and Useful

Bent Iron Work; Passe Partout; Stencilling are among the entries that those interested in making a calendar may consult with advantage

A calendar is quite simple to make. The necessary material, in the shape of cardboard or suitable paper, having been obtained, all that is necessary is to take a copy of the calendar for the previous year, and to move back all the dates by one, except for a leap year, when they must be altered by two. Thus the Sundays in January, instead of reading 4, 11, 18, 25, will read 3, 10, 17, 24. This done, with any elaborations that taste suggests, it may be mounted on to a piece of cardboard, wood, or leather,

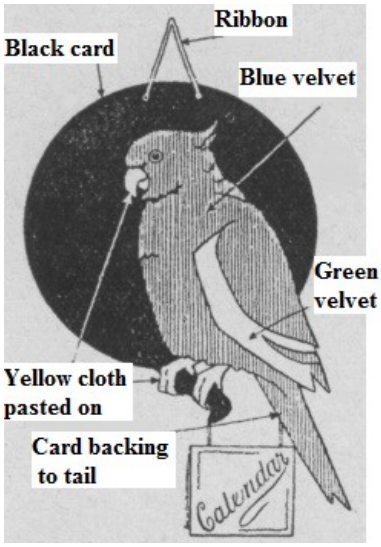
Gift calendars are easily made by children on tinted mounting boards, which can be obtained in various sizes. One, 10 in. by 8 in., can be decorated with stencilling. A very pretty design is arranged so that room is left to fix a small tab calendar after the stencilling is completed. Appropriate stencils—a blue bird, a

squirrel, a ship, etc.—can be bought to be used with watercolour, and a small Jap brush. An alternative is to paste a photograph or a coloured print—outlining either with a black or coloured border, put in with pen or brush—on the mount. A smaller mounting board may be used and a booklet calendar fixed by two short lengths of narrow ribbon to hang below the board. A strip of firm paper should be pasted at the back of board and booklet in order to hold the ends of the connecting ribbons in place.

Stencils may be used on coloured suède. Take a piece about 7 in. by 3 in., place it on a flat board and stencil, on the suède side of the leather, the small design chosen. Mandarin inks or liquid stencil colours may be used. A border is painted or inked round the piece of suède, and appropriate words written, with the same colouring material, above the tab calendar. A hole is punched in the top of the suède through which a narrow ribbon is threaded to form a loop at the back and tied in a small bow in front. The lower end of the calendar may be fringed or the corners trimmed.

Lucky black cats, squirrels or birds, may be cut out of velvet and pasted on cardboard mounts cut to the shapes of the animals. A paper pattern should first be made by the help of a transfer. Glass beads may be used for eyes, fastened by wires at the back, the visible ends of the wires being covered with a dab of black paint to form the pupils of the eyes. The calendars can be gummed on the animals. Original designs can be drawn on the cardboard trom which to cut the velvet.

A popular form is the slip-in mount which takes enlarged photographs.



Calendar. Fig. 1. Diagram showing how a bird calendar can be made from velvet and cardboard.

A calendar on which the figure of a bird is the main feature is shown in Fig. 1. A piece of cardboard is cut into a circle except for an extension at the bottom, as shown in the illustration, and is painted black. The figure of a parrot is then outlined, the upper part being on the circle, while the tail part, which is below it, is fitted with a backing of cardboard. A piece of blue velvet is pasted on to the figure, except that in one place, as shown in the diagram, a piece of green is substituted. The bird is apparently supported on a bough, round which claws, also of cardboard, must be cut, and these should be covered with yellow cloth. Finally the calendar proper can be hung on to the tail, and the whole suspended by a ribbon. Following the same design, other colours and figures can be used.

Perpetual Calendars. A perpetual calendar is illustrated in Fig. 2, details of construction being given in Figs. 3, 4, and 5. The work is simple; the side pieces are grooved to receive the front and back, the former being cut out and glazed. The top and base can be cut from the solid or built up from several layers.

The rollers are shaped as shown, and carry the linen band on which are marked the numerals 1 to 31. The upper and lower rollers have the names of the months and the days of the week respectively marked upon them. The work is completed by staining or polishing.

Another perpetual calendar is introduced into a linen sampler embroidered in cross-stitch, as seen in the illustration, Fig. 6, with a diagram, Fig. 7, showing back of calendar.

First take the strips of ribbon to match the colour of linen used and trace with a pencil on each, very neatly,

the days, dates and months. Outline these in black silk. Next draw the design on the linen and embroider the sampler in cross-stitch (q.v.), using delicate, old-world pinks, blues and greens. The little lady has yellow hair, pink and blue dress, yellow and green flowers. Blue French knots form her eyes and her face and arms are outlined in pale pink. The zig-zag design is in black, pinks, blues and yellows. The slots for the day, date and month are first buttonholed and then cut so that the strips may be inserted. The sampler is backed with cardboard, slots being cut exactly to correspond with those in front to allow the strips to be moved round. Join each strip to make a ring at the back *(see* diagram) and frame in a passe-partout frame.

Fig. 2.



Calendar. Figs. 2-5. Perpetual calendar in box form, with explanatory working diagrams.

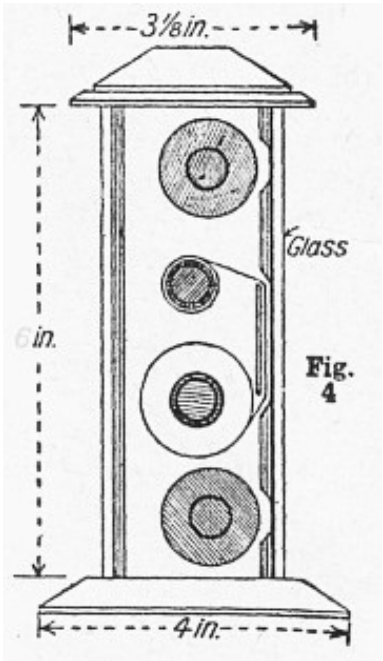


Fig. 4

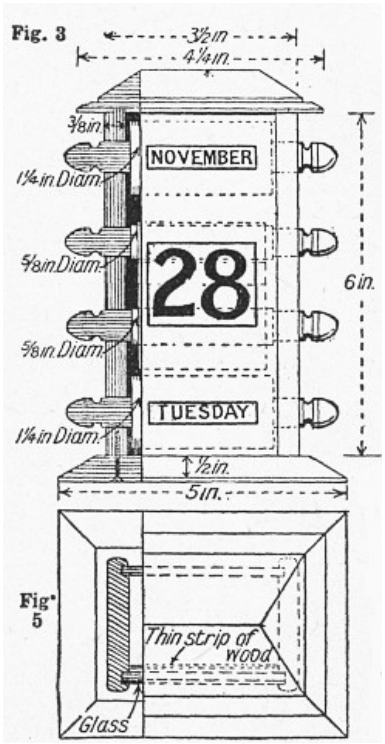




Fig. 6. Perpetual calendar on an embroidered sampler in cross-stitch.

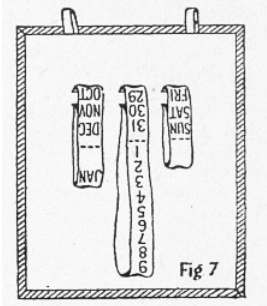


Fig. 7. Back of calendar.

CALF. The flesh of the calf is known as veal, and is a very delicately-flavoured white meat. The brains, head, heart, tongue, liver, sweetbread and kidneys of the calf are also used for the table, while jelly is made of the feet. The tongue, liver, and kidneys are smaller, more tender and delicately flavoured than those of the bullock, but the method of cooking them is practically identical. *See* Brains; Liver; Sweetbread; Veal.

CALF: The Leather. If the pelt is to be turned into old-fashioned calf leather it is tanned by steeping in an infusion of bark or other vegetable produce containing tannin. The leather, according to methods of finishing, will be either calf for boot uppers, gloves, etc.

There is another process of dealing with the pelt, and that is by immersing in a bath of chromium salts, which produces chrome leather. This may be finished black, when it becomes box-calf, or a shade of brown or yellow, known as willow calf.

Another finish is velvet calf. In this process the natural grain is carefully removed in the buffing machine, leaving the surface with a fine velvety nap. In wax calf the finish is on the flesh side, and the grain or outer surface of the skin becomes the inner surface. This is employed for heavy boots, for shooting, fishing, and for agricultural boots. It is said to withstand the effect of stable and field wear better than chrome leather.

Calf uppers of heavy boots should be freed from all dirt and thoroughly dried after use. They should be treed to preserve the shape, and before wear given an application of dubbin if the weather is wet, or of good blacking if it is dry.

Patent calf is perhaps the most reliable patent leather that can be purchased. This is perfectly waterproof, and here again to assist the patent surface to be maintained it should be fed occasionally with a little castor oil lightly rubbed over and then wiped dry with a soft rag.

Russia leather owes its characteristic odour to the birch bark with which it is tanned. Like most other fine leathers, the original has been imitated, and much of the so-called Russia leather is tanned with other materials, and then scented with birch tar oil.

In dressing calf a certain amount of acid is absorbed which has to be removed by washing. When the leather is required for bookbinding this elimination has to be very thorough, otherwise the acid will in course of time cause the leather to deteriorate and rot away. *See* Boot; Leather.

CALF'S FOOT JELLY. Wash 2 calf's feet thoroughly in boiling water, chopping each into 4 pieces. Put these into a saucepan with cold water to cover them, and allow them to boil for 5 min. Lift out the 2 feet, throw away the water, and replace the feet in the saucepan with 5 pints of hot water, boiling it gently for 5 to 6 hours and keeping the stock well skimmed. By this time the liquid will be reduced to about 1 quart. Strain off, let it get cold, when it will be a jelly, and then remove grease from the surface, finally wiping it with a clean cloth dipped in boiling water.

Turn the jelly into a clean pan, add ½ pint of sherry, 6 oz. loaf sugar, the thinly-pared rind and strained juice of 3 lemons, 3 cloves, 1 in. of cinnamon, and the washed, crushed shells of 2 eggs and their lightly-whisked whites. Whisk all these ingredients over a moderate heat until the jelly boils up to the top of the pan. Let it sink again and reboil it. Do this twice; then allow it to settle for 10 min. by the side of the fire, keeping it covered. Strain it into a basin through a clean, coarse tea-cloth kept solely for this purpose, first scalded by pouring boiling water through it. Pour the jelly back again through the cloth two or three times if at all cloudy. Next pour the clear jelly into a wet mould, or moulds, and leave till set.

It is wise to test the stiffness of this jelly by cooling a little of it quickly. If too stiff add a little more sherry, water, or lemon-juice. If wished, omit the wine and use more water and lemon-juice, or add brandy or port

wine in place of sherry. If a clear jelly is not required leave out the shells and whites of the eggs, and after boiling the jelly for a few minutes, strain it through a hair sieve or a fine strainer. This is sufficient for about a quart of jelly.

CALF'S HEAD. Wash the head thoroughly and trim, making sure that the eye, the inner part of the ear, and all the soft, bony parts from the nose have been removed. Leave it to soak in cold, salted water for 2 hours; then lay it in a saucepan, with enough cold water to cover it, and boil it for 10 min. Throw away this water, put back the head with fresh water, and add 1 onion, 1 carrot, 1 turnip, and a few sticks of celery, all cut into small pieces, a small bunch of herbs, 6 peppercorns, 2 cloves, and 3 allspice, the last named being tied up in a small piece of muslin.

Let all these simmer for 3 to 4 hours, or until the meat is perfectly tender and comes away from the bones. Skim the stock well, lift out the head on to a hot dish, and serve whole with hot maître d'hôtel sauce poured over. Alternatively, cut the meat off the bones into large, neat pieces, arrange on a hot dish and pour over the sauce, garnishing the bead with sippets of toast and cut lemon.

Another way of treating calf's head which has been boiled is to cut it into slices ½ in. thick, sprinkling the pieces on both sides with grated nutmeg, flour, and salt. Fry these a light brown, then put each piece into a stew-pan. Mix a teaspoonful of flour with a little water till smooth and add it to the butter in which the head was fried, afterwards pouring in gradually ½ pint stock together with a wineglassful sherry and a tablespoonful Worcestershire sauce. Season the whole with a little cayenne and a tablespoonful lemon-juice, pour the sauce over the meat, and let all simmer for a quarter of an hour.

Calf's head is often served with tomato sauce. This dish is made from a boned, cooked head, about ½ pint tomato sauce, and ½ lb. macaroni. Divide the macaroni into pieces about ¾ in. long, and boil rapidly in salted water until tender. Cut the meat into small slices, pour the tomato sauce into a stewpan, and add to it the strained macaroni and the meat. Season it to taste, and heat thoroughly. A calf's head makes a good brawn, and mock turtle soup can also be made with it. *See* Brawn; Mock Turtle Soup.

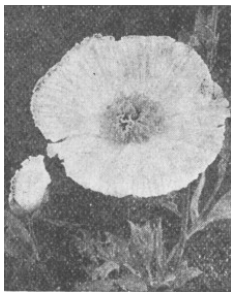
CALICO. The name is derived from the Indian port of Calicut, from which a large part of the calicoes worn in the western world used to be shipped.

What makes one calico better than another is the quality of the raw cotton used to begin with, the fineness of the threads from which it is woven and the number or closeness of those threads. Cotton cambrics, jaconettes, long-cloths and madapolams are included under this heading. Calicoes may be bleached, unbleached, or partly bleached, or printed, by machine or hand, in most colours. *See* Cotton.

Californian Bluebell. *See* Nemophila.

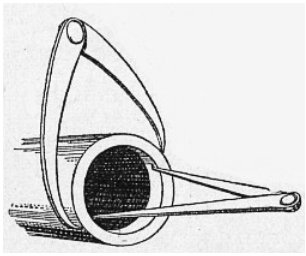
CALIFORNIAN POPPY. The eschscholtzia, or Californian poppy, is commonly seen bearing deep orange flowers with a yellow margin; but there are also white, pink and red varieties. Notable varieties are the white or alba; semi-double orange or flore pleno; Mandarin, which is orange shaded red; Rose Queen; Ruby King; Rose Cardinal, a creamy rose; Mikado, crimson; Geisha, which is orange scarlet; and Monarch art shades.

This showy annual is raised from seeds sown in the open in spring and autumn, and the seedlings thinned to about 9 in. apart. A light, friable soil and a sunny site are most suitable. In many gardens self-sown seedlings are numerous.



Californian Poppy. Flower of the Californian Tree Poppy, Romneya.

CALIPERS: For Measuring. These instruments are generally made of metal with firm joints; that is, the joint is so constructed that the calipers, when set to any given measurement, will not readily be displaced. They are made in various forms, those shown here being from 3 in. to 24 in. in length. The outside calipers are pear-shaped and adapted for measuring the diameter or thickness of a rod or bar. The inside calipers, used for measuring the bore of a tube or the diameter inside a ring, have outwardly turned ends or jaws.



Calipers. Diagram showing how they should be used for making inside and outside measurements.

The method of using is illustrated. It it essential for accurate measurement that the calipers should be held erect and the jaws kept at right angles to the axial line of the work. Inside calipers are held in a similar manner, with the centre of the joint on the axial line of the bore of the work. The distance outside the jaws is then compared with a ruler to obtain the dimension. In the case of outside calipers the dimension inside the jaws is taken. Improved calipers for very fine measurements have a screw adjustment. Spring calipers can be easily and quickly adjusted with considerable accuracy, by means of the screw nut. Thread calipers for measuring the diameter of screw threads have extra wide jaws, while odd leg or jenny calipers are for scribing the centres on a bar or for other marking out and measuring purposes.

CALL: How to Pay. In the country and smaller towns it is customary for the older residents to call first upon newcomers. They may call because asked to do so by a mutual friend, or, quite correctly, as an act of courtesy, without introduction. If invited to meet the newcomer at the house of a friend, they would be

almost bound to call at an early opportunity, unless they wish to slight both friend and newcomer.

This rule is obviously impossible in the larger towns, and therefore a newly arrived person has to take the initiative in such matters. She will usually have some kind of social introduction to one or two people, and will duly leave cards on them, or should her social circle be very large, she may send her secretary to leave cards. In India and most of the British dominions and dependencies this also applies. The newcomer will leave his or her card on the residents (as a rule the card is merely put into the letter-box or into a special box for the purpose fixed to the gate of the drive) and will write his name in the book at Government House, and such as desire the acquaintance will then take steps to improve it.

Leaving Cards. Usually the time for calling is from 3 to 6 p.m., from 3 to 4 being the most formal hour for mere acquaintances. When the lady called on is not at home, the caller should leave one of her own cards, and if married one or two of her husband's, one of his being for the lady of the house and the other if she is married for her husband. After a first call it is usual to leave only one of the husband's cards.

"Not at home" is often a polite formula, and may mean that the lady of the house is in but is not receiving. This must not be taken as a slight, and the caller, unless on very intimate terms with the mistress, should not ask any questions of the servant, but leave her cards. A man should not call on a lady unless she invites him to do so. It is usual for men to leave their hats and sticks in the hall, and not take them into the drawing-room.

The caller should not present cards to a servant when the mistress is at home, but should follow to the drawing-room door, where the name should be given, if unknown, to the servant. After shaking hands, the visitor should sit down near the hostess without waiting to be asked.

A formal call should only last about a quarter of an hour. It is usual to offer tea, but the offer is not usually accepted unless tea is already being served in the room. Women do not rise when other visitors are introduced unless they wish to show particularly courteous attention. A man would get up at the same time as his hostess, who always rises to greet a visitor of either sex. The same rule applies when a guest is leaving.

Etiquette of Introduction. When introducing, a man must always be introduced to a woman, whatever their respective rank or position, and, in the case of people of the same sex, the less important is introduced to the more important. An unmarried lady is always introduced to a married one, unless the former is of superior rank. The rule is to bow only on being formally introduced, but this is not usually adhered to if the people are introduced by the hostess as personal friends of her own, when it would seem frigid not to shake hands. If people have only bowed they do no usually shake hands, but bow again, at parting. Cards should be left or a call returned within a week or ten days. *See* At Home; Etiquette.

CALLIOPSIS. The daisy-like flowers of the calliopsis (or coreopsis) are orange, yellow, crimson, and brown, growing on stems 1½-2 ft. high. The annual varieties are sown out of doors in March-April, where they are to bloom in summer. Several kinds are perennial, but as they are liable to perish after having flowered it is wise to sow seeds annually in June; the best are auriculata superba, grandiflora and lanceolata, all three bearing yellow flowers.

CALL SIGN. In wireless telegraphy this is an identification signal by which a transmitting station may be readily recognized, thus facilitating the transmission and reception of messages in Morse code. Call signs are also used by broadcasting stations.

CALOMEL. Calomel or mercurous chloride is a white, practically tasteless powder frequently used in medicines for its purgative action. It also acts as an intestinal antiseptic. Calomel is usually given at night, dose from one-half a grain to 5 grains, when the constipation is accompanied by headache, heavily coated tongue, and feeling of fullness in the pit of the stomach.

A saline such as Epsom or Carlsbad salts or black draught (compound mixture of senna) is usually given in the morning following. It clears away bile from the gall bladder. In various forms it is used in syphilis; combined with glycerin and solution of lime it forms black wash, which may be used as a lotion for sores of this complaint. It may be applied as a dry powder to relieve itching.

Calomel, the mercurous chloride, should not be confused with corrosive sublimate, or mercuric chloride, which is much more poisonous. *See* Black Draught.

CALUMBA. The dried root of the calumba plant, which is obtained in E. Africa, is used for medicinal purposes, being a bitter stomachic, increasing appetite and aiding digestion. As it contains no tannin it does not form a black, inky mixture with iron, in this way resembling quassia. Useful preparations are the infusion, which is made with cold water, dose ½ to 1 oz., and the tincture dose ½ to 1 dram. In anaemia the following may be given, a tablespoonful being taken in water thrice daily after food:

Citrate of iron and ammonium	1½ drams
Tincture of calumba	6 drams
Syrup of ginger	4 „
Water up to	6 oz.

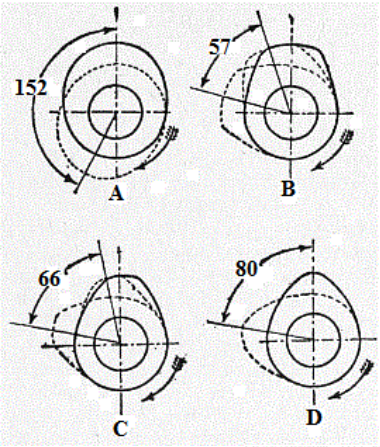
As another illustration of the use of calumba in medicine, the following may be given to increase or stimulate the appetite, the dose being one tablespoonful in a wineglass of water, taken thrice daily just before food:

Nitrohydrochloric acid (dilute)	3 drams
Syrup of oranges	4 „

Infusion of calumba up to	6 oz.

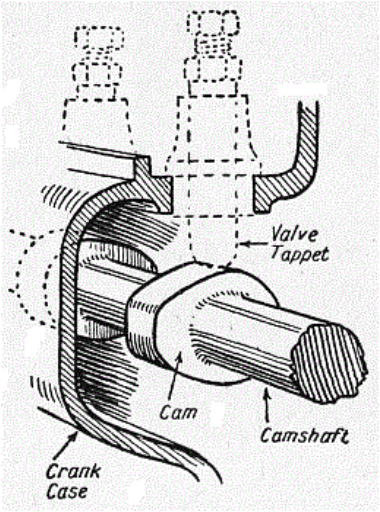
CAM: In Mechanics. The cam is a projection on the side of a revolving mechanism, such as a shaft, which causes any fitment that is brought into constant contact with its profile to perform a reciprocating motion.

With internal combustion engine design the cam is used for other purposes than the operating of the valve gear, such as the operating of the oil pump, and also of the water pump that is sometimes fitted to assist the cooling system. In these cases the shape of its profile differs considerably from the cam employed for valve gear work, inasmuch as its action is more gradual, a steady reciprocating movement being all that is required, as illustrated at A.



Cam. Diagrams illustrating actions of various cams; degrees indicate working period of cam's rotation.

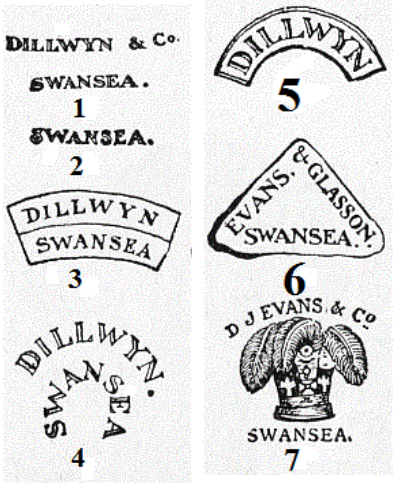
Left. Cam on camshaft applied to raising valve tappet.



Cam on camshaft applied to raising valve tappet.

B shows a cam with equal sides and a rest period at the top, i.e. a period of the cam's rotation during which the part being operated remains stationary. This design gives a quick opening, a long rest period at full open, and a quick closing. At C is given a cam having a moderately quick opening, a shorter rest period and a slower closing. D shows a cam with equal-sided faces and no rest period at the top. Generally speaking, it may be noted that the more rapidly a cam performs its lifting function, the more severe will be the blow given to the part to be lifted at the beginning of the operation. *See* Motor Cycle; Valve.

CAMBRIAN WARE. The term loosely comprises all the ceramic products of the Swansea works down to 1870, but collectors prize the opaque china, not true porcelain, produced after 1802, and decorated with painted shells, butterflies, birds and flowers, or with local landscapes. Swansea china, a soft-paste porcelain made after 1814, often bears decorations in the same style. There are also salt-glaze stonewares and cream-wares, represented by jugs, tea-sets and other patterns, as well as mantelpiece figures, unglazed buff reliefs, some Egyptian black, and imitations of Etruscan ware. Milk-maid-and-cow figures are charming and characteristic examples. *See* China; Pottery.



Cambrian Ware. Some of the principal marks on Swansea china. 1. Impressed mark, rare on china, common on pottery. 2. Impressed mark common on early examples 3-5. Common impressed marks. 6. Impressed mark, late period. 7. Transfer mark, latest period.

CAMBRIC. Cambrics are made both in cotton and in linen. They are of light-weight, fine and closely woven, and much used for making handkerchiefs. Linen cambrics are cooler to the touch than cotton and stand more washing. *See* Handkerchief.

CAMEL HAIR. Very soft and warm to the touch, camel hair can sometimes be distinguished by the presence of certain stronger hairs of a darker brown. Camels grow two kinds of hair, one relatively short and downy, grown on the body; the other longer and coarser, on the haunches, hump, and mane. The long hair is combed out as far as possible, but a little remains.

The hair of camels is collected in Central and Northern Asia, and manufactured in the same way as wool in Great Britain and other countries. The natural colour is fawn made into un-dyed blankets, dressing-gown cloths, etc. *See* Wool.

Camel Hair Brush. The best paint brushes in this hair are made with a knot of camel hair securely tied and pulled into a tin ferrule, which is then in most cases fitted with a long handle of plain coloured or ebonised wood. Camel hair is of a soft, silky nature, and the end of the brush being pointed, the smallest quantity of anything in liquid form can be applied. To clean the brush after use, a little paraffin should be worked into the hair, the brush squeezed out and washed in warm water, and, the hair pointed with the fingers.

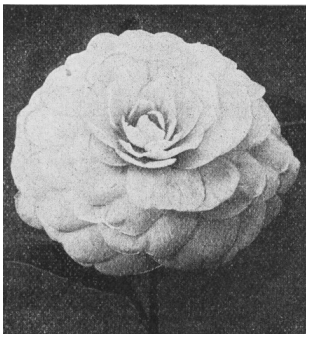
Camel hair pencils are made of knots fixed in quills

of birds' feathers varying in size between those obtained from the goose and the lark; the smallest sizes are found in a child's paintbox. Handles are supplied to fit into the quills.

Another use for camel hair is in the thin, flat brush made for damping paper for the letter copying press. The brush for painting the throat with iodine or other preparation is also composed of camel hair, the knot being pulled into a large quill, which is sometimes bent to facilitate reaching the inside of the throat. Care should be taken to see that the knot of hair is securely fastened, *See* Brush.

CAMELLIA. This evergreen shrub is generally grown under glass, but it is fairly hardy and may be planted out of doors in warm sheltered spots. In the greenhouse camellia is grown in large flower pots or in a bed of prepared soil. Thorough drainage is necessary, and a suitable soil compost consists of peat and loam with sand added freely. If grown in pots the plants should be set out of doors in the summer and replaced under glass in September. A temperature of 50-55 degrees is suitable.

Healthy plants have a habit of setting far too many buds. It is best to reduce the number, before the buds have developed, to not more than one on each shoot.



Camellia. Flesh pink flower of the variety known as Lady Hume's Blush.

After flowering, the plants should be pruned, but only sufficiently to preserve the shape of the bush. Crowding shoots may be thinned and straggling ones shortened.

Propagation is effected by means of grafting under glass in spring. If repotting be necessary it should be done directly the flowers are over, but should never be undertaken unless the pots are obviously crowded with roots. Camellias should be sponged occasionally for white scale, and fumigated for green fly if necessary.

Good varieties are alba plena, white; Comtessa Lavinia Maggi, white with deep rose stripes; fimbriata, white; Lady Hume's Blush, flesh pink; Mathotiana, glowing red; C. H. Hovey, crimson; Donckelaari, crimson and white; Reine des Beautés, rose; Thos. Moore, carmine.

CAMEMBERT. This is a popular variety of soft cheese. In France, its native country, it is usually made from whole milk of a quality similar to that given by Shorthorns. Often, however, separated or perfectly sweet skimmed milk is mixed with the new in proportion of 1 to 5. Usually made from Sept. to May, these cheeses are small; they weigh from 10 to 13 oz., about 5¼ gallons of mixed new and skim milk being required for each dozen. *See* Cheese.

CAMEO. This is a piece of relief carving in stone, such as sardonyx, chalcedony, agate. The layers of colour peculiar to these stones are utilised to form a background, after the front portions have been carved away. Cameos are also made from a variety of shell consisting of two layers, one of which is pink and the other white. The design is carved in the upper or white layer, while the lower or pink layer forms the background.

The value of the cameo depends on the beauty of its carving. A genuine cameo should be carved entirely out of one piece of material; many imitations consist of a badly carved subject cemented to a background of a different coloured material. Cameos may be cleaned by washing in warm soapy water and gently brushing with an old toothbrush.

CAMERAS FOR THE AMATEUR PHOTOGRAPHER

Hints on the Choice and Use of the Best Modern Types

For the principles of Camera Work see Photography; their detailed application is described under Developing; Enlarging; Film; Plate; Printing, etc. Other aspects are discussed under Cinema; Telephotography, etc.

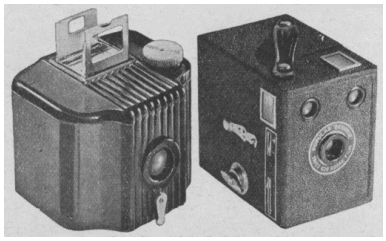
There have been continuous developments in camera design since photography became a popular hobby, the general trend being towards greater compactness coupled with increased efficiency. Better lenses and more precise adjustments have made it possible to produce with the modern pocket camera crisp sharp negatives that will enlarge to any reasonable size. Cameras taking smaller negatives than the once almost universal ¼ plate (4¼ x 3¼ in.) are therefore now popular. The 3¼ x 2¼ in. is now the most popular size, but Vest Pocket (2½ x 1⅝ in.) is widely used. Other popular sizes are 4¼ x 2½ in. and Postcard (5½ x 3¼ in.).

Most modern cameras can be loaded in daylight. The majority of them take roll film; cameras primarily intended for glass-plates or flat films (which have to be loaded in a dark room) can be made daylight loading by fitting a film-pack adapter and using film packs. Daylight loading films are the most convenient form of material when a number of pictures are to be taken. Plates or flat films are preferred by those who wish to make only one or two exposures at a time.

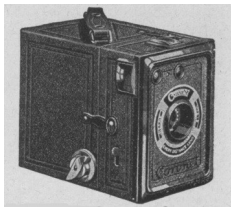
With practice and intelligent application of the principles of photography good negatives may be made with the cheapest camera and the simplest lens. It is only necessary to realize the limitations of the lens, and not to attempt subjects which are not within its scope. The beginner who blindly snaps at a fast-moving motor-car, or even people walking in a street, with a cheap camera and its necessarily slow lens is making failure inevitable. The more expensive cameras are fitted with faster lenses, admitting more light, and therefore permitting shorter exposures, i.e. quicker snapshots to be made.

Three Main Types. There are three main classes of camera: box form, folding pocket, and reflex. Cinematographic cameras are dealt with in the article on the Cinema.

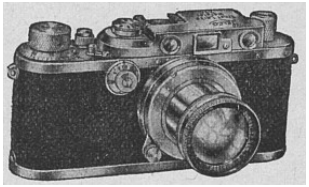
The box form is the simplest type, represented by the "Baby Brownie" (Fig. 1, to take pictures 6.5 x 4 cm.). A simple lens is fitted so that snaps can be taken only in fairly bright light, but the camera is so simple and solidly constructed that a very high proportion of good pictures results. Another simple box camera is the "Popular Brownie" (Fig. 2). It is fitted with a single lens and a Time and Instantaneous shutter. The pictures taken measure 2¼ x 3¼ in. Yet another example of modern box camera is the Coronet "Every-Distance" (Fig. 3) which, with a special type of lens gives sharp images at distances from 3 feet upwards without a portrait attachment. Equipment includes large brilliant finders and a Time and Instantaneous shutter.



Camera. Figs. 1 and 2. Left, "Baby Brownie" Kodak model fitted with single lens and snapshot shutter. The viewfinder is of the metal frame type and folds into a recess. Right, Kodak "Popular Brownie" for pictures of 2¼ x 3¼ in. It is equipped with two ground glass viewfinders.



Camera. Fig. 3. Coronet Every-Distance-8 box camera. A 4-in. f/4 lens allows close-ups and views to be taken without additional attachments.



Camera. Fig. 4. Leica Model IIIa precision miniature camera. Standard size cinematograph film is used giving 24 x 36 mm. pictures.

Folding pocket cameras are made in all sizes from the miniature type (24 x 36 mm.) to 5½ in. x 3¼ in. (postcard pictures). Some are self-erecting, the lens front being automatically pulled into position as the baseboard is pulled down; in other types the base is pulled down and the lens front slid out on runners.

Various types of lenses and shutters are fitted to folding cameras, from the simplest to the most expensive. A good medium priced camera equipped with a f 6.3 lens will enable snaps to be taken successfully even on dull days. Simple box cameras are fixed focus- only objects more than, say, 5 ft. away will be sharp unless a supplementary lens, a portrait attachment, is used. Folding cameras of the cheaper type usually have a focussing attachment; by setting a pointer at the appropriate distance on a scale the lens-to-film distance is adjusted.

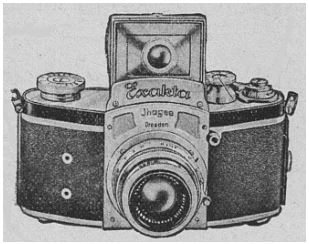
Many folding cameras of the more expensive type have built-in range-finders.

The Miniature Camera. Cameras which are described as being of the miniature class have achieved notable popularity in recent years and, with the introduction of the Leica (Fig. 4) a new photographic technique came into being. Although there is no arbitrary limit to the size of "miniature" photographs it is generally accepted that all cameras producing pictures of 2¼ x 2¼ in., and less, fall into this class.
There is a large selection of these instruments on the market today, ranging from the box type costing a few shillings to precision models equipped with every possible refinement.

Some miniature cameras take pictures as small as 1½ x 1 in., and a large number use 35 mm. cinematograph film in roll form and give up to 36 exposures at a single loading.

Other miniature types are designed to give 16 exposures on standard Vest Pocket spools, and another class takes 16 exposures yielding a picture size of 2¼ x 1⅝ in., on 3¼ x 2¼ in. film. Another type produces 12 2¼ x 2¼ in. pictures on standard 3¼ x 2¼ in. size film.

The Stand Camera. The types of cameras named above are primarily hand cameras, though most of them are fitted with a bush for attaching to a tripod when time exposures are to be given. The hand or stand camera is a type that takes plates, cut films or film-packs, and has a proper ground-glass screen for focussing the image when used upon a tripod, in addition to a pointer and scale for use when the camera is used in the hand. Most cameras of this pattern fold up small enough for the pocket, plates being carried in dark slides, or a larger number of flat films in a film-pack with adapter. The example shown in Fig. 10 will take plates, cut film, or film-packs of 4¼ x 3¼ in. size. It has a long extension with universal swing-front and an arrangement for using wide-angle lenses. The movement of the front enables the lens to be raised to the level of the top edge of the plate. The front is moved backward or forward by a rack and pinion, and there is a circular, spirit level fitted to the baseboard.



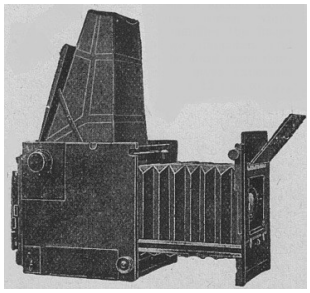
Camera. Fig. 5. Kine-Exakta single-lens miniature reflex camera. Standard cine film loaded in cassettes is used, giving 36 exposures.

The Reflex Camera. With the reflex camera (Fig. 6) focussing is done visually up to the moment of exposure on a screen at the top of the camera.

The general principles of a reflex camera are illustrated in Fig. 7. P is the plate holder; B is the revolving back for horizontal or vertical pictures; F is the focal-plane shutter; M is the hinged mirror which

swings to the dotted position during exposure of the plate; G is the ground glass upon which the object is viewed; H is the viewing hood: L is the lid to cover hood when folded down; R is the rising and falling front; S is the sky shade and lens cover; T are the sliding guides and racks; V is the focussing pinion.

The focal-plane shutter consists of a blind running close in front of the plate and having in it a slit, the width of which can be adjusted. The blind is wound with a spring, and when released passes very rapidly in front of the plate, giving an exposure which may be as short as 1/1000 of a second.



Camera. Fig. 6. Typical reflex type camera showing bellows extension, viewing hood, lens cover, and other main features.

Many miniature cameras are of the reflex type and are equipped with either twin lenses or a single lens. An example of the latter is the Kine-Exakta (Fig. 5). This instrument has a special focussing screen which magnifies the image two diameters and the focal plane shutter gives exposures from 12 sec. to 1/1000 sec. This camera takes standard 35-mm. cine film and allows 36 exposures to be made.

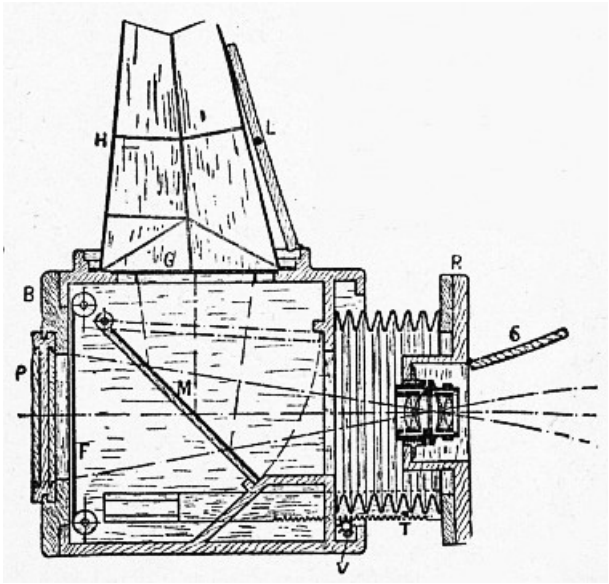
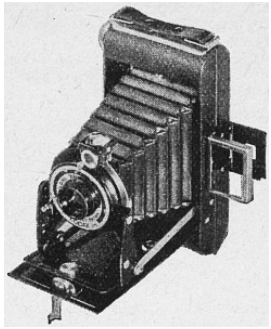
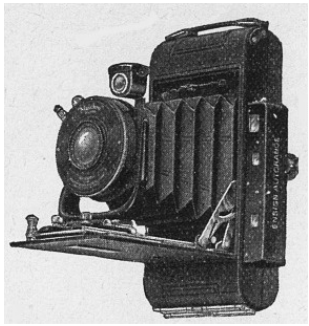


Fig. 7. Sectional diagram of reflex camera showing general arrangement. Parts shown include revolving back (B) and plate holder (P), focal shutter (F), viewing hood (H), and hinged mirror (M).

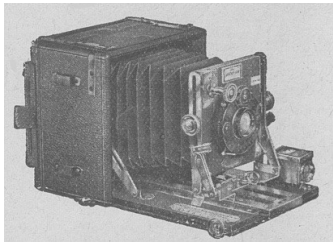
Choice and Use of a Camera. The choice of a camera depends upon the amount of money an amateur can afford, and upon the kind of work it is desired to do. The lens is the most important part of the camera. The best lenses are known as anastigmats, next to them come the rapid rectilinears (known also as doublet or R.R. lenses), and after them come the single lenses, the cheapest form, which do excellent work when properly used.





Camera. Fig. 8 (left). Kodak Six-20 folding "Brownie" taking 3¼ x 2¼ in. pictures. Fig. 9 (right). Ensign "Autorange-20" folding camera equipped with range-finder coupled to lens and shutter. This instrument takes either eight 2¼ x 3¼ in., or sixteen 2¼ x 1⅝ in. pictures on standard 2¼ x 3¼ in. film.

If the would-be photographer wishes to do ordinary snapshot work he cannot do better than choose the best roll-film camera he can afford, deciding the size of original negative desired (always remembering that it may be enlarged), and the quality of the lens. Better use a small size with a good anastigmat lens than a larger size with a single lens.



Camera. Fig. 10. Ensign-Sanderson folding model taking 4¼ x 3¼ in. plates, film-packs or cut film.

In ordinary use in temperate climates cameras, either hand or stand, will last for years without needing any repair. The only care which they require is occasional wiping of dust from the inside of the bellows with a damp cloth.

In all the patterns of the hand camera which have been described, with the exception of the reflex, the user has to do two things in order to get a satisfactory picture. One is to hold the camera so that the exact picture required is seen in the finder. For this purpose it is best to use the direct-vision finder rather than the misleading "brilliant" finder.

The second essential is to obtain a sharp picture. With a tripod camera the actual picture is viewed on a ground-glass, and the lens moved in or out and adjusted by using a smaller stop until the necessary sharpness of definition is seen. With most hand cameras the distance of the principal part of the subject has to be judged by the eye, and the lens then racked in or out until a pointer on the focussing scale comes opposite the mark corresponding with the judged distance.

The smaller the camera and the smaller the stop in the lens the easier it is to obtain a sharp picture, even though the distance of the subject has not been quite correctly judged. With miniature cameras where considerable enlargement is necessary accuracy of focussing is ensured by scientific range-finders.

A cause of failure among many beginners is unsteady

holding of the camera. Most people clench the camera too rigidly; it should be held rather loosely, with the muscles of the arms or hands relaxed. Tight holding has the result of causing a certain muscular vibration, the effect of which in the picture is slight fuzziness. A very small camera should be pressed gently against some rigid support when making an exposure.

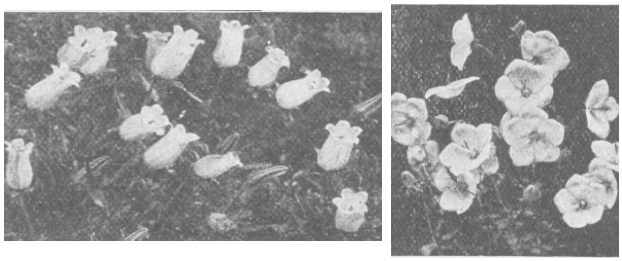
Even the cheapest hand cameras allow of much better pictures being taken if used on a light tripod. A longer exposure can then be given by using the time and bulb adjustments, marked T and B on the shutter scale. Set to T, the shutter is opened by pressing the trigger, and remains open until the trigger is again pressed. Set at B, the shutter remains open as long as the trigger is kept pressed. Fully exposed pictures may thus be taken, even in a very dull light and with the slow lenses fitted to the most inexpensive cameras. But the subject must not contain objects in movement.

CAMOMILE. This is a family of hardy rock and border plants. The flowers are white, silvery grey, and yellow, and the plants, which are mostly summer-flowering, do not need any special cultivation. Anthemis Biebersteinii, grey leaves and yellow flowers, 12 inches, and macedonica, white flowers, 6 inches, are suitable for the rockery. Kelwayi and tinctoria grow 2 feet high and are valuable border flowers.

Camomile Tea. The dried flower-heads of the camomile are sometimes infused at home to make camomile tea. It is made as follows: Soak 1 oz. of the dried flowers in a pint of boiling water in a covered pan for 15 min. Strain off liquid and add sugar to taste. It acts as a mild tonic and is good for sleeplessness. If given hot it promotes perspiration, and administered warm acts as an emetic. The infusion obtained from a chemist is of a uniform strength, and the dose is 1 to 4 oz. The drug is used in this way as a tonic and stomachic, as it is an aromatic bitter.

A camomile poultice is an old household remedy for inflammation and sprains. For this purpose the flower-heads are put in a bag and boiling water is poured over them. The oil, in doses of ½ to 3 minims, is a stimulant and antispasmodic, like other volatile oils.

CAMPANULA. Some of the most delightful hardy flowers for borders and for the rock garden are found among the bellflowers or campanulas: a few are suitable for the greenhouse. The border kinds flourish in sunny or slightly shady places and in ordinary soil which has been dug deeply and manured. Planting may be done in autumn or spring. The best perennial campanulas for the hardy flower border are persicifolia and its varieties Telham Beauty, blue, and Snow King, white, 2-3 feet; glomerata, blue, 18 inches; Hendersoni, mauve-blue, 12 inches: lactiflora, palest blue, 2-3 feet; latifolia macrantha, purple, 3-4 feet; latiloba, blue, 2 feet, and its white variety. These may be raised from seeds sown in fine soil in a frame in spring or by detaching and replanting rooted pieces in summer. Lactiflora may perish after flowering; it is wise to raise seedlings every year or to take care of self-sown seedlings.



Left. Campanula. Bell-like flowers of C. Allionii, a rockery plant. Right. C. carpatica, grown as a pot plant.

The campanulas suitable for the rock garden thrive in moist, gritty soil in slight shade. The best are pusilla, blue, and its variety Miss Willmott, pale blue; muralis, purple blue; G. F. Wilson, purple-blue; pulla, purple; garganica, lavender-blue; carpatica, blue. The last named is more vigorous than the others, reaching a height of 12 inches when in bloom.

Some of the rock garden campanulas are difficult and must be grown in very gritty, thoroughly drained soil such as is provided by a moraine. Among them are Allionii, cenisia, Rainerii, and Zoysii. Seeds sown in spring in pots of very fine soil placed in a frame provide the best means of propagation.

The chimney bellflower (campanula pyramidalis) is a handsome plant, 3-4 feet high, suitable for planting out of doors or for cultivation in pots. Seeds are sown in March under glass to provide flowering plants the following year. Campanula isophylla, blue, and its white variety, alba, make charming plants for the room, window, or greenhouse; they should be grown in suspended pots, for they are of drooping growth. They are easily raised from seeds in spring and need a compost of loam, leaf-mould and sand.

The popular Canterbury Bells are varieties of campanula medium. There are single, double, and cup and saucer varieties in white, pale rose, purple, lavender-blue and other shades. The plants are treated as biennials: seeds are sown in boxes of fine soil in a frame in May. The seedlings are planted on a reserve border when large enough, and are put out in autumn or spring when they are to bloom the following summer. They are useless after having flowered. Plants which do not bloom in the year following seed sowing should not be disturbed: they will flower exceptionally well the next year. *See* Canterbury Bell.

CAMPHOR. Camphor is a pungent crystalline substance obtained by the distillation of the wood of the camphor laurel. The commonest preparations used in medicine are:

Camphor water—dose, ½ to 2 oz.
Spirit of camphor—dose, 5 to 20 minims.
Compound tincture of camphor (paregoric)—dose, ½ to 1 fluid dram. This contains opium.
Liniment of camphor and ammonia.

Rubbed directly on the skin camphor has a stimulating effect, dilating the superficial blood vessels,

and leading to an immediate feeling of warmth. As this passes off partial loss of sensation in the skin follows. It is for these effects that camphor liniments are so commonly used in chronic rheumatism, sprains, bruises, neuralgia, etc.

Internally camphor has a stimulating effect on the stomach, increasing both its muscular movements and the outpouring of gastric juices. It is also a heart stimulant, frequently prescribed when the pulse is thin and feeble. As it has a mild diaphoretic action on the skin, camphor is added to many cough and cold mixtures. The compound tincture of camphor was a common household remedy for colic and diarrhoea. It should not be forgotten that this preparation contains opium.

Spirit of camphor may be taken at the beginning of a cold, 10 drops on a lump of sugar. Camphor balls are used for rubbing on chapped skin. It is of service in relieving itching, and for this purpose the spirit may be dabbed on, or camphor water may be used as the basis of a lotion, e.g. zinc oxide 1 dram, glycerin 1 dram, camphor water 1 oz.; to be shaken well before applying.

Camphor Balls. Owing to its high cost camphor is comparatively little used in the home, but its efficacy in keeping away moths and other insects from clothing has long been recognized. Three or four camphor cubes about ¾ in. square placed in the drawer or trunk in which the clothes are kept will preserve them from all the ravages of insects. To protect dried botanical specimens a little powdered camphor should be dusted between the leaves of the specimen book.

Camphor is useful in insect powders. Equal parts of camphor and boracic acid is an excellent powder for dusting on animals to prevent attacks by fleas. The addition of pyrethrum powder in the proportion of about three of pyrethrum to one of mixed camphor and boracic acid forms an insect powder which is good against practically all insects.

A cheap substitute for camphor, sold under the name of moth-balls, or carbon-balls, is not composed of camphor at all, but of naphthalene. A handful of naphthalene balls will protect stored clothes from moth, and the powdered form of naphthalene will take the place of camphor in insect powders.

CAMPHORATED CHALK. A popular dentifrice is made by mixing camphor with precipitated chalk in the proportion of camphor 1 oz. to chalk 9 oz. The camphor is first reduced to a fine powder in a mortar by rubbing it with a few drops of rectified spirits of wine or spirit of camphor. The spirit soon evaporates when the chalk is stirred in. It is advisable to keep camphorated chalk in a bottle to prevent evaporation of the camphor. *See* Chalk; Teeth.

CAMPHORATED OIL. This is another name for the liniment of camphor, which formerly was official, and consisted of 1 oz. of camphor dissolved in 4 oz. of olive oil. It is used as a stimulating liniment, and is especially useful for chest complaints in children. The official liniment now contains ammonia, and is known as the liniment of camphor and ammonia. Camphorated oil is preferable for young children, however. Camphor in sterilised olive oil (camphor 1 part, olive oil 5 parts) is used as a heart stimulant in pneumonia, influenza, and other diseases. It is injected under the skin in doses of from 10 to 30 minims, and has proved most useful. *See* Camphor.

CAMPINE FOWL. Owing to its economical qualities this fowl is much esteemed by many poultry keepers in Great Britain. It is a prolific layer of good-sized white eggs, and when fattened makes a plump, though rather small, table bird. There are two colours, gold and silver. *See* Poultry.

CAMPION. There are both annual and perennial kinds of Campion (silene); they nourish in ordinary soil in a sunny position. The most popular annuals are varieties of Silene pendula; they are grown chiefly for spring bedding, as a groundwork to beds of bulbs. Bonetti, deep rose, and Double Salmon, pink, are two good ones. Seeds are sown on a reserve border in July, and the seedlings planted finally in October. Seeds may be sown in April to provide summer-flowering plants. Silene armeria, 12-15 inches, has rose-coloured flowers in summer; seeds are sown in April.



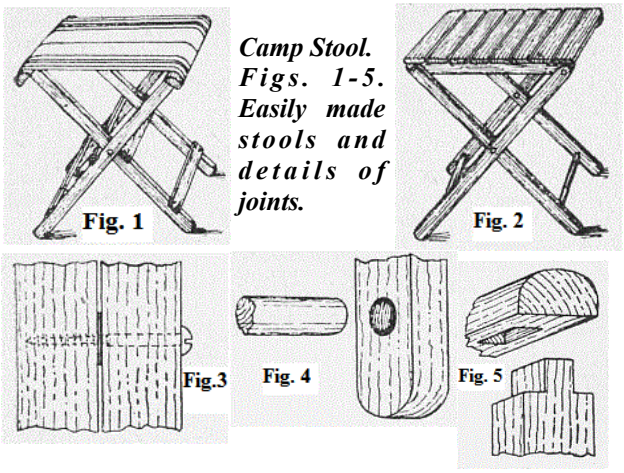
Campion. Flower heads of Silene armeria, a pretty rose-coloured campion.

Of the perennial kinds the most useful are Silene alpestris, white, 6 inches, and schafta, rose, 6 inches; both are suitable for the rock garden. Silene acaulis, which forms a moss-like cushion and bears rose pink flowers in April, is difficult; it is most likely to bloom if grown in gritty soil in the moraine. Silene maritima flore pleno is an attractive plant 6 inches high, which bears double white blooms in summer. Seeds sown in fine soil in a frame in spring provide an easy method of propagation; the stock can also be increased by division in autumn or spring.

CAMP STOOL. In the folding camp stool, types of which are shown in Figs. 1 and 2, the seat is usually of canvas and the legs are pivoted. The commonest type is that in Fig. 1. The canvas is stretched when the legs are open and folded when closed.

Fig. 2 has a wood seat, and the joints at the tops of the legs have to be made to suit, for the seat must fold over, instead of collapsing like the canvas stool. One pair of legs are pivoted to the seat and the other pair are detachable from it, so that it can turn over as if hinged. The pivoted joints generally swivel on a rivet. Another way is to use a screw, as in Fig. 3, instead of a rivet. The piece of wood nearest the head of the screw should be sufficiently slack to swivel without turning

the screw, and the thread of the latter should be immovable in the other piece of wood. The lower parts of the legs are united by cross pieces, varieties of which are shown in Figs. 1 and 2.



Camp Stool. Figs. 1-5. Easily made stools and details of joints.

Slats on the legs or back are screwed on. They are often a little longer than the actual distance over the legs, partly to avoid short grain beyond the screw holes and partly to avoid flush surfaces where one part shows end grain and the other side grain. Another reason is that the projecting ends act as stops for the folding parts.

The round rod connecting the lower ends of the legs in Fig. 2 is glued into a bored hole (Fig. 4), or may be secured by a wire nail. The hole is not bored entirely through the leg. In seats of the kind shown in Fig. 1 the tops of the legs are generally tenoned into the rail the canvas is tacked to (Fig. 5). The tenon may or may not go completely through. The wood is usually birch or beech.

CAMSHAFT. The shaft that drives the cams operating the valves (inlet and exhaust) of an internal combustion engine is known as the camshaft. Except in very large engines the cams are usually formed as part of the shaft. In the case of the overhead camshaft, it is so designed that one cam operates two valves. *See* Cam; Motor Cycle; Valve.

CANADA BALSAM. From this resinous substance, obtained from a Canadian tree, Canada balsam cement is made. It is used for mounting microscopic objects and mending broken glass. The cement is a thick, glassy liquid prepared by dissolving 3 oz. of Canada balsam in a bottle containing 3 oz. of benzol, the contents being shaken until the balsam has dissolved. The solution may be obtained ready prepared from most firms dealing in microscope accessories.

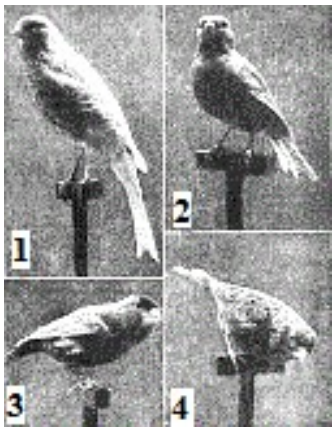
CANAPÉ. These may be either rounds or fancy-shaped pieces of bread and butter, cut very thinly, and served with savouries. Cut shapes in toasted or fried bread are sometimes known as canapés, but are more often called croûtons.

CANARY. In buying a singing canary it is important to make sure of two things—that one is getting a cock bird, and that it is young. A healthy singing pet should live at least 10 years, and may even reach twice that age, but its length of life will naturally depend on the constitution with which it starts and on the care it receives in the matters of food and housing. The best time to buy a singing bird is in the summer or autumn, when the young birds of the season's breeding are on the market. To be certain of the sex it is necessary to hear the bird sing; for, so far as appearances go, cock and hen canaries are so much alike that only expert fanciers can distinguish them, and even they cannot always be certain.

The plumage should be very close and neat, and the legs and feet quite smooth, with delicate claws; if the legs look rough and horny, owing to the projection of the edges of the scales covering them, and if the claws are long and coarse, the bird is either aged or has a poor constitution, the overgrowth of horn early in life being a bad sign. The bird should also be active and restless in its movements, and always ready to burst into song. The colour is quite immaterial, though most people prefer a pure yellow bird.

Best Singing Canaries

The smaller breeds of canaries are the best for pets, as they are more active and hardy than the large kinds, and their song is not so loud and piercing. In fact, the best singing canaries are the small Rollers. These have a beautiful soft running song, without the high notes, which are often rather too prominent in that of the ordinary canary.



Canary.: four English breeds. 1. Lancashire Plainhead Buff. 2. Norwich. 3. Yellow Norwich. 4. Golden-spangled Clear-cap Lizard.

To keep a canary in condition, one should buy as large a cage as space and funds permit, and this should be of the pattern with slips of glass round the bottom to prevent seed being scattered about the room. The best shape is oblong, and the cage should be hung in a room where the temperature does not vary much, placed well out of any draught, out of reach of the cat, if one is kept, and not above the gas.

The food should be canary and rape seed, and the latter should be the brown summer rape, at any rate for Rollers. A few grains of hemp may be given daily as a treat; but this is too fattening a seed to be given at discretion. A spray of millet to peck at makes a change. The only delicacies that should be allowed are green food or fruit, which should be given daily. In summer groundsel, chickweed, flowering grass, or dandelion

can generally be had; tender lettuce and watercress are also good, and a slice of ripe apple is much appreciated. But too much of this raw food should not be given, as if stale it is injurious; nor should any be used in a frosted state in winter. When the bird is moulting it may have a piece of stale sponge-cake daily, but not at other times.

Sand should always be available so that the bird can select the grit it requires for grinding its food; it is usual to cover the drawer of the cage with this, but as long as a teaspoonful or so of sand is put down whenever the cage is cleaned, the drawer can be just as well covered with sawdust or cedar litter It is best to cover the drawer of the cage with paper before putting the litter on, and the cage should be cleaned out after the bird has had its bath, which it should have at least twice a week. A piece of cuttlefish bone should be stuck in the wires for the bird to exercise its beak upon and to give it lime. In warm weather the cage should be hung outdoors, but care should be taken to protect it against rain, wind, and scorching sun.

If it is considered desirable to breed canaries, the hen bird should be got before Christmas A cock can be got at any season but hens which are on sale in the spring are often birds which have proved to be bad breeders, for the best birds are all booked up, so to speak, by that time. The cock and hen should be kept apart, if possible in separate rooms, till the middle of March at least, or the warm indoor atmosphere of a house will tend to make them nest too early.

The breeding-cage should be at least 2 ft. long and provided with two nests, and a bag of dry moss and chopped tow and wool for nesting material. The usual clutch of eggs is five, and the time for sitting a fortnight. Just before the eggs are due to hatch the birds should be supplied with egg-food, made by finely chopping hard-boiled egg and mixing it with crushed biscuit or stale breadcrumbs. It must be prepared cleanly, as it is most injurious if allowed to get sour. Green food must be given regularly.

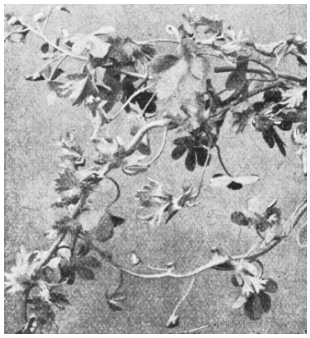
Diet of the Young Birds

On these soft articles of food the birds will feed their young, disgorging the food from their crops. At three weeks old they should leave the nest, but will be fed by their parents for a little time still and should have egg-food till they are well used to cracking seed. As soon as they feed themselves they should be separated from their parents and put into as big a cage as possible. The old birds will nest several times during a season, but three broods are quite enough for them, and they should be separated after the last till the next-season.

Canaries will live and breed well outdoors in an aviary, but this must be sheltered from wet and winds, and the birds must be first put out in late spring, not in autumn. Moreover, in an aviary there should always be at least three hens to every cock, with a proportionate number of nests. If they are properly housed, they will bear the winter as well as British finches.

CANARY: A White Wine. Wine produced in the Canary Islands was formerly drunk in England under this name. The best is called Bidogne or Vidonia wine. It is a dry, white wine somewhat resembling Madeira, but with less body and perfume. The name Canary was formerly applied generally to dry white wines, many of them mixed with sugar and cinnamon.

CANARY CREEPER. Grown as an annual, the canary creeper is popular for training over trellises, up porches and above window-boxes. The seeds are best sown under glass in spring, in pots or boxes, and the young plants set out in May or June. The plants grow fast in moist fertile soil, and soon come into bloom. The flowers are small and a bright pale yellow in colour, and are produced very freely. For rapidly covering fences, concealing ugly spots in newly formed gardens, this creeper has few equals.



Canary Creeper. Sprays of flowers and leaves of the quick-growing creeper.

CANARY GRASS. A hardy perennial, sanary grass or phalaris, of 3-4 ft. high, has various names in different localities. Thus it is known as bride's laces, French grass, gardener's garters, lady grass, lady's garters, lady's laces, painted grass, ribbon grass, silver grass, sword grass. It is a fickle waterside plant, which frequently reverts to type. It thrives in any soil which contains plenty of moisture, and can be propagated by division in spring. In a variegated form the leaves are striped with white or pink. The species Canariensis is not often cultivated. Its seeds are the well known shining canary seed of bird-lovers.

Canary Seed. When ripened and dried this is sometimes given, alone or forming part of a mixture, to canaries and other birds.

CANARY PUDDING. Well grease some small moulds, place 3 oz. each of butter and castor sugar in a basin, and beat them to a cream. Mix together 6 oz. of flour, one tea-spoonful of baking powder, and the grated rind of a lemon. Well beat two eggs, and then beat them into the butter and sugar. Add the flour, etc., lightly, also the strained juice of a lemon, and lastly 2 tablespoonfuls of milk. Half-fill the moulds with the mixture, cover them with a piece of greased paper, and steam them for ¾ of an hour. Turn them out and serve with jam sauce.

CANCER. For malignant tumours of all kinds the general name of cancer is often used, such tumours having the characteristics of growing again when removed, of reappearing as secondary growths in

organs perhaps far distant from that attacked by the original growth, of leading to wasting and great general weakness, and of eventually killing the patient.

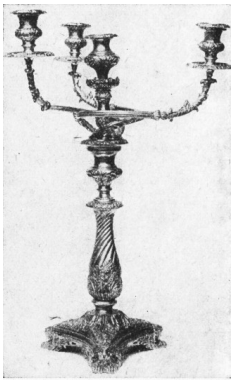
Cancer of the throat is said to be frequent in smokers, and these may have induced chronic catarrh by tobacco smoke. A jagged tooth may produce cancer of the tongue. In countries where the men eat their food hot cancer of the stomach is common, whereas it is almost unknown amongst the women, who eat their food cold. Cancer of the stomach occurs usually on that part of its lining which would be irritated by hot liquids.

The chief signs of cancer are a rapidly developing tumour or the formation of an ulcer, with a hard flattish base, and irregular, hard edges. Contrary to common belief, pain is not a common early symptom, though it may be very severe in the late stages. The treatment of cancer is the extirpation of the growth by operation, and if this is done early enough the likelihood is that the disease will not recur. Unfortunately too many people put off seeking advice about lumps or sores or haemorrhages till the disease has obtained a wide hold on the parts affected or has been disseminated to distant parts.

Radium and X-rays have produced good results, but, with the exception, perhaps, of rodent ulcer, the proper treatment of cancer is early operation. The other forms of treatment find their proper sphere in those cases which unfortunately have been allowed to get beyond a point where operation is of any use. They may prolong life, but can do little more.

Relief of Cancer. To mitigate the ravages of cancer much research work has been done, chiefly by the Imperial Cancer Research Fund, 8, Queen Street, Bloomsbury Square, London, W.C.1, and the British Empire Cancer Campaign at 11, Grosvenor Crescent, London, S.W.1. For sufferers there is a National Society for the Relief of Cancer, at 47, Victoria Street, London, S.W.1, and Cancer Hospitals in Fulham Road, London, S.W.3. and Nassau Street, London, W.1.

CANDELABRUM. A holder for two or more candles, the branches of the candelabrum may be attached to a bracket for fixing on a wall, or to a standard for placing on a table. The wall candelabrum with two or three branches has been extensively adapted for electric light, the bulbs being shaded by screens of silk fixed vertically.



Candelabrum. Chased Sheffield plate example, with four lights, c. 1800-10. (Courtesy of Chapple & Mantell, London.)

Brass candelabra are often lacquered, in which case they should be simply wiped with a soft cloth, and only sponged with warm soapy water; any attempt at polishing will destroy the lacquer. If medallions of Wedgwood ware or china are let in, do not loosen the cement with which they are fixed by too hot water or much rubbing.

CANDIED PEEL. There are three kinds of candied peel, viz. citron, lemon, and orange, and the method of preparation is practically the same for each.

In the following S. American recipe for preparing candied peel at home, rinds left over from jellies, etc., can be utilised. Soak the rinds from 4 oranges or lemons in slightly salted cold water for 3 days. Then drain, rinse, and boil the rinds in fresh water until they are quite tender. Make a strong syrup by boiling together 2 breakfastcupfuls of white sugar and one breakfastcupful of water for 5 min., keeping the pan uncovered.

Put the cooked rinds into a basin, pour over them the boiling syrup, cover the basin and let it stand for 2 days. After that time strain off and boil the syrup. Put in the rinds again and boil them until they look semi-transparent. Probably they will need 15 or 20 min boiling. Take out the rinds, lay them on flat tins, put a little of the syrup in the hollow centre of each piece, turning them up like cups, sprinkle all over with castor sugar, and dry them in a cool oven. If they are not dried in one day, continue on the next. Keep the rinds in airtight tins, using them as required. Besides its use for flavouring cakes, puddings and other sweet dishes, peel can be cut into shapes for the decoration of shortbread.

CANDLE. The cheaper sorts of candles are generally made of paraffin shale wax. Others are of stearin, which is pure white, harder, and more opaque than the paraffin candle and burns longer, but is more easily broken. On the other hand it can withstand hot weather when the paraffin loses its shape. A medium grade is manufactured from an admixture of the two, and costs very little more than paraffin. Tallow candles, which are a dirty yellow in colour, are new chiefly used by plumbers and in engineering works, having been superseded in the household by the cheaper and more serviceable wax candle. Spermaceti, which is obtained from the cachalot whale, is employed in the manufacture of the most expensive candles.

For photographic purposes, carriage lamps, and invalid food heaters, the candles in use are similar in composition to the domestic wax candles, but are made with a special wick, which generates little heat; otherwise, being burnt in a small enclosed space, the wax would quickly dissolve.

Candles are sold by weight, the various size units, sixes, eights, 12's, etc., indicating the number of candles going to the pound. The usual sizes for domestic use are sixes to 14's. All sizes are equally economical, as the smaller the candle the smaller is the wick inserted, and therefore a given weight of candles of any size will burn the same time as a similar weight of any other size. Candles, it should be noted, improve with keeping; if the wax is allowed to harden, they will last longer and

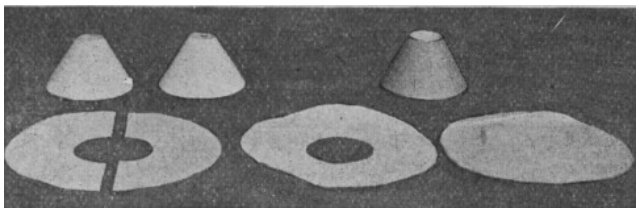
give a better light.

Decorative Uses. Coloured candles are used in room and table decoration, in silver, glass, or other ornamental candlesticks. The best coloured candles are solidly dyed, and not surface tinted, and taper in shape. They may be obtained in many shades to tone with any colour scheme. Candles are often used for dining-table lighting in preference to other methods of illumination. Miniature candles in various colours are used to border a birthday cake.

Self-fitting candles are usual in white, but if a coloured candle will not fit the candlestick, immerse the end of the former in a cup of warm water, and while the wax is still soft, push it into the candlestick.

Candle grease may be removed from clothes by placing a piece of blotting-paper over the grease mark and pressing it with a hot iron. In obstinate cases fresh pieces of paper should be placed under the iron until all the spots have disappeared. *See* Night Light.

CANDLESHADE: How to Make. Silk shades may be made on wire frames with thin silk and necessary trimmings. Fluted or square shades are a change from the usual round shape; or the shield type of shade can be used when the candles are placed on shelf or bureau, or for electric candle lamps in wall lighting.



Candleshade. Stages in cutting out parchment to make an ornamental shade.

To make a round or square silk shade first cut narrow strips ½ in. wide, either selvedge, or crossway; if there is plenty of material available choose the latter. Cover the whole wire frame by tightly binding with the strips of silk; when starting a new strip, sew securely to prevent the material slipping. When the frame is completely covered, cut pieces of silk sufficiently deep to allow neatening at top and bottom. The length of silk depends whether it is to be perfectly plain or to be gathered or pleated on the frame. For the latter method, measure round the bottom of the frame, and allow about as much again for the gatherings.





Candleshade. Left, candleshield consisting of orange silk stretched on a home-made wire frame, decorated with a daisy stencil and edged with gold galon.

Right, candleshade made from drawing paper.

Mark the halves and quarters of the strips of silk with a contrasting cotton, also the top and bottom rims of the frame. Run a gathering thread at both top and bottom edges of silk, join to form a circular strip, and gather the silk and place it in position on the frame, taking care that the halves and quarters of the silk are made to correspond with those of the frame. Attach the silk to the covered wire by sewing, the raw edges being turned inside.

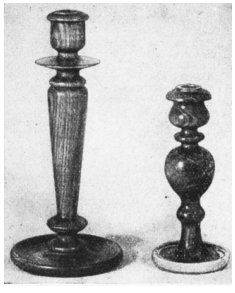
A good trimming is a tiny ruching *(see* Bag) of the silk sewn on the edges of the frame, or coloured wooden beads of different shapes may be threaded to hang from the frame in a kind of fringe, or a very narrow silk fringe to match the shade may be used on the lower edge. Such shades are suitable for electric candle lamps.

Silk shields may be plain or designs may be painted or stencilled on them. The edge should be fastened with a cord or narrow gimp. Mandarin inks are the best colouring medium to use for shades as they are transparent. Stencilled designs may be outlined in embroidery silks, as in the shade illustrated. Parchment shields can be bought cheaply, and decorated by means of oil-paint transfers.

When making round parchment and paper shades, the stiffness of the medium may render a frame unneccessary, and the shade, when completed, is placed on a holder with adjustable clip. Although the word parchment is used, real parchment or vellum is not often employed for shades, owing partly to the cost and the limited supply, partly to the fact that more skill is required to work on vellum. To obtain the pattern, use any suitable paper; pencil a circle round an ordinary meat-plate for outer circle and round a cup or small saucer for the small circle. The distance between the two circumferences gives the depth of the shade. Cut this wide circle in half, and there will then be patterns for two candleshades.

Amongst the simplest and cheapest kinds of candleshades are those fashioned of cartridge paper. These may have plain tops and coloured borders, or may be hand-painted with Chinese designs of dragons or birds, or illustrating the Willow pattern. The choice of colouring and design must be influenced by the room and candlestick. *See* Lampshade.

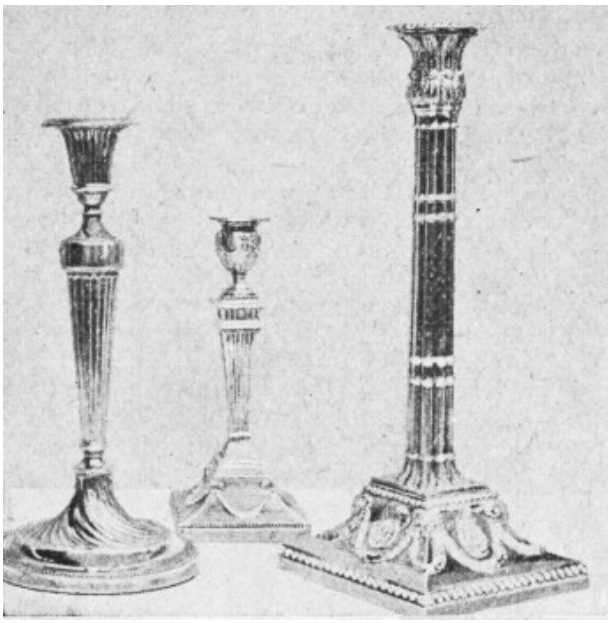
CANDLESTICK. In places in the country where neither gas nor electricity is available the candle is still the only illuminant for the bedroom, which is usually provided with standard candlesticks for dressing-table and mantelshelf. In addition a candlestick with a base for holding the matchbox is placed on the hall table early in the evening for each person in the house.



Candlesticks in wood, that on the left of oak, the other being turned complete from a piece of cocus. (Courtesy of George Adams)

Where candles are not a necessity, the candlestick is used for its ornamental quality, enhanced by coloured candle or shade. Very tall standards are made in polished or lacquered woods, or severe designs are carried out in metals, and faceted mirror glass. The older types in pewter had a base shaped like a bell and a grease tray half-way down the stem. Later models of brass, copper or silver had bases square, round or oval with columns surmounted with a capital to form the socket, or with grooved or spiral stems. These are particularly suitable for dining-table use and in crystal glass are also popular and sometimes adapted for electric lamp candles.

Wooden candlesticks of simple yet pleasing pattern are readily turned by the amateur who has a small lathe or a mandrel. Those shown in the previous page, worked in oak and cocus wood respectively, were made on a Verschoyle mandrel *(See* Lathe). The larger of the two is 10½ in. high; the base (turned separately) is 4¾ in. across. The other pattern is turned complete from a piece of cocus. It is 8 in. high, the base measuring 3¼ in. *See* Mandrel; Wood Turning.



Antique examples. Left, Fig. 1. English, late 18th century candlesticks, that on the left being of silver gilt, the other two of silver.



Fig. 2. Right. Brass church candlestick, early 16th century.

Bedroom Candlesticks. Portable candlesticks of plain coloured pottery with a screening back are a good choice for bedroom use, as they protect the wick from draughts, and also serve to arrest grease splashes. Candlesticks in silver or other metal which have no special fittings such as these should possess a wide tray to catch any grease as it falls. A good deal of trouble in cleaning is saved if a flat glass disk, with a hole for the insertion of the candle, is placed on top of the candle stick.



Fig. 3. Left. Flemish brass double candlestick, 16th century.

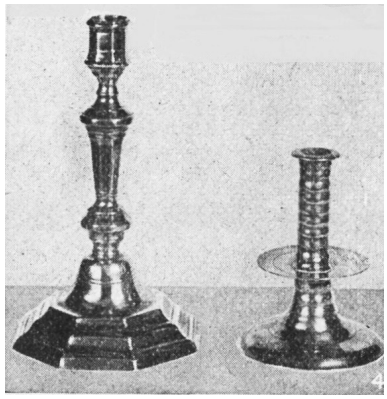
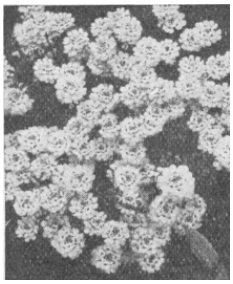


Fig. 4. English patterns: on left, late 17th century; on right, Cromwellian. (1-3, by permission of the Director, Victoria and Albert Museum).

CANDY. The accepted definition of this term is a sweetmeat made of boiled sugar, with numerous flavourings and colourings added. *See* Sugar Stick.

CANDYTUFT. The annual varieties of candytuft are favourite edging flowers for beds and borders. They are of various colours, crimson, purple, rose, lav-ender, etc. The plants are of the easiest possible culti-vation, and make a brave show for several weeks. Seeds are sown in April where the plants are to bloom in summer and the seedlings should be thinned to about 6 inches apart.



Candytuft. Flowers of the perennial Little Gem variety.

There are some charming flowers among the perennial candytufts. They look best in the rock garden, where they will drape the boulders with sheets of bloom in spring. They flourish best in well drained soil and should be planted in autumn or spring. The best sorts are Iberis sempervirens, garreyiana, and gibraltarica, all with white flowers. One named Little Gem is of compact growth and suitable for small rock gardens. Cuttings taken in June and placed in pots of sandy soil in a frame will soon form roots.

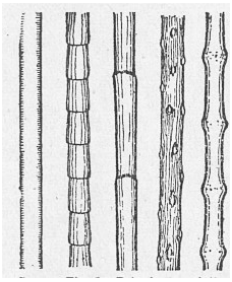
CANE: THE MATERIAL AND ITS USES

Hints on Making and Repairing Cane Furniture

Basket, Rush are other articles in this group. See also Armchair; Chair; Table etc.

By reason of its qualities of lightness and strength, cane has many uses in preference to wood, whether in the form of circular rod or split into strips. Large diameters of rod are used for the framework of light chairs and tables, for cricket bat handles, and similar purposes. Walking-sticks and fishing-rods are often of cane. Small canes are used similarly to willow for wicker-work articles. Naturally flexible, cane is still

more easily bent by soaking in hot or cold water, or by the application of dry heat, which prevents cracking and splitting when sharp bends have to be formed.



Cane. Fig. 1. Principal varieties of cane used for furniture.

The split cane is used for purposes where the whole cane would not be sufficiently flexible or would be needlessly thick. One of its chief uses is for the seats of chairs. It can also be very closely woven to form a kind of fabric. The hard outer skin gives great tensile strength to very thin and narrow strips. The interior, or pulp cane, is also strong, and is used in strips for winding round the nailed-together framework of cane chairs and other articles.

The woven fibre is manufactured into furniture, which shows to great advantage when coloured. Besides its use as garden furniture, woven cane of this type can be utilised in nurseries, bedrooms, and country living-rooms, as it can be procured or painted to tone with any colour scheme. The table illustrated is glass-topped in green glass to tone with shot green and gold paint used for the woven cane.



Cane. Glass-topped coffee table in Lloyd Loom woven fibre, and procurable in many colours.

Cane furniture has much to recommend it, for in addition to its durability it is easily and quickly cleaned. It does not collect dust so readily as upholstery, and may be washed with warm water and a scrubbing-brush, or with the garden hose. It is important that cane furniture should not be too springy, since the spring lasts only a short time, and in order to obtain it a good deal of strength has to be sacrificed.

The weight is another test of quality, the heavier furniture betokening a strong frame. When buying cane furniture special attention should be paid to the finish round the top and arms of the chairs, etc. In properly made cane all this is woven and has no plait or beading fixed on with tacks.

There are different varieties of cane, as seen in Fig. 1 The outer skin is retained for all purposes where strength is desired. The cane used for the back and seats of chairs is narrow strip, consisting chiefly of the outer skin, and can be bought from most basket makers and furniture repairers.

How to Re-cane Chairs. In the course of time chairs require re-caning, as the cane gets strained and slack and breaks in places. The new cane should be soaked in water for about 24 hours before using. This not only makes it more pliable, but it gets swollen by the water and dries and shrinks after the work is completed, and this strains it tighter than would otherwise be possible.

The work usually commences by removing the old cane from the seat. A portion may be cut out and kept as a pattern for reference in case there is trouble in lacing correctly. All round near its inner edge the seat has a row of holes, about 3/16 in. diameter, and ⅝ in. apart. In some of these wood pegs will be found wedging the cane, and these must be punched out. Commence the new lacing by putting in double strips of cane from back to front of the seat, the rounding or glossy side of the strips being kept uppermost. The strips pass beneath from one hole to the next. A steel awl and a number of tapering wood pegs are used for temporarily holding the cane at each hole, while it is strained across the seat to the next.

Then the lacing at right angles to this is put in similarly, except that it goes under and over alternately. This separates the double strips slightly. The next stage is to insert single diagonal strips. These also pass beneath the edge from one hole to the next. As seats are not square, it is not always possible to get geometrical accuracy around the edges, and canes must be put through the most convenient holes.

When all the lacing is done, alternate holes are permanently pegged, and an edging of wider cane is put round on top of the seat to cover the holes. It is pegged in at the corner holes, and tied down with cane at the alternate holes, which have not been pegged, the cane passing from one hole to another beneath the seat. Where lengths have to be joined the cane is tied with an ordinary knot.

CANE SUGAR. The sugar obtained from the sugar cane is also known as sucrose. It is found in various grasses, plants and trees.

It is an important food-stuff, not only from both the domestic and commercial points of view, but also because it is easily soluble, and, as a sweetening agent, renders foods more palatable and attractive. During the refining process molasses, treacle, and golden syrup are obtained, and at different stages the products are classified as loaf, castor, granulated, raw, moist or brown sugars.

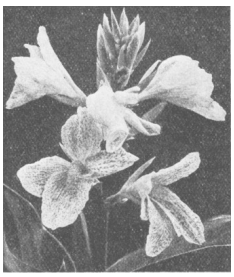
Cane sugar is rarely adulterated, the most general addition to it being a colouring matter to tint white crystals to resemble Demerara sugar. Sugar candy is the purest form of cane sugar. *See* Sugar.

CANKER: In the Garden. This disease affects fruit trees, chiefly apples and pears. Predisposing causes are undrained soil, careless or late pruning, or the attacks of insects. Frequently where a branch has been torn off by the wind or sawn off roughly, the bark fails to grow over it, and an entrance is left for the fungus spores. Apple canker is evident around the fruit spurs and as soon as it is detected the branch affected should be cut far back from it and burned. The fruit of cankered trees is often cracked and worthless. *See* Apple; Pear.

The term canker is sometimes used synonymously

with roup in fowls, but it is in reality a development of diphtheritic roup in its last stages. *See* Roup.

CANNA, or Indian Shot. These handsome plants may be grown in pots in the greenhouse or in flower beds out of doors in summer. The broad foliage is green, brown, or bronze, and the flowers are of many colours. Cannas are not hardy, and need to be wintered under cover. The strong, thick rootstocks form large masses, which can be taken out of the beds in autumn with soil adhering and stored in a frost-proof place for the winter. These dumps can be divided in spring. It is usual to pot each division, and to plunge the pots in bottom heat, but they can be started in a warm frame or greenhouse. When they have begun to grow they should be hardened off in a cold frame, and planted out after mid-May.



Canna. Brilliantly coloured flower spike and leaves of a garden variety of this handsome plant.

Much the cheapest way to raise cannas is from seed, which is the size of a pea and very hard. Germination is hastened by soaking the seeds in water for 12 hours, then sowing in a warm greenhouse. The seed may be covered with half inch of soil.

When grown in pots the plant needs a rich, porous compost. A mixture of three parts loam, one part leaf-mould, and two parts decayed manure, with plenty of sand, suits it. It should be well watered, and when the flower spikes push up, liberal doses of liquid manure should be applied.

CANNING. The value of canned goods in the home and the importance of suitable crop-production for canning should be realized.

Canning is a twofold process: first, the fruit or vegetables are sterilized and preserved; second, they are partially cooked to reduce the work of preparation for the table. There used to be a popular fallacy that all the "goodness" in foods was destroyed; with modern safe methods this has now been exploded. It is accepted that Vitamins A, B and E at least remain uninjured; and doctors recommend canned goods.

National Mark Canning. Today, through the scientist's skill, the housewife may serve fresh green peas and strawberries in December or all the year round. Fruit and vegetables canned or bottled under the National Mark are graded to standards of quality laid down by the Ministry of Agriculture. The Ministry's Leaflet H.S.4 and Bulletin No. 45, on which these notes are based, give much information on the subject.

Fresh-picked English peas are a popular example: owing to our climate, they are particularly good. Often they are canned and cooked within a few hours of being gathered. They are shelled, minutely cleaned, graded for size, scalded for flavour and tenderness, examined, sealed in brine, and cooked in steam at very high temperature, all by scrupulously hygienic machinery.

Appetising "stringless" beans, canned spinach, celery, beetroot, carrots, turnips, new potatoes and "macédoines" of mixed vegetables are other established varieties, to say nothing of the ever-popular "baked beans." Canned fruits include raspberries, strawberries, black and red currants, gooseberries, blackberries, loganberries, apples, cherries, and plums. Gooseberries are especially sweet, and make a good basis for fruit salads. Canned fruits are preserved in syrup.

Fruit Production for Canning. Related articles in this Encyclopedia should be consulted: the cultivation and food-value of fruits and vegetables are discussed separately. *(See* Apple, Celery, Raspberry, Pea, etc.) Home produce may be bottled for home consumption or, on a larger scale, supplied to a cannery under a definite contract. Some considerations are emphasized here.

Not all vegetables and soft fruits grown for the fresh fruit and vegetable market are suitable for canning. Some, such as the Victoria plum, the Sir Joseph Paxton strawberry, the Lloyd George raspberry, the Alaska pea, suit both demands; but in general crops must be grown specially for canning. Commercial canners want standardized grades of each product—quantity of unvarying quality. This should be remembered by both the home grower and the housewife who wants to buy reliable canned goods from abroad. A wide range of fruits is imported from Canada, Australia, South Africa and Italy. Note the preponderance of Empire crops; four-fifths of these are pineapples, peaches, pears and apricots. Berry fruits are mostly produced and canned in England. More canned home fruits will be eaten as the British housewife gradually realizes that they are as tasty and nourishing as foreign peaches and pineapples. Investigation shows that their popularity can be increased by good production and marketing.

English tomatoes are at present too juicy for successful canning, but breeding will probably alter this. Other experiments will eventually make most home fruits and vegetables "cannable." Meanwhile, canned "baked beans," peas and asparagus—besides such non-vegetable products as spaghetti—are ever-popular.

Plums are one of the most important home crops for canning. Victoria, Pershore and greengages are most suitable. Trees should be rid of pests according to the Ministry's Advisory Leaflets Nos. 34, 10, 302, and 367. Plums for canning should be picked in the "firm-ripe" stage, as should also damsons and cherries. Cherries are not so good for canning; some tend to lose their flavour, and the chemical action of the juice on the metal container is a technical difficulty. White cherries are dyed red in canning. Canned strawberries are good, though the supply of the right kinds barely meets the demand; this problem, however, is being solved.

Raspberries are good for canning, loganberries even better. Lloyd George and Pyne's Royal are the best raspberries for the purpose. Special care is necessary in picking, as badly crushed fruit is useless for canning. Loganberries are extremely popular for home production and consumption. Keepsake gooseberries and Baldwin black currants are also coming to the fore. (General information on berry cultivation is given in the Ministry's Bulletin No. 4.) Canned apples are good for tart-making: already peeled, cored and sliced, they are particularly useful in restaurants.

Vegetable Production. Peas are the most popular home-produced canned vegetable, and can be used in many ways. The cultivation of beans is dealt with elsewhere in this Encyclopedia. (See also Leaflet 152 of the Ministry.) Keeney's Green Refugee, and the ordinary kidney bean are best for canning. For Asparagus, see Bulletin 60; the Washington variety is most suitable. Canned celery has recently enjoyed great popularity, both braised and stewed (consult Bulletin 47). Canned carrots are excellent: small carrots used for forcing and "French gardening" are most suitable for canning, as a tender, delicately-flavoured type is required. For canning whole, stump-rooted varieties are preferred. Other canned vegetables are gradually achieving recognition, and research continues unceasingly. *See also* National Mark; Sardine; Tinned Food, etc.

CANTALOUP. A small ribbed variety of the musk-melon, it was originally cultivated at Cantalupo, near Rome, and so obtained its name. A good way of serving it is to embed it in crushed ice for 10 hours or more, then cut it in halves or thick slices, and remove the seeds, leaving on the rind. Serve with a lump of ice in each portion, and hand salt and fine white sugar, some people preferring to eat it with salt. *See* Melon.

CANTERBURY BELL. (Campanula medium). This is a great favourite among hardy border plants; if the dead flowers are picked off regularly the plants will bloom throughout the summer from early July. The Canterbury bell is useless after it has flowered, therefore a fresh stock of plants must be raised each year. Seeds are sown in May in a box of fine soil in a frame, and in due course the seedlings are planted on a reserve border; there they remain until October, when they are set where they are to flower the following year. Any plants which do not bloom then should be left undisturbed; they will form giant specimens the next year.



Canterbury Bell. Spray of lily-like flowers of this vigorous and hardy garden plant.

There are many varieties of Canterbury bell—single, double and cup and saucer flowers in purple, rose, lavender, white and other shades. All thrive in ordinary soil that has been well cultivated. Those who have no room for raising seedlings may buy plants in autumn or spring.

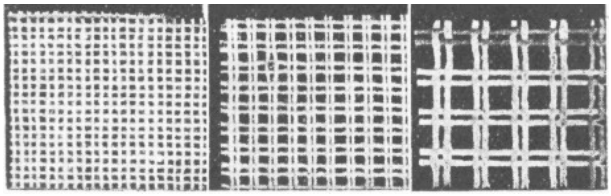
CANTHARIDES. The drug known as cantharides, or Spanish fly, is prepared from a dried beetle found in Spain, Russia, and Southern Europe. The beetle is about ¾ in. long and coppery green. Preparations used are the plaster, tincture, and an ointment.

Its intense irritant action makes the drug valuable for external use to produce redness or blistering of the skin, and so relieve deep-seated pain and inflammation, e.g. in such conditions as pleurisy and sciatica.

A mixture of one part of cantharidine ointment and two of soft paraffin is recommended as a pomade to stimulate the growth of hair. It should be discontinued for a short time if much irritation is produced.

In poisoning, give an emetic of mustard and water, and then white of egg. No fatty substances should be employed. *See* Blister; Hair; Poisoning.

CANVAS: Its Domestic Uses. Many different kinds are made, and the name is loosely applied to many rough, heavy plain cloths woven from hemp, flax, and cotton fibres. In packing-canvas nothing beats the old-fashioned hemp for durability, but it is so much dearer than jute-hessian that it is little used. Jute frays more easily than hemp and does not stand sunlight or damp so well.



Canvas for embroidery. Left, single-thread canvas; centre, double-thread or Penelope canvas; both actual size. Right, canvas used as the groundwork for wool rugs.

Green rot-proof cotton canvas, as used for cart and rick-covers, trunk coverings, boat and motor car covers, in addition to being waterproof is immune against insect pests, for its green colour is due to salts of copper. Sail-cloth and tent-cloth, both close-woven fabrics, and made from linen or cotton, are often called canvas; the linen kinds are the stronger and more expensive. What are known as tailors' canvases or paddings are used in basting, stiffening and inter-lining garments, and it is important that these should not shrink or stretch if the garment is to retain its shape. Canvases for interlining are made also in hair.

Artist's canvas is a special flax fabric made for oil paintings. Fancy cottons made in square and sometimes open-work weaves are described as canvases. Wool canvas is a rather open-textured fabric. Ordinary tarpaulin is a tarred canvas.

Double-thread canvas has two threads running vertically and two horizontally close together, so that there is a small square space between the threads. This canvas is employed for the coarser varieties of tapestry, and it is the chief groundwork for cross-stitch. When

stiffened it is used for tops of stools, and cushion covers, worked in silk and wool respectively. It is also used for bead purposes and bags. There are also two varieties used for homemade rugs, the first size with a mesh about ⅛ in. for ordinary rug wool, and the larger size canvas for cable wool. On the latter, though not much in use, home-made rugs can be made to resemble sheep-skin rugs. Finer embroidery is worked on single thread canvas. *See* Bead; Cross-stitch; Hessian; Waterproofing.

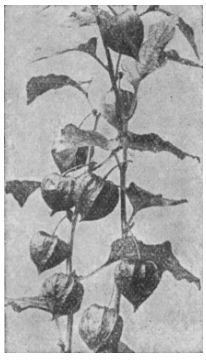
CANVAS SHOES. Canvas or stout linen is employed for making the uppers of a variety of shoes and also for cricket and sports boots. The soles of canvas shoes may be of leather, as in cricket shoes. In this case the canvas or linen drill should be of strong texture, and the soles should be made of well-tanned leather so that it will hold the spikes without bending or warping, a common fault with cheap-quality cricket shoes.

Canvas shoes for tennis and sports wear are soled generally with rubber, which is either attached by stitching or solutioned to the uppers. It is in this attachment of the soles to the uppers that the variation in the quality of plimsolls is most apparent. In a poor quality, cheaply made, the sole will frequently after a few days' wear part company with the upper, commencing by breaking away at the toe. It is a mistake to have canvas shoes tightly fitting. Not only does the canvas or cotton not stretch with the movement of the foot, as is the case with leather, but it actually contracts and shrinks when wetted. Rope-soled canvas sandals are worn for bathing.

In cleaning white canvas shoes the pipeclay should be wetted and a thin coating well rubbed in. Care should be taken not to soak the fabric too much or it will shrink in drying. They should preferably be dried in the sun.

CAPACITY. Electrostatic capacity is measured by the quantity of electricity which has to be transferred from one isolated conductor to another to produce a potential difference of one volt. The unit of capacity is the farad, and is the capacity of a condenser which requires a charge of one coulomb to increase its potential by one volt. A microfarad (mfd.) is one millionth of a farad. *See* Condenser; Dielectric.

Cape. *See* Cloak.



Cape Gooseberry. Fruit and leaves of Physalis Franchetti.

CAPE GOOSEBERRY. The true Cape Gooseberry is Physalis edulis, from South Africa, which provides edible fruits in that country. In British gardens other kinds are grown for the sake of their large orange-red ornamental "fruits" which cluster on stems about 2 feet high. These "fruits" are really enlarged calyces within which the true fruits are found. They are popularly known as Chinese lanterns, and are most decorative in the garden and in vases indoors when cut. Physalis Franchetti and Bunyardii provide the finest fruits. Both are hardy perennials suitable for planting out of doors in well drained soil and a sunny place. They may be increased by division in early autumn or by sowing seeds in a box of soil in a frame, or out of doors in spring.

CAPER. This name is given to the small, dull-green, unopened flower-buds of a trailing shrub which grows wild in Greece, N. Africa, and various parts of S. Europe. It is cultivated to a small extent in Great Britain.

The bud is picked long before the flower is ready to bloom, and the further it is from that stage the more pungent the condiment.

After the buds have been picked and left in vinegar for a time they are sorted into sizes by sifting them through sieves with meshes of varying sizes, then bottled and named accordingly, being classified as nonpareil, capuchins, capotes, etc. Capers are used for garnishing purposes and for flavouring sauces.

Caper Sauce. This may be either white or brown. To make the white sauce, melt 1 oz. butter in a small saucepan, add 1 oz flour, and cook them together for about 3 min. over a slow heat without browning them. Next add gradually a pint of hot stock, stir it till it boils, then cook it gently for 5 min. Take 2 table-spoonfuls of capers, cut them in halves, add them and 2 teaspoonfuls of caper vinegar to the sauce. Season it to taste with pepper and salt, and it is ready to serve. If the sauce is to be served with boiled fish, use fish stock.

For the brown sauce, take 1 pint of any good brown sauce, season it carefully with salt, pepper and grated nutmeg, and boil for 15 min. with 2 tablespoonfuls of caper vinegar and add to it one tablespoonful of halved capers.

CAPERCAILZIE. This game-bird is also called capercailie, wood-grouse, or cock-of-the-woods. For roasting it is first prepared and trussed as for a turkey or fowl, and inside is placed 4 oz. of raw beefsteak, which is taken out after the cooking and may be used in the preparation of patties, mince, etc. A few slices of fat bacon are laid over the breast of the bird, with slits cut in the rind to prevent them curling. The bird is then put in a baking-tin and roasted in the oven or before a clear bright fire for about one hour, with frequent basting with milk. When it is about three-parts cooked, remove the slices of bacon—save them also for some cold-meat dish—dredge a light dust of flour over the bird, baste it, and let it thoroughly finish cooking.

To serve, remove the skewers, strings, etc., pour round a few spoonfuls of clear, hot gravy, and garnish the dish with tufts of washed watercress that have been seasoned with a few drops of salad-oil and a little salt

and pepper. Extra gravy and bread sauce (q.v.) should accompany the bird. A bird will be sufficient for about seven or eight persons.

CAPON. This term refers to a cockerel, specially treated when young and reared for the table, not for breeding purposes. It becomes specially large, and is plumper and better flavoured than ordinary fowls. Capons are trussed and cooked in the same way as directed for fowls. *See* Boning.

CAPPINGS AND CORNICES

Some Typical Moulds and How they are Fitted

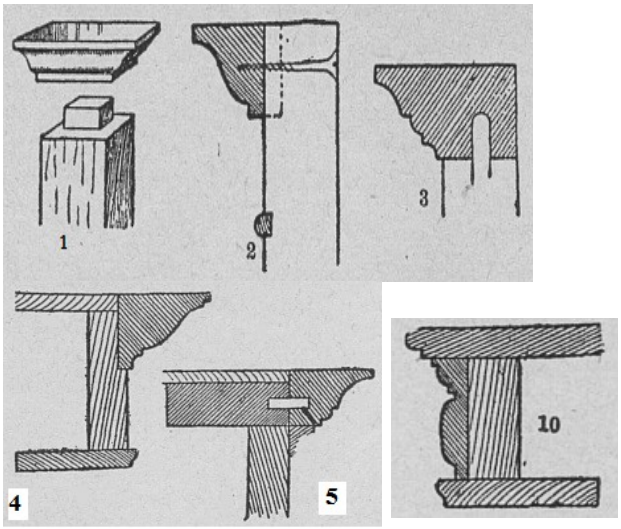
Such entries as Bookcase; Cabinet; Cupboard may usefully be read in association with the one below.

See also Dowelling; Moulding

When setting out an article which is about to be constructed, special regard must be paid to the importance and finish that a suitable capping or cornice is capable of imparting to the assembled effect. Too frequently any section that may be ready to hand is worked in without the slightest attention to its suitability.

In fitting cappings, these may be finished with plain square edges, or the edges may be rounded, nosed, or thumb-moulded; or, again, the edges may be beaded or have a bevel taken off the upper or lower edge according as this is below or above the edge when fixed in position. Generally speaking, however, a three or more membered mould will give a distinctly enhanced effect. The simplest form of capping is that used as a terminal finish for posts, and frequently employed in the construction of bedstead ends. As indicated in Fig. 1, the caps on a 2 in. by 2 in. post finish about 4 in. by 4 in. square by ⅞ in. thick with a flat top. This portion is improved by a raised and rounded finish, for which purpose a 4 in. by 4 in square of ¼ in. thickness is glued on to the flat, or the detail can be finished from material 1⅛ in. thick net. These cappings are best fixed with a stub tenon cut on top of post to enter a corresponding mortise in capping, but three small dowels can be utilised instead. One dowel is a mistake, as the capping will be liable to twist out of the square.

The capping mould, often seen at the back of a hall table or dinner wagon or on the top of a washing-stand back, is sometimes fixed to the face of the rail, and in other instances (when below the level of the eye) is fitted to the top edge of rail. In the former case it may be glued and pinned into position, but is better screwed from the back (Fig. 2), and either mitred or returned on itself at ends with the chisel. Better work may have the section rebated into the face of rail, as indicated by dotted line. When fitted to top edge, the capping is dowelled on as Fig. 3, flush at back, and with a projection of ¾ in or ⅞ in. at front, according to the section in use. The bead grooved in below the capping mould in Fig. 2 is often added when a shelf is not provided above the tiles or marble panel of a washstand back. If well above the eye, the capping (Fig. 3) might be screwed instead of being dowelled into position.



Capping. Pattern described in the text, showing in section methods of attachment and other details (By arrangement with Evans Bros., Ltd., London)

Methods of Fixing Moulds

The cornice mould of a well-made article of minor dimensions would probably be worked on the edges of a solid top of ¾ in. or ⅞ in. thickness, whilst in common, hastily constructed work it is often merely glued on or pinned on. A neat method is that indicated in the section, Fig. 4. The mould is let into the frieze rail about ¼ in., and a ⅜ in. top fitted into the rebate formed by the rise of the mould beyond the top edge of rail. Another method is shown at Fig. 5, the mould being tongued to a lining slip behind it to form a rebate for a dustboard to drop in and be screwed. Either of these methods could be applied to a wall cabinet as well as to cupboards of larger size.

In some forms of cabinet work the cornice and frieze may be built up in the manner indicated at Fig. 6, the top being housed into the frieze rail, and the frieze mould mitred at corners out of slips about 2¼ in. by ¼ in., glued to under edge of frame. Stock moulds may be

obtained from the furnishing wood yards, the whole section of which, as at Fig. 7, is cut out of 1 in. material or less, to be glued into position on the cornice framing.

Such a section is sometimes completed by glueing a lining slip behind in the angle formed by the pitch of the mould; in other instances it will be held by angle blocks at intervals of 9 in. or so apart. The top is shown as screwed down to the framing, and the method with lining slip is suitable for an article such as a china cabinet. Below eye-level a solid ⅜ in. or ½ in. top to overlap had best be provided, to be glue-blocked under into position. The entry-holes of screws are unsightly, and, even when well-stopped, tend to show through the surface finish owing to shrinkage of the wood.

Another fixing for the upper mould is that given at Fig. 8, the top being made to project beyond the carcass sufficiently to cover the pitch of the section below it, which is glued into position above and below. Such a section would be suitable for a dwarf linen cupboard of Jacobean type, or could be adopted in the construction of a mantel.

An instance of a solid top mould is given at Fig. 9, the rail under being rebated to receive a lining flat of ⅜ in. material or so, thus extending the mould with a sort of frieze effect. Framing and top are glue-blocked behind, and the section is very suitable for an oak cupboard. In the section at Fig. 10 this method is developed, the arrangement being useful where it is desired to achieve a carved frieze effect after the Jacobean style.

Attachment of Loose Cornices

Loose cornices separately made to be easily detachable from bulky pieces of furniture (such as a wardrobe) are usually fixed into position by means of glued blocks on the upper part of carcass. Cornice and frieze moulds are mounted upon a separate framing. In cheap work the framing may be found to be merely mitred and nailed together at front and sides, with a glued block in the inner angle. A back rail is nailed and glue-blocked at back to hold the whole thing square, a stretcher rail being also similarly fitted in centre. The cornice mould is glue-blocked into position and nailed, and a dustboard is usually omitted, as indicated in the part plan (Fig. 11).

A sketch of a loose cornice is given at Fig. 12, showing it in position on wardrobe carcass as viewed from above. Height over all may work out at 4½ in. to 6 in., according to detail. The method of dovetailing front and side rails of framing is given at Fig. 13, and from this it will be seen that the mould is mounted higher than the front and side rails to form a rebate for the dustboard top. The side rails have the back rail fixed to them by means of a housed dovetail, and the stretcher rail between front and back rails by means of a dovetail into each. If properly done the whole thing should be thoroughly firm when glued up. The through-dovetailing is masked by means of facing slips of the hardwood in use (¼ in. thick or so), glued on after mitreing at corners. The width of these slips is determined by the height of the cornice mould which beds upon the top edge of them.

Another effective method is to pitch the cornice high (Fig. 14) and rebate it to receive the dustboard.

When fixing a cornice mould, in cramping up after glueing it will be necessary to use a suitable block to fill the space caused by the pitch or projection of the members between the jaws of the hand-screw. Where the flat member, often dentilled, exists a square slip of necessary size will suffice, but in other cases it may be necessary to scribe the block to prevent it slipping when pressure is applied. It may be found that use can be made of a spare cut of the mould in use for that purpose, possibly with a layer of felt between to avoid bruising any points of contact.

CAPSICUM. This plant is grown for the sake of its red and yellow fruits, so much in demand for pickles and flavouring. It is raised from seeds sown in a heated glasshouse in March; the seedlings may be grown in 6-inch pots or planted out of doors in a sunny place in June. They flower in July, and yield pods ready for picking early in September. They are very ornamental when in full fruit.

Chilli or Chili pepper is obtained from capsicum, and cayenne pepper is the ripe fruit dried and ground. Fresh red or green chillies are procurable at certain seasons. Capsicums are sometimes stuffed with forcemeat and served as a savoury. *(See* Cayenne; Chilli.)

In medicine capsicum is valuable because it stimulates the flow of salivary and gastric juice, thus promoting appetite and digestion, and correcting dyspepsia. It relieves flatulence, and ⅛ to 1 grain may be given in a purgative pill to prevent griping. For these purposes the tincture may also be employed in doses of 5 to 15 minims, in a mixture.

For chilblains one may rub on either capsicum ointment or the B.P.C. stronger tincture of capsicum; but these preparations should not be used if the skin is broken. The liniment of capsicum may be used in painful affections like lumbago and sciatica. Capsicum wool and capsicum gamgee tissue act like thermogene and are warm and stimulating.

CARAFE. Glass water-bottles for bedroom use have a tumbler to match. Bottles or carafes of old green and wine-coloured glass, with old-fashioned stoppers, are obtained or copied for table use. For cleaning the carafe, shot, which may be bought at any oilshop, pieces of charcoal, or of raw chopped potato with warm water, may be shaken in the carafe. For rinsing, cold water must always be used. *See* Glass.

CARAMBOLA. This is the fruit of an evergreen tree widely grown in India. The fruit is yellow, about the size of an orange, and full of juice, but acid. It is eaten as a preserve.

Caramel. *See* Browning; Toffee.

CARAMEL PUDDING. Both the custard and the rice caramel puddings given here are popular with children, and very wholesome To make the first, put ¼ lb. lump sugar and ¼ pint water in a small saucepan, and let them boil until the mixture turns a golden colour like toffee. Pour it quickly into a plain dry mould, coat the inside of it all over by turning the mould round, and then leave it until it is cold. Put 4 yolks and 2 whites of eggs in a basin and beat them, frothing them as little as possible.

Bring ½ pint milk to boiling point. When it has cooled slightly, pour it gradually on to the eggs, and add to the mixture a tablespoonful of castor sugar and a few drops of vanilla. Strain this custard into the mould, covering the top with buttered paper. Steam the pudding very slowly for about an hour or until it is quite set. The water should hardly bubble, for unless the custard is cooked very slowly, it will be full of holes and spoilt.

If the pudding is to be served hot, let it stand for a minute before taking it out of the saucepan. Then turn it very carefully on to a hot dish. If it is to be served cold, let it stand for an hour or more before turning it out. If preferred, 3 whole eggs can be used instead of 4 yolks and 2 whites.

Sugar, rice, milk and eggs are the ingredients for a more substantial caramel pudding. Make the same quantity of caramel mixture as is given in the first recipe, and with it line a plain mould thoroughly.

Put 2 oz. rice in a saucepan with a pint milk and let it simmer very gently for about an hour until the rice is tender and has absorbed the milk Next beat up 2 eggs, add them and 1 oz. sugar to the rice. Turn the mixture into the prepared mould, twist a piece of buttered paper over the top, and steam the pudding for about three-quarters of an hour. Then turn it out on to a hot dish, when the caramel will run all round the dish like sauce.

CARAMEL SAUCE. Put 1 oz. loaf sugar into a steel pan, or one not lined with tin, and let it melt and cook till it is a rich brown. Add ½ pint water and 6 oz. more sugar, and boil these until a little forms a strong thread between the thumb and finger when tested. Flavour with vanilla, and stir in a teaspoonful of cornflour mixed thinly with cold milk. Stir and boil for five min., then strain it. It should be served with hot puddings.

CARAT. Carat is a term used by goldsmiths as a measure of purity of gold. Fine gold is 24 carats; 22 carat is 22 parts gold and 2 parts alloy, either copper or silver or both; 18 carat is 18 parts gold and 6 parts alloy, and so on down to 9 carat; 8 carat and 14 carat are not recognized in England.

CARAVAN. The horse-drawn caravan is largely used for holiday tours, while a lighter type is towed by a motor-car. Caravans used as permanent residences are in many places subject to special by-laws. *See* Holiday; Motor-Car; Sanitation; Tent.

CARAWAY. The seeds of the caraway plant, with their strong aromatic flavour, are used for flavouring cakes. The essential oil of caraway seeds forms important ingredients in various tonics, condiments, wines and cordials. *See* Seed Cake.

CARBIDE. The chief use of carbide of calcium is in the production of acetylene gas.

Carbide can be bought in ½ lb. and 7 lb. tins, and in iron drums or barrels holding from 28 lb. to 2 cwt. It greedily absorbs moisture, and will take it up out of the atmosphere. Hence, when a drum is once opened it is advisable to empty the entire contents at once into some form of special storage bin with an airtight lid. If the storage bin is not closed properly a white, powdery crust will form on the top of the carbide; this crust is, of course, so much waste.

As acetylene gas is explosive, and may be given off accidentally or without being noticed from a store of carbide, a licence to keep carbide must be obtained from the local authority if it is desired to store more than 28 lb. at a time. *See* Acetylene.

CARBOLIC ACID. The drug is generally used in the liquid form. It is used as an antiseptic, and at the same time relieves pain, but if employed as the liquid acid, or if lotions are too strong or left on too long, the skin and other tissues are destroyed.

Carbolic acid lotion may be in the strength of 1 in 20, 40, 60, or 100. If the lotion is made at home, hot water should be used in order to ensure thorough mixing; and the lotion should be kept in a poison bottle. It may be used for washing wounds or sores, but is also applied on lint or gauze which has been wrung out of it. When the dressing is to be covered with gutta-percha tissue or oiled silk only the weaker lotions should be used. The 1 in 100 lotion may also be used as a gargle in sore throat and usually brings much ease, but it should not, of course, be swallowed. This strength could also be sponged on the skin to relieve itching.

Carbolic oil is often used for burns, but to be useful it must be fresh. The glycerin of carbolic acid is better, and this is also a useful application in boils and carbuncles. A few drops of this instilled into the ear may be helpful in relief of pain.

Lozenges and pastilles may be obtained from the chemist for use in sore throat or septic conditions of the mouth. If a little cotton-wool be rolled on the end of a match and dipped in the liquefied acid it may relieve toothache if it is gently rubbed round a cavity in a tooth. Someone should do this for the sufferer, and should use cotton-wool or a rag to protect the cheek and gum.

Poisoning by Carbolic Acid. In poisoning there is intense burning of the throat and mouth, whitening of mouth and lips, and the characteristic smell of the poison. The doctor should be sent for, and in the meantime 1 oz. of Epsom salts dissolved in a tumbler of water may be given, with demulcent drinks later.

Sometimes symptoms of carbolic acid poisoning,

noted chiefly by a sudden darkening of the urine, may develop when large skin surfaces are being treated with carbolic acid antiseptic dressings. Here the treatment consists of the immediate substitution of some other antiseptic for the carbolic, and the taking of half a teaspoonful of Epsom salts in half a wineglass of water four times a day.

Household Uses. The chief use of carbolic acid in the ordinary household is as a disinfectant, and for that purpose it remains a favourite, although a good grade of coal-tar disinfectant is much more efficient, besides being relatively non-poisonous.
Carbolic acid should always be kept in a labelled bottle and in a locked cupboard, owing to its poisonous nature.

For use a 1 in 20 solution is convenient, and this is made by adding about 4 oz. of the pure carbolic acid into a ½ gallon of water, and shaking up well.

In cases of infectious illness, all infected bed-linen, blankets, and underclothes should be soaked in this solution for about 12 hours before being washed. The spreading of colds would be lessened if all soiled handkerchiefs were similarly treated before being washed.

The sheet hung over the door of the sick-room in cases of infectious illness is frequently moistened with carbolic solution. When required the fluid may be used in a scent spray for freshening the air of the sick-room. Floors which have been soiled with infected material should be washed over with the carbolic solution. For sweetening drains, sinks, and water closets, the solution should be swilled over the appliance, and allowed to remain in contact for two hours. *See* Disinfectant; Poisoning.

CARBOLIC SOAP. Carbolic soap consists of an ordinary soap to which a small proportion of carbolic acid has been added, but it actually contains so little of the acid that its disinfectant action is small and must not be too greatly relied upon. Carbolic soap has, however, a definite use. The smell is particularly wholesome and cleanly and will replace offensive odours.

CARBONIC ACID. Carbonic acid gas is given off in breathing, combustion, fermentation, and putrefaction. The proportion of the gas in pure air is about 4½ parts in 10,000; more than this can be tolerated, but if the amount in the air of a room exceeds that limit, drowsiness and faintness are produced. *(See* Ventilation.)

Aerated waters are charged with carbonic acid gas, which process gives them their piquancy.

Poisoning by carbonic acid gas occurs sometimes when people sleep close to lime kilns, when a charcoal or other fire is lighted in a room without a chimney, in the holds of ships, and especially in coal-mines by the after-damp or choke-damp. A condition of asphyxia is produced. Remove the patient to the open air without delay; practise artificial respiration, and if possible give oxygen. If the patient recovers, the effects of the poisoning soon pass away.

CARBONIC ACID SNOW. This is one of the most successful agents for removing birthmarks, warts, and for the treatment of lupus and other skin affections. It is prepared from liquefied carbonic acid gas, and the snow should only be applied by a doctor.

CARBONIC MONOXIDE. Known also as carbonic oxide, this is a highly poisonous gas present in ordinary coal and water gases. It is also formed when any substance is burned in a quantity of air insufficient for complete combustion. Coke and charcoal stoves some-times give it out in dangerous quantities. A slight escape of gas in the house may gradually produce symptoms of carbonic oxide poisoning.

There is a considerable percentage of carbon monoxide present in ordinary coal gas, and the greatest care should be taken to see that all gas connexions and fittings are absolutely gastight. The action of the gas when breathed in is to form a compound in the blood which ultimately ends in asphyxia. The gas burns with the characteristic blue flame which is seen in a very hot fire or charcoal stove. The formation of carbon monoxide in this way, indeed, has been a very frequent cause of death where charcoal has been burnt in rooms which are insufficiently ventilated.

No brazier or similar heating apparatus should ever be used in a closed room. For a similar reason, the use of a geyser in a bathroom is dangerous unless adequate ventilation is ensured.

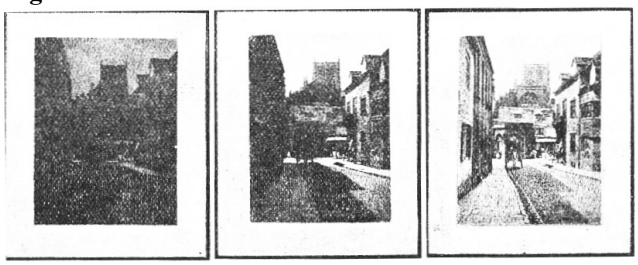
The gas is not readily displaced from the blood by oxygen; hence resuscitation by artificial respiration is sometimes very difficult. The symptoms are great weakness, a throbbing headache, nausea, and giddiness. Later there may be convulsions and then unconsciousness. Send at once for the doctor. Until he arrives practise artificial respiration. This may often have to be continued for several hours. *See* Artificial Respiration.

CARBON PAPER. Prepared with carbon, or other material, so that it reproduces on paper or other substances placed beneath it a copy of any design or outlines, it is chiefly used in typewriting to obtain a duplicate, and for a similar purpose when the writing is done with pen or pencil. Other uses include the transference of a design on paper to the surface of some other material such as wood, leather, or canvas, which has subsequently to be modelled, shaped or worked upon. The carbon paper used for typewriting purposes is not so sensitive as that for pencil use, as the force of blow struck by the type face is considerably greater than the pressure exerted in hand writing.

Pen copying carbon paper is very clean in use and produces excellent duplicates, when the original is written with a fairly fine or hard nib. The best results are obtained from carbon papers by keeping them flat and free from dust and excessive warmth, which tends to dry them up. *See* Typewriter.

CARBON PRINTING. This is a process of making photographs from ordinary negatives on sensitive tissue. This tissue consists of paper coated with a mixture of gelatine and a pigment, some 30 different colours being available. The tissues and other carbon materials are made by the Autotype Company. It is best for the amateur to buy the tissue ready sensitised.

In making a print, the tissue is exposed (behind the negative) to daylight. The negative must have an opaque border, made by pasting narrow strips of black paper round its edges. As the tissue is of deep colour, the action of light upon it cannot be seen; it is necessary to ascertain the required time of exposure by means of an actinometer. From the appearance of the negative it is fairly easy to judge how many sections of the P.O.P. must be exposed in succession to match the tint in order to give the correct exposure to the tissue under the negative.



Carbon Printing. Three stages in development, the picture being then ready for hardening and rinsing.

The action of the light on the tissue is to make part of the gelatine insoluble in hot water. Unfortunately, the action of light is chiefly on the surface of the tissue, which becomes covered over almost all parts with a skin of insoluble gelatine.

The varying amount of insoluble gelatine which, with the pigment held fast by them, will finally form the picture lie underneath this skin, together with all the soluble gelatine which is to be dissolved away.

Transferring the Tissue Coating

The tissue coating has just to be transposed to another piece of paper, so that the soluble parts are on the surface. This is done by soaking the exposed piece of tissue in cold water along with a piece of transfer paper, which is paper coated with hardened gelatine. After soaking for a minute or two, the dark surface of the tissue and the gelatine surface of the transfer paper are brought together under the water, then laid on a sheet of glass or other flat surface, and pressed together with a squeegee, which is a stout strip of rubber mounted in a wooden handle. The two sheets are then left for about 15 min., and the print is then ready to be developed.

The developer is simply water at a temperature of about 100° F, On soaking the pair of papers, which have been squeegeed together in this hot water the mixture of gelatine and pigment soon begins to ooze out from the edges. As soon as this is seen to be taking place the original paper of the tissue can be readily stripped away, leaving the picture, as yet invisible or very nearly so, on the transfer paper. On further soaking in the hot water the dark coating of pigment dissolves away revealing the outlines and light and shade of the picture. It is best to assist the process of development somewhat by pouring hot water over the print from a cup. In this way parts such as heavy shadows may be lightened by extra treatment, or by using slightly hotter water. In all, development should not require more than 5 to 10 min. When the picture is seen to be of the correct depth and clearness in the lightest parts it is laid carefully, face up, in a dish of cold water, and is then soaked for about 5 min. in a hardening solution made by dissolving 1 oz. of alum in 20 oz. of water. A washing of 5 min. in running water is given before drying.

Owing to the transfer of the tissue coating to a fresh support the picture obtained from an ordinary negative becomes reversed. This may be overcome by making a reversed negative, or, in the case of film negatives, by printing with the tissue in contact with the plain side of the negative.

Carbon prints are of a very high degree of permanence, since only permanent pigments are used in making the tissues. Moreover, the only chemical, bichromate, is very completely washed out in the hot developing water. For good results on bought tissue, negatives of good contrast and quality are necessary. *See* Negative; Photography.

CARBORUNDUM. A manufactured article composed of silicon and carbon, carborundum is used as an abrasive in the form of wheels, flat slabs or stones, and in various other shapes suited to the sharpening of many kinds of tools and appliances. Carborundum powder is made in various grades, and is a splendid grinding compound.

It is also obtainable in the form of a sheet or cloth, the carborundum being applied to it in the same way as emery cloth. Long strips of this material, made in the form of an endless belt, are used for grinding small articles or cleaning the scale from a casting.

A carborundum combination sharpening stone is a handy form of oilstone, as it has a coarse face for rapid cutting on one side and a fine face for whetting on the other.

Carvers' slips for the sharpening of gouges and other carving tools, and the points, slips, and sticks of different shape are invaluable for finishing off dies or any small, accurate metal work, as they can be used as a fine file.

When using carborundum powder or cloth remember that it is an excellent abrasive; therefore, when the work is finished, every care must be taken to see that all trace of the powder is cleaned off the work.

CARBRO PROCESS. The Carbro process is a method of carbon printing which is very much simpler to work, yet yields results identical with those of the carbon process. In it pigmented paper of any of the large variety of colours used in carbon printing is exposed, not to light under a negative, but simply to

contact with a bromide print or enlargement after having been soaked in a certain mixture of chemicals.

The action on the coating of gelatine and pigment is that they are rendered insoluble proportionately to the silver in the bromide print.

This form of carbon printing has several very positive advantages. There is no need for daylight; the whole process, including the making of the bromide print, is done by artificial light. There is no reversal of the drawing of the picture, but at the same time a reversed picture can easily be made.

For working the process two stock solutions are required. The following is the stock solution A for the sensitising bath:

Potassium bichromate	1 oz.
Potassium ferricyanide	1 ,
Potassiuln bromide	1 „
Water	20 „

The stock solution B for the acid bath is made up as follows:

Acetic acid, glacial	1 oz.
Hydrochloric acid, pure	1 „
Formaline, solution as sold	22 „

The sensitising bath is made by mixing some of the A solution with three times its bulk of water. The acid bath is made by adding 1 oz. of the B solution to 32 oz. of water. The sensitising bath may be used a large number of times in succession, but it is best to throw away the acid bath after each day's use. To make a carbro print, a sheet of pigmented paper is immersed in the sensitising bath and turned over once or twice in about 3 min. Meanwhile a bromide print should have been soaking in clean water. There is nothing special about the bromide print except that it should be printed with a white margin. If it is not made with this margin, the sheet of pigmented paper must be about ½ in. larger than the bromide print.

At the end of 3 min. the pigmented paper is drained from the sensitising bath and laid face up in the acid bath, where it is allowed to stay for a time ranging from 15 to 25 sec. The longer time of immersion yields carbro prints of less contrast. While the pigmented paper is in this bath, the bromide print is taken from the water and laid face up on a level sheet of glass. The sensitised pigmented paper is then taken straight from the acid bath and laid, coated side down, upon the bromide print. The two are immediately pressed into contact by means of a squeegee. The pair of papers is then placed between sheets of greaseproof paper and allowed to remain in contact for about 15 min.

Special Method of Developing

During this time a sheet of transfer paper is soaked in clean cold water, and when the 15 min. have expired the pigmented paper and bromide print are gently pulled apart, and the former laid, coated side down, on the transfer paper, squeegeed into contact and left between blotting boards for about 20 min. At the end of this time the original sheet of paper which was coated with the pigment is stripped away, by immersing the pair in water at about 100° F., leaving the picture on the transfer paper, though hidden in the mass of pigment. The further development of the picture is exactly the same as in carbon printing. The bromide print undergoes a bleaching action by contact with the sensitised pigmented paper. It is washed in several changes of water for half an hour, and then restored to its original state by placing it in an ordinary developer, such as M Q or amidol. After a further wash, the bromide print may be used at once for making other carbro prints, or be dried for future use. *See* Carbon Printing.

CARBUNCLE. The commonest sites for a carbuncle or local gangrene of the tissues underlying the skin are the back, the nape of the neck, the shoulders and the buttocks. A carbuncle may be an inch or more in diameter, is inclined to spread, and in the later stages has three or four openings in its surface leading down to the core.

A carbuncle is most likely to occur in one who is in a debilitated and generally run-down state of health, perhaps as the result of chronic disease or of living in insanitary surroundings or of insufficient food. A blow or a squeeze may be the exciting cause. A typical carbuncle begins as a hardish, painful swelling under the skin. Soon it becomes softer and doughy, and then later the purplish red skin gives way, and the core may be seen beneath as a greyish white slough.

A carbuncle requires immediate treatment at the hands of a surgeon. *See* Boil.

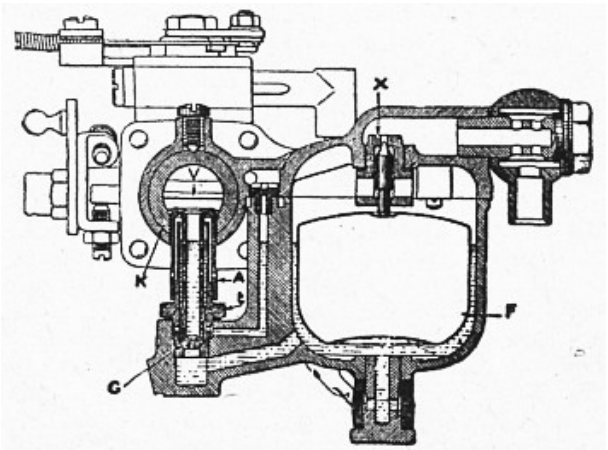
CARBURETTER: Details and Working.

A carburetter is a device used on internal combustion engines to ensure a proper explosive mixture in the engine. Broadly speaking, for petrol an explosive mixture consists of one volume petrol vapour to twenty volumes of air. Should the mixture be too strong it will not explode rapidly, thereby creating loss of power in the engine, as well as causing the engine to get unduly hot. On the other hand, should the mixture be too weak, the resultant symptoms would still be the loss of power, but probably accompanied by popping in the silencer, caused by late firing of the weak mixture.

With few exceptions, the method of producing an explosive mixture is carried out by spraying the petrol from a fine jet, by drawing the air at a high velocity through a choke tube, in the centre of which this jet is placed. The suction is due to the fact that the pressure of the air at the restricted part of the passage, that is the choke tube, is decreased at the same time that the velocity is increased. The petrol as it issues from the jet into the stream of air is broken up into very fine globules. Fig. 1 shows the main parts of a simple carburetter.

To obtain perfect carburation at all engine speeds is not easy. A rich, slow-burning mixture is necessary for starting and slow running; a slightly rich, quick-burning mixture when accelerating, and a fairly weak mixture for fast running on the level.

mixture for fast running on the level.



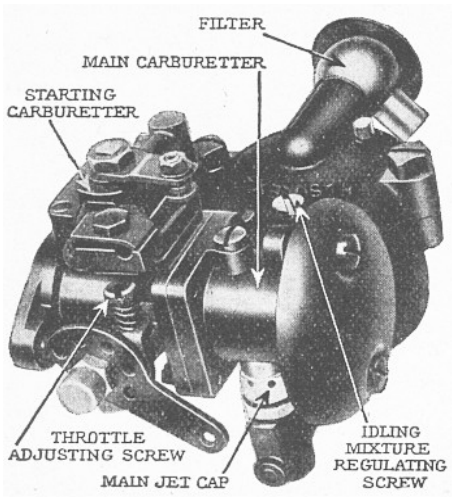
Carburetter. Fig. 1. Part-section view of Solex carburetter showing float (F) in float chamber, needle valve (X), main jet (G), jet carrier (t), jetcap (A), hoke tube (K) and butterfly throttle (V).

Carburetters, as a whole, may be said to be of either the single or multiple jet pattern. With the former one main jet is employed to serve the demands of the engine at all engine speeds, the pilot, or slow-running jet, only coming into operation when the throttle is closed. The necessary adjustment of the mixture to the needs of the moment with the single-jet type is usually provided for by means of the throttle, which is so arranged that more air is admitted at high engine speeds.

The multiple-jet carburetter is one in which two or more jets are so arranged as to be uncovered one at a time, by the opening of the throttle, as more power is wanted. Another popular type which may be said to be closely allied to the multiple-jet family is that in which the proportioning of both the air and petrol are automatically controlled, an ordinary butterfly throttle being employed to govern the engine speed. Briefly, this type has a tapered needle which fits into the petrol orifice, the base of the needle being secured to a piston valve; this valve also covers the air port of the carburetter, and is operated by the suction of the engine, which is so arranged as to create a vacuum at the back of the valve, thereby drawing it off its seating more or less as the engine speed varies.

Modern carburetters are of the horizontal, up-draught or down-draught type. In the horizontal pattern the mixture passes to the induction system of the engine through a horizontal passage, while in the up-draught or down-draught design the mixture is drawn into the engine via a vertical passage in an upward and downward direction respectively. Each type has its advantages which relate to accessibility, ease of attachment, fuel economy and running efficiency.

As a general rule carburetters fitted to motor cars are equipped with an air cleaner, the purpose of which is the filtration of the air before it enters the engine. The cleaner, having a felt or gauze element, extracts minute particles of grit and other foreign matter suspended in the air stream and so reduces wear in the cylinders and minimizes the formation of carbon deposit. Frequently the air cleaner is combined with a silencer so that noise caused by the air stream as it enters the carburetter is materially reduced.



Carburetter. Fig. 2. Solex "self-starting" carburetter incorporating a separate carburetter for starting purposes. (Courtesy of Hillman Motor Car Co., Ltd.)

Some types of carburetter are equipped with a device for injecting an additional supply of fuel to the engine during the acceleration period, so that a rapid pick-up is obtained. The mechanism usually takes the form of a small plunger pump which works against the action of a spring. It is brought into action by the accelerator pedal to which it is interconnected. On depression of the pedal the pump forces fuel through a special jet into the air stream passing through the carburetter, and this extra supply gives additional power, and instant response from the engine ensues with rapid gathering of speed.

Carburetters which are known as the "self-starting" type are of normal construction, but have an auxiliary carburetter formed in the main body. Comprising a secondary mixing chamber with a petrol jet and air supply, this auxiliary carburetter is so arranged that it provides a mixture of sufficient richness and volume to ensure an immediate start from cold. This rich mixture, however, automatically decreases as soon as the engine is running, so that economical consumption of fuel is maintained.

When tuning a carburetter, the same results may be obtained by different methods. A weak mixture may be corrected by fitting either a larger jet or a smaller choke tube. Whether the former or the latter will result in giving as much power with petrol economy will be found by test. Broadly speaking, a change of jet is preferable to a change of choke tube, because the latter may seriously restrict the area called for by the particular engine being dealt with.

Further, as the air velocity would be much higher with a small choke tube than a large one at a given engine speed, it follows that the suction on the jet would also be greater. On the other hand, should the mixture be too rich, which is traceable by heavy petrol consumption and a hot engine, always try a larger choke tube first.

Carburetter Troubles. These are generally due to partial or complete stoppages caused by dirt choking up the gauze filter or the jets themselves; tracing and curing such troubles is a simple matter. Fuel supply from modern pumps with highly efficient filtering systems has greatly reduced the occurrence of dirt in petrol tanks and carburetters and its consequent troubles.

Water in the carburetter generally produces a complete stopping of the engine. Flooding at the jet may be due to dirt, wear of the needle, or a punctured float. *See* Bowden Control; Motor Car.

CARDAMOM. The small dark brown capsules of an E. Indian plant known as cardamoms are highly prized in tropical countries as a condiment for flavouring curries and also sweetmeats. In Europe they enter into the preparation of numerous curry powders, cordials, sauces, and for spicing cakes.

Cardan Shaft. *See* Propeller Shaft.

CARDBOARD. Strips of thin cardboard will serve instead of wood to light the fire. An old hatbox packed with hay, straw, or sawdust makes an excellent hotbox in an emergency.

CARDOON. Closely related to the globe artichoke, the blanched stalks and main root of the cardoon are eaten instead of the undeveloped flower-head. It is hardly suitable for small gardens, but in large ones it is often grown in trenches like celery, but given more room. The trenches should be larger, and be 4 ft. apart, with the plants 3 ft. apart.

The seeds may be sown under glass in March and the plants put out in May. Another way is to sow in the open ground in April for the current year's yield. The plants are generally strong enough for blanching in August, when the leaves are drawn together, bound round with straw to the tips, and covered with earth. They blanch in about two months. Recipes suitable for cooking celery (q.v.) may be used for the cardoon.

CARDS: For Visiting. Visiting cards should be stamped with a copper-plate die in script. A usual size is 3½ by 2½ in. for ladies, and 3 by 1½ in. for men. The name, placed in the middle of the card, is prefixed by the title (if any) or Mr., Mrs., or Miss. An address and telephone number may be put in the left-hand bottom corner, if desired, and should be in a smaller script.

Cards are not sent in upon arrival at a house for a visit, except in business interviews. On leaving after a call has been made, a lady may leave on the hall-table one of her own cards and one of her husband's, or of any male relative with whom she resides, e.g. her father or son. If her hostess is married or has a male relative living in the house, the caller may leave two of her husband's cards as well as her own.

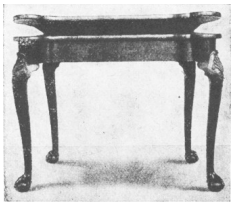
When no call is made, cards may be left at the door upon the following occasions. After invitations to a formal dinner, dance. At Home, or any similar function; if the lady of the house is not at home when a call is made; when one is inquiring in cases of illness: and to intimate a change of address.

Business cards may have the profession or trade in brackets under the name, with some essential details, which, however, must be few and as short as possible. The name of the newspaper, in the case of a journalist, or of the firm with which the owner of the card is connected, may be put upon a card.

A very narrow black edge may be used upon the card to indicate mourning; but this is no longer usual. *See* Call; Etiquette.

CARDS, PLAYING. Bridge, whist, poker, cribbage and other popular indoor games are played with packs of cards. A full pack contains 52 cards, but some games, e.g. bezique, are played with a smaller number, certain cards being removed. There is an excise duty of 3d. a pack on playing cards in Great Britain. *See* Bezique; Bridge; Cribbage; Nap; Poker; Whist, etc.

CARD TABLE: How to Make. For card playing tables are made in all the woods used by cabinet makers, and are covered with green baize. One type consists of a square of wood supported on legs which can be folded up, enabling the table to be put away in the minimum of space.



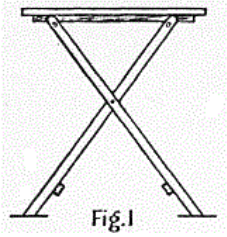
Card Table of oak, veneered with walnut, of an early 18th century English make. (Victoria and Albert Mueum, S. Kensington)

There exist some fine specimens of antique card tables, chiefly of walnut and other light woods. The one shown in our illustration dates from the early 18th century. The top is of oak veneered with walnut, the carved walnut legs being graceful specimens of the long cabriole with ball and claw feet. The top is covered with green cloth, the under surface of the hinged portion being treated with green morocco leather. When open it shows a top of four equal sides interspaced by four oval concaves for money and counters, and a plain circular panel at each corner to hold candlesticks. The underframing is hinged so as to permit two of the legs to support the leaf when open, just as in the ordinary flap-leaf table of to-day.

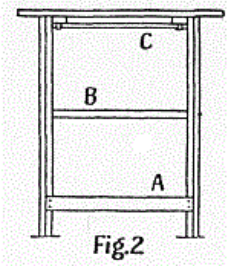
Figs. 1 and 9 show a simple folding card table. A suitable size is 2 ft. by 2 ft., the finishing height being anything between 2 ft. 3 in. and 2 ft. 6 in. For a longer and narrower top a size 2 ft. 6 in. by 1 ft. 8 in. is of service.

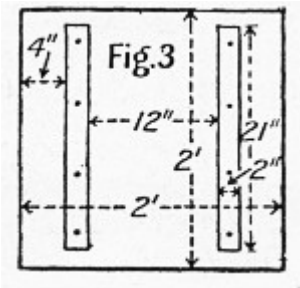
Mahogany is the best wood for the top. Pine or oak may be used. Elevations of the opened table are given at Figs. 1 and 2. The top may be put together with hardwood tongued joints and clamped at ends with 2 in. clamps, the only finish to the edges being to round them, the corners also being slightly rounded, say 1 in.

by 1 in. on the angle. In another way, a deal top can be grooved and tongued up, and have the edges finished with slips of 1 in. by 1 in. material mitred and screwed or nailed on all edges and finally rounded off.



Card Table. Figs. 1-9.



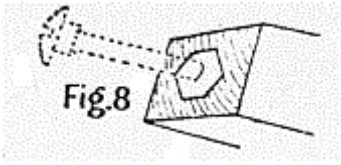


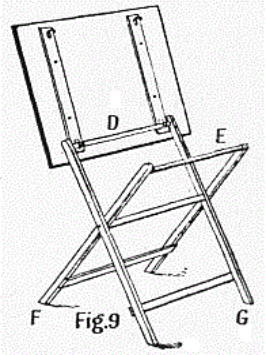












Diagrams show construction of a folding card table (By arrangement with Evans Bros., Ltd., London)

A better specimen of work would be to frame up the top, which could then be of material in lengths of 4 in. width, with the grain alternately reversed, and grooved into a framing 2 in. wide, the latter being mortised and tenoned together right through and wedged. The underside will be battened on with pieces 1 ft 9 in. by 2 in. by ¾ in. or ⅞ in. net screwed on. As shown on the plan, Fig 3, the position for these battens may be 4 in. from outer edges of top, which will make them 12 in. apart.

The trestles are made of material 1½ in. by 1 in., finished with the edges slightly rounded. These are pivoted together (Fig. 2, B) either with a length of 1 in. dowel (hardwood) or with tapped and nutted ⅜ in. iron rod. An alternative method of pivoting is to sink a nut into the end grain of a tightly butted length of 1 in. by 1 in. wood (say, beech, birch, or satin walnut, if oak is not available), and enter the bolts, through the trestle lengths, into the nuts after the manner indicated at Fig. 8. For these trestles four pieces, to finish 2 ft. 10 in. in length, will serve, the pivoting point being found 1 ft. 7½ in. from lower end or 1 ft. 2½ in. from top end, and not in the middle of each length.

Two stiffening rails (A) are screwed to the crossed pieces, say, 1½ in. by 1 in., or 1 in. by 1 in. will serve, fixed at about 3 in. to 4 in. up, and the same may be done to the part above the pivot. At the top end of each trestle pair a length of ¾ in hardwood dowel is fitted to holes tightly, and wedged or pinned. The centres for these holes will be -found by noting the position of the part at C, Fig. 2, the top end of trestle lengths being finished by rounding off the end grain.

In Fig. 9 a perspective view of the table opened out is given. From this it will be seen that the top is attached to the dowel rail at D by means of a pair of sockets, such as are used for a bolt to shoot into, two suitable kinds being indicated at Figs. 4 and 5, to be screwed to battens. These sockets serve as hinges to pivot the top and allow it to shut down on to the dowel rail at E, attachment being by means of a couple of hooked plates, as at Fig. 7, to be screwed on, or a couple of coat hooks, as at Fig. 6, will serve.

It would be possible to replace the dowel pieces D, E, with lengths of ½ in. brass tubes. If these are drilled each end for pinning, and with brass sockets and hooks, the effect would be smarter. In folding the table flat for standing against a wall the parts D and E approach F and G respectively, and the top lies upon them. *See* Bridge Party.

CARD TRICKS FOR HOME AMUSEMENT

Some Examples Needing only Sleight of Hand

This article contains information that will usefully supplement that given under the headings Children's Party; Evening Party. See also Conjuring

The tricks described here require no apparatus, no conjuring skill, and yet will provide plenty of amusement.

A slight manipulation with a pack, or with a number of packs preferably, will enable any one to puzzle an audience completely. Prepare a pack of cards by placing all the odd cards together, the 1, 3, 5, etc. of each suit, calling the jack and king as odd, and all the even cards together, and place the two halves of the pack on top of each other. It is perfectly safe to show the cards to the company, for it is most unlikely anyone will see how they have been divided. Now ask anyone to choose a card, and note which half of the pack it is chosen from, the odd or even half. Return the card yourself, making clear you are not looking at it, but return it to the half from which it was not originally chosen. Then deal all the cards, face upwards, in rapid succession, announcing that you will stop at the chosen card. Naturally, it is the only odd card in the even half, or vice versa.

Another trick is absurdly simple, but its very simplicity baffles nine people out of ten. Six cards are laid solemnly on the floor, and the performer announces that he will make any one of the cards selected by the company disappear. A card is chosen, the performer turns up his sleeves and slowly picks up the cards. He holds them for a few minutes in his hands, and then slowly puts them back on the floor, when the indicated card is found to have disappeared. The explanation is rarely guessed by any who do not know the trick. In picking up the selected card the

performer runs his thumb, which he has casually moistened with his tongue, down the side of it, and the next card adheres to it. The cards when picked up should be carefully alined up and given a firm squeeze before being laid down again, so that the two cards should stick firmly together.

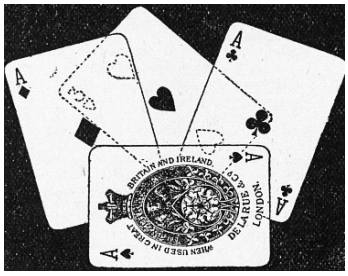
The four knaves trick is performed in this way. The performer runs through the pack and picks out the four knaves, keeping up a running story ot four knaves who are going to rob a house. The story is purely to distract the audience, and to hide the modus operandi of the trick. The four knaves are held out fan-wise in the left hand and the fact fully impressed on the audience that they are four knaves. The fan is closed and placed on top of the pack, face downwards. The performer then takes the top card of the pack, which is also the top card of the four, and places it, without showing it to the audience, about a quarter way down, telling a suitable story about this knave robbing the upper part of the house.

The next is similarly placed about half-way down, the third ¾ of the way down, and the last left on the top of the pack. The performer then gives the cards a sharp double knock, which, he informs his watchers, has so frightened the three knaves in the pack that they have all hurried to the top of the pack to join the knave there. As he does so he turns over the four top cards and shows the four knaves. The explanation is that behind the back card of the fan of jacks are three other cards. Properly squared up with the jack they do not show, and when the fan is closed and placed on the top of the pack, it is these three cards which are placed, one after another, in the pack, leaving the four jacks in position.

It is always a good plan to prepare for the next trick while the audience is thinking about the last. During such an interval make a quiet mental note of the two top cards of the pack, and then ask anyone to divide the pack into three heaps, and announce that you will name the top cards of all three heaps. The usual method of dividing a pack into three heaps is by putting off about one-third to form one heap and dividing the remainder into two equal heaps. So, the two top cards of one heap are known, and the top cards of the other two are not. Let the known heap be called A, and the other two heaps B and C, and suppose that
the two top cards in A are the ace of diamonds and four of clubs.

How the Trick is Performed

The performer calls out that the top card of heap C is the ace of diamonds, and picks it up. Without showing it to the audience he says "Correct," and states what the top card of B is. The card he names is the top card of C he already holds. He picks up the top card of B, calls out "Correct," as before, and names as the top card of A the card from B he has just picked up. As he picks the top card off A he holds all three cards, which have been correctly named, so that the audience can see them. The object of knowing the second card of the heap A is so that the trick may be repeated on demand to prove there is no trickery in it.



Card Trick. Lay-out of cards, showing how the Four Aces trick is performed.

The trick shown in the illustration almost explains itself, and its very simplicity usually prevents the secret from being discovered. The four aces are apparently placed on the table as shown, and the rest of the pack dropped on top of them, and shuffled all thoroughly together. One of the company should be then asked to find the four aces. The ace of hearts is missing, and is produced from any place where the performer has previously hidden it.

The cleverness of the following trick lies in the fact that though the victim apparently chooses a card at random from out of the pack, the card is in reality chosen by the performer. The trick consists in clever question and statement by the performer, enabling him to eliminate every card in the pack save the one chosen. The performer knows the position of one card in the pack. It is immaterial whether it is the top or bottom card, or the seventh card down from the top, say, so long as he knows its actual position. For the sake of explanation, one will suppose he knows the top card—the three of spades. By question and answer he forces his victim to name it.

A Series Of Questions. The questions are similar to the following "Which colour do you prefer in suits, red or black?" If the other says "Red," the performer says, "That leaves the two black suits, spades and clubs," and continues as below. If he answers "Black," the performer says: "Very well and which of the two black suits do you prefer, spades or clubs?" If the victim answers "Spades," the performer continues with his questioning. If he says "Clubs," the performer replies, "That leaves spades," and continues, " And now which cards of a suit do you prefer, those cards from the ten to the ace, or those from the nine to the two?" If the victim chooses the nine to the two, the performer continues as below. If he chooses the ten to the ace the performer replies, "That leaves the nine to the two of spades. Divide them into two parts, the nine to the four inclusive, and the three and the two. Which will you have?" If the victim, as he most likely will, says the nine to the four, the performer replies, "That leaves
only two cards, the three and the two of spades. Which will you have?" If the victim says the three of spades, the performer quietly asks him to turn up the top card of the pack. If he chooses the two, he says, "And that leaves the three, does it not?" The victim agrees, and the performer turns up the top card—the three of spades.

The end of the trick should never be explained, as it

always causes intense astonishment, to those who do not know it, how the chosen card should be on the top of the pack (or, of course, any other position known in advance to the performer). He is firmly convinced that he himself has chosen this one card out of the 52 in the pack. The whole essentials of the trick consist in taking or leaving each suit and each set of cards in turn or not, as necessary, according to the colour, denomination, and size of the known card.

CARIES: In the Teeth. Dental caries is a slow progressive destruction or rotting of the hard substance of the tooth, caused primarily by acid acting on the outer part of the tooth.

The foods which become decomposed in such a way as to form acid are sugars and cooked starches. These, known collectively as carbohydrates, encourage the multiplication of acid-forming parasites or bacteria, more especially in the crevices of, or between, the teeth or wherever the action of the tongue, lips and saliva does not easily remove them. The enamel beneath the carbohydrate and bacteria is softened or dissolved by the acid formed, and broken down. The destruction of the tooth generally proceeds more rapidly when the enamel is broken through.

For the prevention of caries it is particularly desirable that the food at the end of a meal should be of a cleansing nature, so that the mouth will be left free from the carbohydrates previously eaten. This means that artificially prepared carbohydrates, e.g. sweets, bread and jam, or sweet biscuits, should never be allowed to terminate a meal, but should be followed by some natural food such as uncooked fruit, or vegetables like celery. If these foods are undesirable, as, for example, with very young children, withhold highly sweetened foods altogether, and substitute hard, unsweetened foods, such as toasted bread or crusty bread and butter. *See* Teeth.

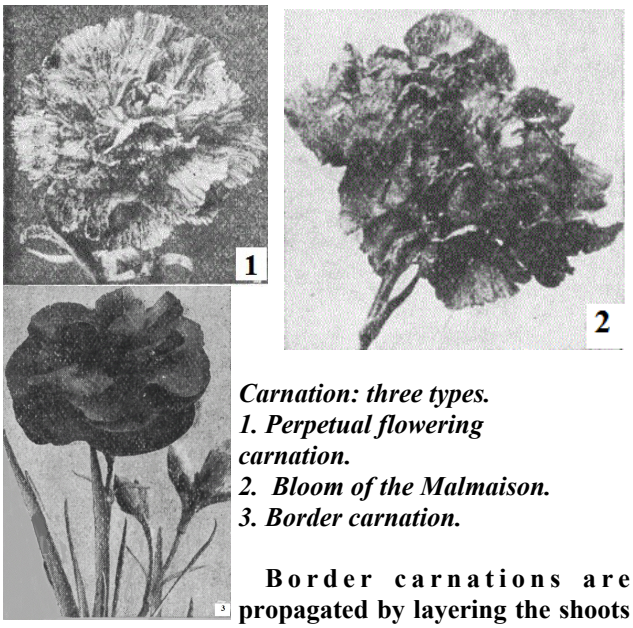
CARMINATIVE. Peppermint, cloves, allspice, cinnamon, cascarilla, bitter orange, alcohol, etc., used to relieve flatulency and intestinal colic, are examples of the remedies termed carminatives. By stimulating the stomach and the intestines into more forceful movements they help to expel the gas which has accumulated in the digestive tract.

For babies dill water may be used in teaspoonful doses, and a little bicarbonate of soda may be added with advantage. For others, peppermint water, which is more pungent, is useful, the dose being one to four tablespoonfuls, and here also bicarbonate of soda, perhaps half a teaspoonful, should be added; or soda mint tablets might be taken, *See* Cascara; Indigestion.

CARMINE. Being a particularly fine red colouring, carmine is much used for cooking and confectionery purposes. It is practically the same as cochineal, and both are valuable, not only on account of their colour, but because they are absolutely harmless and devoid of flavour. A small bottle of carmine will last an ordinary household a long time, as a few drops give a good deep pink. Two or three drops at most are ample for a pint of cornflour blancmange. *See* Cochineal.

CARNATION. There are four chief types of carnation—the border carnation, which is grown in flower beds out of doors and blooms in summer; the perpetual-flowering carnation, which is cultivated in pots under glass and blooms all the year round, though chiefly in autumn, winter and spring; the annual carnation which flowers in summer from seeds sown in spring; and the Malmaison.

The border carnation is a fine old English flower of which many charming new varieties have been raised in recent years. It flourishes best in well-drained soil; on heavy land it is a good plan to raise the carnation bed 6 or 8 in. above the ground level, so that the plants are not waterlogged in winter. Well-dug soil with which a little decayed manure and mortar rubble have been mixed suits them. In most gardens planting is best done in September or October, in very cold districts the plants are wintered in a frame and planted in March.



Carnation: three types.
1. Perpetual flowering carnation.
2. Bloom of the Malmaison.
3. Border carnation.

Border carnations are propagated by layering the shoots in July. The layers will be well rooted by the middle or end of September, and may then be taken up and replanted at 15 in. apart to form a new bed of carnations; they will bloom the following year. Large plants can be obtained by leaving the layers undisturbed. It is not necessary to layer border carnations every year; they may be left untouched for at least two or three years. Such plants will bear large quantities of flowers.

Another way of raising a stock of border carnations is to sow seeds in a box of soil in a frame or greenhouse in March. When the seedlings are well developed they are planted out of doors, preferably where they are to bloom, at 18 in. apart. It is necessary to sow seeds of a really good strain to obtain a large percentage of double blooms. Carnations grown in this way yield more flowers than those raised fresh from layers each year. Border carnations can also be increased by

cuttings, though these are less certain than layers. Some of the best varieties of border carnations are: Crystal Clove, white; Royal Clove, pink; Bookham Clove, crimson; Margaret Keep, blush pink; and Steerforth, white marked with crimson. All the above varieties are fragrant.

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Other border carnations of brilliant colouring are Mary Murray, yellow; Dr. Raymond Crawfurd, orange buff; Miss Josephs, old rose; Yvonne Thomas, lavender; Fair Ellen, white marked with lavender; Jessie Murray, white marked with mauve; Mrs. E. Charrington, white marked with lilac; Grenadier, scarlet; J. J. Keen, apricot and rose; Linkman, yellow and scarlet; Pasquin, yellow, pink and lavender.

Perpetual-flowering carnations are grown in immense quantities under glass to supply the florists' shops with blooms. These are long-stemmed, of many charming colours, and of great decorative value. Their cultivation is now quite an important industry. A sunny, well-ventilated greenhouse in which a minimum winter temperature of 45 to 50 degrees can be maintained is required for their cultivation. They need rather dry, airy conditions, therefore a span-roofed glasshouse in the open is better than a lean-to against a wall. The method of cultivation is to take cuttings in January, to repot the young plants as is necessary and finally to put them in 6-in. flower pots. The most suitable soil compost consists of loam (pieces of old turf), with which a scattering of sand and crushed mortar rubble and a little thoroughly decayed manure have been mixed. For the final potting bonemeal (one 6-in. flower pot of bonemeal to a wheelbarrowful of soil) or one of the special carnation fertilisers should be added. The greenhouse must be ventilated freely whenever the weather conditions allow; the carnations do not flourish in a close, moist atmosphere.

The cuttings form roots most certainly when inserted in a bed of sand in a propagating case placed over the hot-water pipes. The shoots near the middle of the stems of the old plants make the best cuttings. Perpetual carnations must be "stopped" twice, the last stopping not later than the end of June. Stopping, or removing the ends of the shoots, makes the plants, branch out.

Seeds sown in a heated greenhouse in spring will produce plants that will bloom the following winter. If the best seed is sown there will be a fair percentage of double flowers, but it is wiser to rely on cuttings taken from named varieties.

Beautiful varieties of perpetual-flowering carnations are: Purity, white; Laddie, salmon; Eileen Low, salmon pink; Red Laddie, red; Topsy, crimson; Wivelsfield Apricot, pink and yellow; Robert Allwood, scarlet; Achievement, apricot; Duchess of Gloucester, pink.

Malmaison carnations are little grown nowadays. They need similar conditions to the perpetual-flowering carnations. They are grown in flower pots 8 in. in diameter, and are increased by layering in summer.

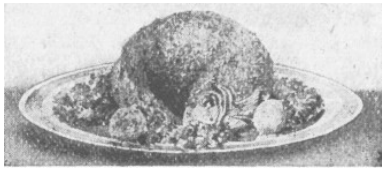
Annual Carnations. Carnations which bloom the same year in which seeds are sown are useful as pot plants in the greenhouse and for filling summer flower beds. The best strain of seed yields a good percentage of double flowers of various colours. The seeds are sown in February-March under glass. When the seedlings are large enough they should be potted singly in 5-in. pots if wanted for the greenhouse, or they may be planted out of doors in May.

The chief pest of the border carnation is a grub which bores into the stem and causes its collapse. It is sometimes possible to kill the grub by using a hairpin, but, as a rule, a plant damaged in this way should be pulled up and burnt. Spraying with paraffin emulsion early in summer is recommended to keep away the flies. Birds often peck off the tops of the leaves in spring, though usually the plants grow freely afterwards. Black cotton tied to pegs among the plants will keep off the birds. Rust and leaf spot may do much harm to perpetual-flowering carnations under glass. Use sulphide of potassium, dissolved at the rate of 1 oz. to 10 gallons of water. It is better to use this as a preventive than as a remedy. It is important that all unhealthy foliage should be cut away.

CARP. Like all fresh-water fish, carp requires to be cleaned as soon as possible after it is taken out of the water, or it acquires a rank, muddy flavour. Carp is perhaps nicest if stuffed and baked, or it can be filleted and fried or plainly grilled.

To stuff and bake a carp, mix together 3 tablespoonfuls fresh white breadcrumbs, 1 tablespoonful chopped suet, 2 teaspoonfuls finely chopped parsley, and 1 teaspoonful powdered herbs. A little minced shallot may also be added. Add a seasoning of salt and pepper, and bind all with a beaten

egg. Press this stuffing into the cavity made by cleaning the fish, and sew the edges together with coarse thread. Brush the fish over with beaten egg, and dredge it well with crumbs.



Carp. Stuffed carp ready for serving. It may be garnished as shown, or a fish sauce poured round.

Grease a fireproof baking-dish, and curl the fish in it so that the tail can be fastened in the mouth with a skewer made from a pointed match. Put about 1½ oz. of butter or dripping in with the fish for basting purposes. It will take about an hour to cook. Serve it in the dish in which it was cooked, removing the string and skewer A fish sauce can be poured round it, or merely the fish juice and butter in the dish can be used to moisten it.

Fried carp is also good. After cleaning it, with a sharp knife remove the flesh from the bones, and cut each fillet into convenient-sized pieces. To improve the flavour, lay the fillets to soak for an hour in a mixture made of 2 tablespoonfuls olive oil, 1 tablespoonful vinegar or lemon juice, 1 teaspoonful each chopped parsley and onion or shallot, and salt and pepper.

Turn the pieces now and then. Then drain them from the marinade, dredge well with flour, and fry them in hot dripping until well browned. Serve the fillets with a garnish of cut lemon, anchovy sauce, and any roe taken from them, which must be egged, crumbed, and fried separately.

Carpentry. This term refers to the constructional forms of woodworking, e.g. roofing, flooring, etc. *See* Amateur Carpentry.

CARPETS AND CARPET REPAIRING

Selecting and Laying them to the Best Advantage

See the articles on Bedroom; Dining Room and other rooms of the house; also Colour Scheme; Linoleum, etc., and the colour plate herewith

The first thing for the buyer to decide is the approximate amount he is prepared to spend on a carpet. This being settled, the choice of qualities is automatically narrowed down.

If a thick carpet is required, the purchaser will probably first turn to hand-knotted carpets, which may be either British, European, or Oriental. The cheapest hand-made carpets are Indian. Beautiful designs are seen in Oriental productions of good quality, especially in Chinese. Modern hand-made French carpets are flat, being woven after the style of the old Aubusson. If any doubt is entertained as to the knot, the intending purchaser should bend open the pile, across the width, when the tuft of yarn will be seen, firmly knotted, or, more strictly speaking, looped round the warp threads. Even this, however, is no guarantee that the carpet is hand-knotted, for there are power-looms capable of imitating very closely the Oriental knot. This is not saying that such carpets are necessarily inferior to hand-knotted carpets of corresponding quality; indeed, they may be as good or better; only the buyer should not be put off with a machine-made carpet if he is seeking a hand-made one. The machine-made will be appreciably cheaper.

The carpet should also be examined to ascertain its pitch, that is, the number of tufts in any unit of length and width of the fabric. Hand-tufted carpets vary generally from 9 to 100 tufts to the square inch, though there are qualities even finer than the latter. Broadly speaking, the coarser the pitch, the heavier will be the fabric; also, the coarser will the design appear. The finer carpets, though lighter, will be more expensive, owing to the slower production and higher cost of weaving.

Axminster and Wilton Pile. Apart from hand-tufted carpets, depth of pile and luxurious tread can be obtained in many qualities of machine-made Axminster and Wilton. Axminster, with its comparatively thick woollen yarn, lends itself in particular to the production of soft and heavy qualities. The depth of the pile can be gauged not only by pressure of hand or foot, but also by opening up the pile between the rows across the width of the fabric, and noting the height which the tuft stands up from the back. Heavy qualities are also made in Wilton.

Below these in value comes a variety of qualities in Axminster, Wilton and chenille, which form the bulk of the average carpet dealer's stock, the retail prices of which will be within the means of the average householder. These comprise the standard qualities in the three fabrics mentioned, all of which have either a tufted or cut pile surface, and give a comfortable, if not luxurious effect.

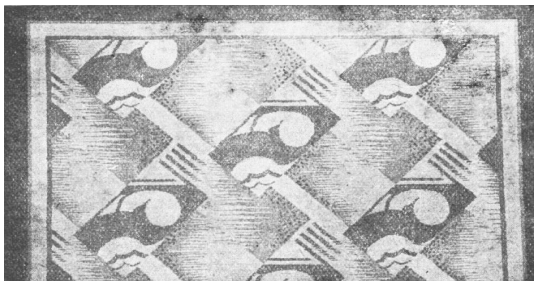
In Axminster the pattern is formed by tufts of woollen yarn that are cut off and inserted double in the body of the carpet. It is practically unlimited in colour effect, and is made in all widths from 12 or even 15 ft. downwards, that is, both in seamless carpets, in body, border, and stair, and in sewn carpets made up in 27 in. breadths. The most typical and popular Axminster quality is about ⅝ in. thick., with about 45 tufts to the square inch.

Wilton is made of worsted yarns, the velvety surface being obtained by the cutting of the warp threads that form the pattern after they have been looped over the wires in the loom. This type of carpet is limited in colour, but is susceptible of finer effects of design than Axminster, owing to the greater closeness of pitch. A typical quality of this fabric is about ⅜ in. thick, utilising five or six colours, and with about 90 tufts to the square inch. It is made in widths up to 54 in., and also in seamless carpets.

In chenille Axminster the pile consists of chenille fur, which is inserted as one of the wefts and woven on to the body of the carpet. The design is apt to show a certain irregularity (not necessarily unpleasing), and the pitch is coarser than in tufted Axminster or Wilton.

Chenille carpets are generally seamless, and a standard quality is about five rows of fur to the inch. They are to be obtained in excellent colourings.

Loop-pile Carpets. Below these medium qualities there are cheaper grades of Axminster, Wilton, and chenille, and there are also the Brussels, tapestry, and ingrain fabrics. Brussels is a loop-pile fabric, made in much the same way as Wilton, but with the loops left uncut. The clean but rather hard surface makes it a suitable floor-covering for some purposes; but, although the loops have a certain resilience, the fabric has not the same richness as Axminster and Wilton. Hair carpets are the best known loop-pile fabrics and are excellent in natural colour for stairs and as a background for Oriental rugs. These carpets are also a good choice for bedrooms and are obtainable in many shades by the yard and seamless.



Carpet. Example of modern seamless Axminster, made in sizes 2-3 yds wide by any length in ½ yd. multiples. The design combines both "floral" and "geometrical" modern tendencies. (Courtesy of Waring & Gillow, Ltd.)

Ingrain Carpets. Scotch, or art squares, are of a different class of manufacture, the design being obtained by combinations of the warp and weft threads. The surface of the fabric is flat, and even in the heavier qualities it cannot be regarded as a luxurious carpet.

What has been said so far applies to carpets with a surface composed of worsted or woollen yarns, combined with a backing of woollen, cotton, linen, or jute warp and weft. Carpets, however, are also made solely of jute. The lower cost of this material enables a carpet to be produced at a cheap price, but dyes are less satisfactory and the fabric lacks resilience. Coir, or coco-fibre, carpets are obtainable in attractive designs and colourings for bungalows or use on stone floors.

Decorative Considerations. Colour is often the first consideration with the purchaser of a carpet, and rightly so, as tiles, walls, curtains, etc., may have to be matched or pleasantly contrasted in the scheme of a room.

In the first place, the carpet should be regarded as the base of a decorative scheme, and in most cases should be darker in tone than any other part of the room, because it presents the largest mass of colour and because it forms a background to the furniture. This is not to be interpreted as ruling out all light-ground carpets; but such can only be employed with discretion, and in association with appropriate wall treatments and furniture. A well-lit room can stand a darker and richer carpet than one with small or few windows, where a carpet with fairly light ground colour may be laid with the object of aiding the lighting of the room by reflection.

In most effective schemes three or four harmoniously contrasting colours are employed A room decorated strictly on the self-colour or tone on tone principle, as, for instance, with a carpet in three or four shades of blue, blue walls, blue woodwork, and blue curtains, might be harmonious in a sense, but not pleasing. The proper use of semi-complementary colours is one of the secrets of an effective colour scheme.

The choice between a plain or self-patterned and a multi-coloured carpet is largely a matter of taste. In the case of the former the selection of a colour scheme is to some extent simplified. It is certain that it is not desirable to have too much pattern in a room; that, for instance, a figured carpet, figured curtains and figured wallpaper would be most difficult to harmonise, and unrestful. Broadly speaking, the prevailing colour of the walls and curtains should contrast harmoniously with the prevailing colour of the carpet, while there should be notes of some of the colours of the carpet in other details of the room.

The question of design may be of minor importance compared with the consideration of colour; but the right selection of a pattern is of high value in successful furnishing, as the adoption of a scheme in a room in which consistency and harmony are carried out in colour and also in design leads to perfection in interior decoration.

A definite and pronounced style, if adopted for the carpet, should be carried through the rest of the decoration. For instance, if geometrical patterns are liked, these go best with quite modern furniture, wall and window schemes. Carpets are obtainable representing every known period; and if a householder wishes to furnish his room completely in the Adam, Louis XVI, or in any Oriental style, he can do so by taking a little trouble.

Choice, however, is not limited to definite periods or to very striking designs. Many carpets of unobtrusive and harmoniously blended patterns and colourings tone perfectly with curtains and furniture of different styles, provided that the colour scheme is right. It may be sound advice to a householder who has to choose a carpet for a room with decorations of a nondescript or even a mixed character to select a plain carpet or one in a good Oriental style. Picture carpets are made in Axminster, or more expensive ones are hand-made, as seen in the illustration herewith.

Care of Carpets. One of the problems which may occur is whether to fit the carpet to the room, or to have a bordered square with a margin of floor between the edge of the carpet and the skirting. The former choice may be more cosy, and looks well with a plain

pile or hair carpet, but the latter is cleaner and more economical, enabling the room to be swept more easily, and the square can be changed end for end to equalise the wear. Oval and round carpets suit many rooms.

Carpets should be be cleaned with a vacuum cleaner or brushed regularly with a carpet sweeper, or a broom that is not too hard.

The Laying of Carpets. The floor should be perfectly clean before the carpet is laid. After removing any old nails from the boards they should be scrubbed with soft soap and warm water, and allowed to dry thoroughly before the carpet is laid. This is an important point, and it is advisable when possible to do the scrubbing a few days beforehand, and to have a fire lighted in the room for a few hours to ensure thorough airing. If the carpet is laid over damp boards it is liable to rot.

The character of the surround must be decided upon, and it must be dealt with before laying the main carpet. If the surround is to consist of the plain boards, stained and polished, this must be done several days beforehand to ensure thorough drying of the stain. The width of the surround should allow for it to extend for 2 in. beneath the main carpet, and before applying the stain the exact width to be stained should be marked on the floor with chalk.

When the surround is made of linoleum it is a good plan to use an underlay of tarred paper. This prevents damp from rising through the linoleum, and it also prevents moisture from injuring the flooring.

The first precaution in laying the carpet is to put a suitable underlay in position. This keeps the carpet from direct contact with the floor, makes it wear very much longer, and also gives an impression of softness and comfort that is absent when the carpet is placed directly over the boards. The underlay can vary considerably in character, and is, as a rule, not fixed firmly to the floor, or only held in position by means of a few small tin-tacks. The best underlay is a plain and inexpensive grey felt.

Once the underlay is securely arranged the main carpet must be rolled and placed in position. A chalk mark should be made to indicate to where it must extend. In the case of a valuable or very thick pile carpet it is desirable to call in an expert, who has the tools necessary for stretching the carpet properly. Failing this, care must be exercised by the amateur to stretch the carpet well. Only a small portion should be unrolled at a time, and the roll used to pull and stretch the carpet after the free edges of one side have been fixed. The best kind of carpet nail is a patent brass nail which passes through the carpet and into a brass groove, securely holding the carpet in position. It is quite easily drawn up without tearing the carpet when the latter is removed for shaking.

Fitted Carpets. In the case of a fitted carpet completely covering the floor, the dimensions of the room must be carefully noted. If possible, an expert should be sent for to make exact measurements; but if this is impracticable for any reason, then a rough plan should be made of the room. The outside measurements, by the floor along the skirting-boards, should be taken, also the measurements of fireplace, any recesses, etc. These dimensions, together with the measurement of the room diagonally from corner to corner, would enable a carpet manufacturer to make up a carpet in the exact size required. If an expert is not available to fix the carpet, care must be taken after fixing the underlay to stretch the carpet to its utmost and to fasten it down securely. To ensure this a wide brush such as painters use can be shorn of its bristles, and then used by pushing it along the surface of the carpet to press and stretch the carpet properly, so that it lies perfectly flat upon the floor.

Carpet nails as described above should be used at each corner and across the doorway. In other parts of the room the carpet will be held in position sufficiently by the weight of the various pieces of furniture.

Stair carpets need care in laying over under-felt or stair pads. Sufficient stair carpet should be bought to allow of at least an extra ½ yd. for each flight of stairs. This extra length makes it possible to rearrange the carpet about four times a year, so that the wear is distributed evenly over the whole length; without it, the carpet will quickly show signs of wear at the edge where the tread falls on each step.

The extra length of carpet can be folded up smoothly under the last step or under the tread of the carpet of the top landing at the head of the flight of stairs. In laying a stair carpet it is advisable to start at the top, securely nailing down the top edges. The carpet is then gradually unrolled, drawn down and fixed in position by means of the stair rods. Each step is gradually covered in this way and the carpet drawn taut, so that it lies perfectly even and straight over each tread of the staircase.

Repairing Carpets. When a carpet is in need of repair this work may be entrusted to the firm from which it was purchased; but if amateur workers should desire to attempt repairs themselves, the following hints may be useful. A supply of the raw material is necessary; cotton, linen, jute, and worsted or woollen yarns, the latter in the same shades and of approximately the same thickness as those used in the manufacture of the carpet, should be obtained, and stout needles of a suitable size.

If the back of the fabric has been destroyed, it will be necessary in the first instance to sew in carefully threads representing warp and weft. This done, the pile surface may be sewn on, in different styles, according to the nature of the fabric. Occasional stitches present no difficulty, but if a patch of even 3 or 4 sq. in. in a patterned pile carpet has been burnt, considerable care and skill will be required to restore the correct design and colour.

In the case of a Brussels or tapestry carpet the missing threads are replaced by others sewn round wires, which represent the original wires in the loom.

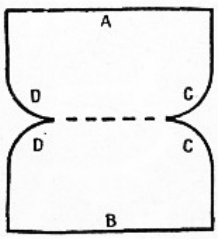
With Wilton or Axminster the tufts are sewn into the back, and cut off with scissors on a level with the existing pile surface. Tapestry velvet can be treated similarly.

Chenille Axminster occasionally suffers from breakage of the fine cotton threads which hold down the fur of the pile. If the fur is not lost or destroyed, it can easily be sewn down again; but if it is lost, it is hardly possible to obtain any of the correct pattern of the fur, and the next best thing is to sew in tufts as in Wilton or Axminster.

Repairs to a machine-knotted carpet, or to one which shows the pattern on the back, to be done correctly involves sewing the tuft yarn right through the body of the fabric. Repairs to the coarser types of hand-tufted carpets may also be made in this way, but repairs to a fine Persian carpet should not be attempted by the amateur. For cleaning carpets special soaps are used. *See* Soap. (*See also page 360*)

CARPET BAG. A carpet bag takes its name from the material of which it is made and is used for the transport of workmen's tools, cricket and sporting requisites, and other purposes. A simple form of carpet bag is made by cutting a piece of old carpet to the shape shown in the diagram; it is folded along the dotted line and sewn together at C D, using a cross-stitch.

The top is bound with a strong webbing band, bringing the end joint of webbing away from the sewn-up sides of the bag. The joins C D can then be covered with leather or webbing stitched in place. A canvas lining should be cut to a similar pattern and sewn to the top of the carpet prior to attaching the binding. Handles can be affixed where desired.



Carpet Bag. Diagram showing pattern.

Cricket and other carpet bags can be recovered by unpicking all the stitches, flattening out the old material and cutting a new piece of carpet to correspond. This is then sewn up in the same way as the old carpet and attached to the framework. In many cases cricket bags have a stiffener of card or leather; the purpose of this addition being to keep the bottom in shape.

CARPET BEDDING. Plants which are dwarf in habit, or are kept dwarf by clipping, are arranged in formal beds so that the diversity of colour of flower or foliage gives the bed a carpet-like appearance. The art of so arranging them is called carpet bedding. This operation is usually carried out by the aid of a wooden bench or form upon which the gardener can kneel or sit.

Clever gardeners can work out most intricate designs in the varying colours of bedding plants. The plants need continually clipping and cutting back, or the bed becomes ragged and loses its trim, neat aspect. The chief kinds used are alternanthera, echeveria, mesembryanthemum cordifolium variegatum, herniaria, sempervivum golden leather, and sagina.

The diagrams on page 359 are typical examples of carpet bedding, and although the make-up of the beds is largely a matter of individual taste, the suggestions given may be accepted as giving a pleasing diversity of pattern and colour. Fig. 1 shows an ivy leaf; A, silver foliage with dot plants of dark-leaved nasturtium; B and C, vermilion and gold, rose and carmine, or mauve and purple. Fig. 2 shows a cornflower; A, maroon; B, gold or silver foliage with petals in two shades of blue. Fig. 3 shows tobacco blossom; A, gold; B, white; C, lemon; D, faint lilac; E, mauve; F, deeper mauve; G, dark purple; H, pink or silver. Fig. 4 shows A, deep red lobelia; B, white lobelia; C, golden feather; D, Iresine; E, Silene pendula compacta rosea; F, miniature sweet alyssum; G, gold violas.

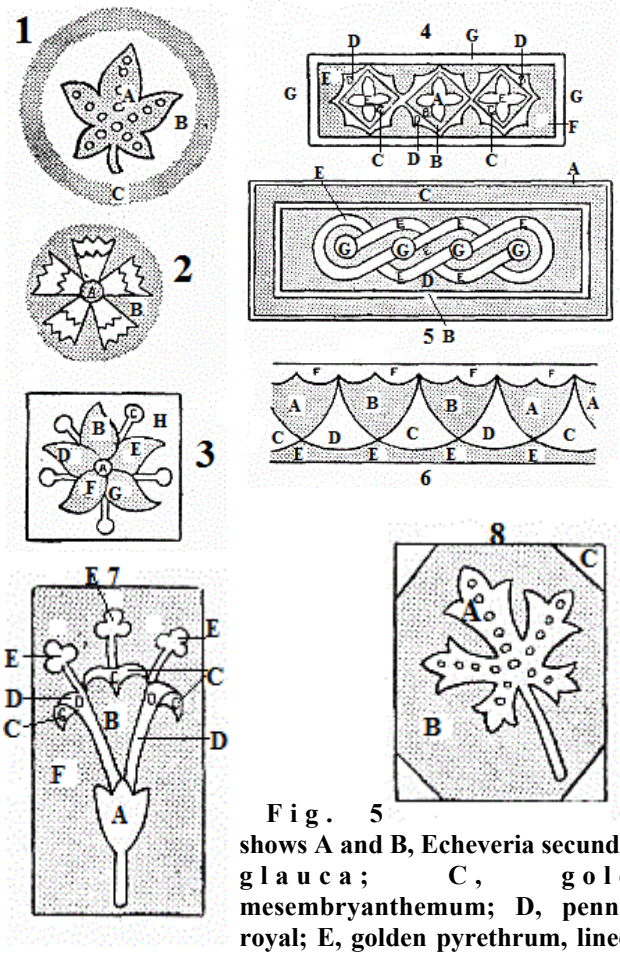
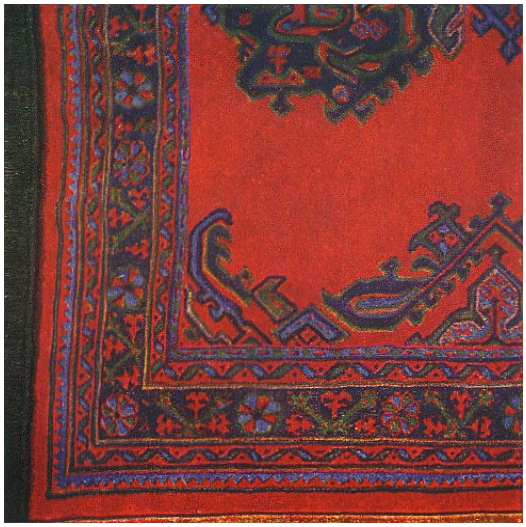


Fig. 5 shows A and B, Echeveria secunda glauca; C, gold mesembryanthemum; D, penny royal; E, golden pyrethrum, lined with Alternathera paronychoides; G, Iresine Lindenii. Fig. 6 shows A, scarlet nasturtium; B, golden nasturtium; C, sweet alyssum; D, blue violas; E, Echeveria secunda glauca; F, dwarf beet or Iresine. Fig. 7 shows a lily; A, silver green foliage; B, white; C, deep rose; D, blush; E, yellow; F, royal blue. Fig. 8 shows a maple leaf: A, dull gold with dot plants of scarlet crimson; B, Californian bluebell or pale blue violas; C, gold, scarlet-crimson, or deep blue. *See* Bedding.

(*Continued in page 361*)



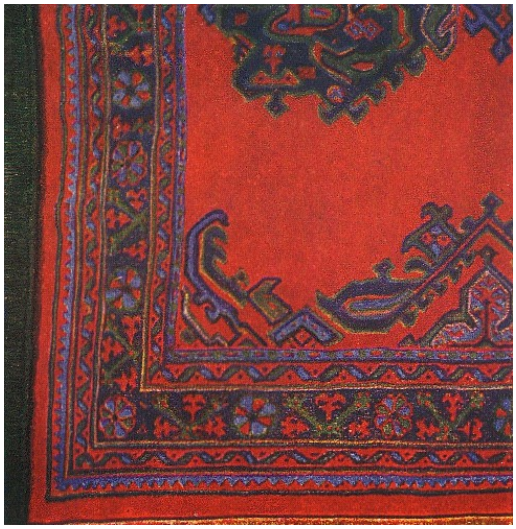
Wilton Persian design, with thick pile



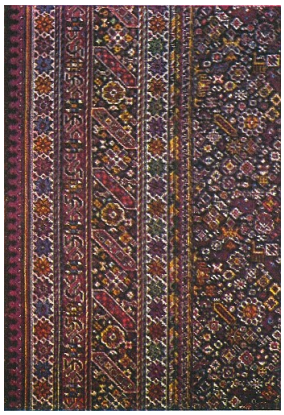
Antique Persian, of moderate cost



Seamless Axminster; with wearing face of wool



Turkey hand made and vegetable dyed



Brussels, standard pattern



Indian Mirzapore, made by hand

CARPET: STANDARD BRITISH AND ORIENTAL FLOOR COVERINGS IN GENERAL HOUSEHOLD USE

Direct reproductions from carpets lent by Messrs. Treloar and Sons.

CARPET SWEEPER. A carpet-sweeper consists of a circular brush enclosed in a wooden box on wheels and fitted with a long handle. The dust is collected in the box, which should have rubber corners to prevent damage to furniture.

A carpet sweeper will last for years, and do its work easily and effectually, if it is kept in proper order. Each day, after use, the dust and fluff accumulated in the box must be removed, and the brush itself kept free from hair, cotton, etc. In most kinds an automatic comb is fitted for accomplishing this. In time bits of hair, thread etc., will get wound round the axle of the sweeper between the wheels. When this is the case the framework should be drawn away from the axle, and the brush taken out so that the axle may be cleaned. *See* Vacuum Cleaner.

CARRIAGE. In general this word is used for any vehicle used for carrying, but more especially it means a vehicle drawn by a horse or horses and owned by a private individual. Carriages are called by different names, according to their shape, size, and other conditions.

Carriage Licence. In Great Britain a tax is charged upon carriages kept by private persons. For four-wheeled vehicles drawn by one horse this is 21s. a year, but if drawn by two horses it is 42s. Two-wheeled vehicles pay 15s. a year. Vehicles used for business purposes are charged nothing, but a tax of 15s. a year is paid by the owners of cabs plying for hire. Carriage licences can be obtained from any post office.

CARRIER: Of Disease. In medicine this is the name applied to persons who are found to be carrying in their bodies virulent micro-organisms which are capable of producing disease in other people if communicated to them. Thus diphtheria and cerebro-spinal fever carriers have the microbes of these diseases in their throats, and these people may not themselves have suffered from the disease which they carry, or only so mildly that it has been overlooked. Enteric fever carriers are persons who have recovered from the disease but who continue to pass the germs in their stools.

When a case of diphtheria (q.v.) arises all residents in the house should be examined to ascertain whether or not they are carriers.

CARRIER: The Legal Aspect. There are two kinds of carrier, the common carrier and the special carrier. A common carrier holds himself out to carry goods from one fixed place to other fixed places on payment of his customary charges. A special carrier undertakes special journeys on terms arranged for each journey. A railway company is a common carrier, a furniture remover a special carrier.

A common carrier is bound to accept for carriage and to carry all goods of the kind he professes to carry so long as he has room for them and the consignor will pay the usual charges. Apart from any special term, he is liable for their safety and safe delivery, quite apart from his negligence, except for acts of God and the King's enemies. Thus, if they should be stolen by armed thieves, or damaged by someone else's negligence, he is liable.

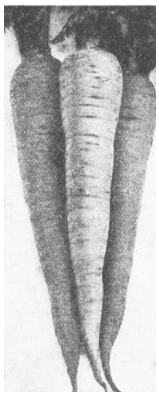
Railway companies are only liable for goods sent at owner's risk if the goods are lost or damaged by the misconduct of their servants. *See* Parcel Post.

CARRIER PIGEON. Noted for its stately grace and dignified bearing, the carrier pigeon is held in high esteem by fanciers. No pigeon commands higher prices, as much as £200 having been paid for a show specimen. Possibly, on account of its name, many wrongly attribute to the carrier the characteristics of the homer; but although at one period it possibly possessed them, they are non-existent in the English carrier of to-day. *See* Pigeon.

CARRIER WAVE. A continuous wave of constant frequency which is radiated all the time broadcasting is being transmitted. The carrier wave is modulated or varied by sound vibrations picked up by the microphone in the broadcasting studio. *See* Microphone.

CARRON OIL. A soothing application for bums and scalds, first used at the Carron ironworks, Stirlingshire, received the name of Carron oil. It is prepared by shaking together equal parts of lime-water and linseed oil, when a thick cream is obtained. This is freely applied to lint or soft rags, and placed upon the burn or scald. Carron oil is improved by the addition of 1 or 2 per cent. of an antiseptic, such as carbolic acid or eucalyptus oil.

CARROT. This valuable root vegetable thrives best in deep, well-drained soil; but heavy land can be made suitable by cultivation and by adding sand, sweepings from garden paths, grit, and leaf-mould. Lumpy soil will produce ill-shaped roots. As the seeds are small, the ground surface must be well broken down with fork and rake before they are sown.





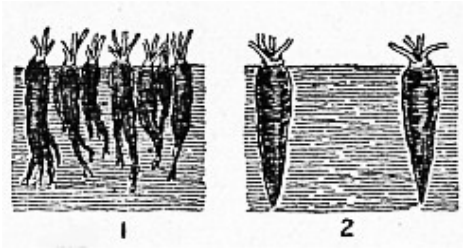
Carrot. Right, early Gem carrots, a prolific and profitable variety. Left, bunch of Long Reds.

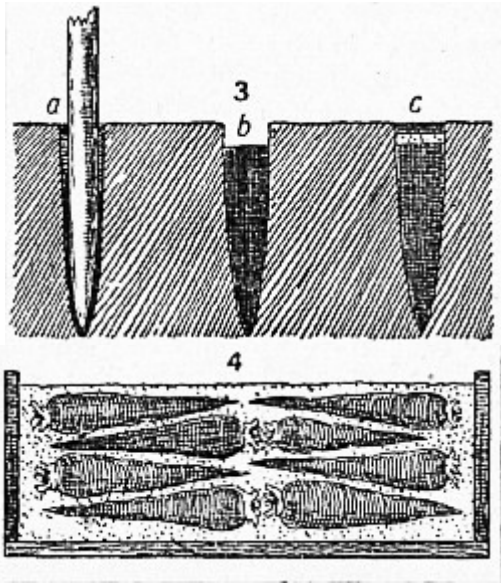
The main crop of winter roots is obtained by sowing seeds thinly in shallow drills 10 in. apart in April. The seeds are covered sufficiently by passing the rake over the drills. The seedlings must be thinned out gradually until they are 6 in. apart: the final thinnings will be large enough to use in the

kitchen. During the summer months the soil between the rows must be hoed frequently to keep down weeds. In October or early November the roots are lifted and stored in sand or soil at the foot of a wall or fence. Often they are placed in boxes in a shed, but in such conditions their flavour deteriorates.

A sowing of an early variety in July will yield small roots of excellent flavour in autumn and early winter. To provide young carrots in summer, seeds should be sown on a warm sheltered border in March. By sowing on soil placed on a hotbed in a frame in November, and during the winter, a succession of small early roots is obtained.

On deep, well-tilled soil the long-rooted varieties, e.g. New Intermediate and Long Surrey, may be sown. For ordinary garden soil James's Intermediate and Scarlet Intermediate are more suitable. Of the small-rooted sorts for sowing in March and again in July, French Short Horn, Early Gem, and Scarlet Horn should be chosen. Varieties to sow in a frame in winter are Parisian Forcing, Early Nantes, and Inimitable Forcing.





Carrot. 1. Insufficiently thinned and 2, amply thinned plants. 3. How to sow carrots: a, hole levered with dibber; b, hole filled with fine soil; c, seed sown on top and covered with fine soil. 4. Carrots stored away from frost in fine soil or sand.

How to Cook. The carrot contains no starch, but a large amount of saccharine matter, and is of great value as a flavouring vegetable. Young carrots are most wholesome, and the fine colour of the outer portion lends a decorative touch to stews.

Carrots should never be peeled. After they are washed take a sharp knife and lightly scrape oft the outer coating, scraping from crown to root. It is best not to do this until the last moment, or the flavour is weakened. Young carrots require about ½ an hour's cooking, and old ones about 1 hour's.

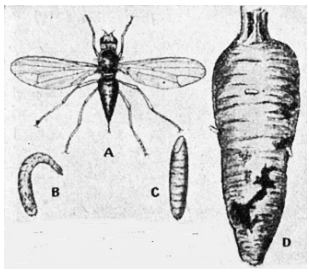
If to be stored during the winter, put them, if possible, on a slate slab, covering them with sand. Carrots when used for garnishing purposes are cleaned and cut into various designs, after which they are boiled in slightly salted water. Grated carrots are often used in Christmas puddings and added raw to salads.

To boil carrots, cut off the green tops and rootlets of 2 lb. of carrots; scrub, then scrape the carrots downwards until they are quite clean, taking care to cut out all specks. Lay them in cold water, cutting them, if large, lengthways into quarters. Place them in boiling salted water, and boil them until tender. Pierce them with a skewer to make sure they are soft. Drain off all water, and serve them either plain with butter and pepper, or with melted butter sauce, or chop finely, reheat in the saucepan, and serve with 1 oz. of butter and a dusting of pepper. In the last case the mixture is pressed into a mould and turned out into a vegetable dish.

Young carrots, boiled whole, may be served with parsley sauce made from a lump of butter the size of an egg, half a handful of finely chopped parsley, the juice of half a lemon, and a little seasoning. Toss these ingredients in a pan over the fire for a few minutes, and then pour the whole over the carrots, serving at once.

Carrots with mint-glaze are excellent. To prepare them, wash and scrape about 3 or 4 medium-sized, well-coloured carrots. Slice these into ¼ in. thick rounds, and boil them for 10 to 15 min. Then drain off this water and in its place put 2 tablespoonfuls white sugar and 2 oz. butter. Stir in 1 tablespoonful washed, finely chopped, fresh mint leaves, cover the pan, and let its contents simmer until the vegetable is tender and has a glazed appearance. Then arrange in a hot dish, pour over any juice, and add salt and pepper. A pretty dish is made if a border of cooked peas is added.

CARROT FLY. Carrots are frequently much injured by the larvae or maggots of the carrot fly which bore into and feed upon the roots, causing them to become brown or rusty, and finally rotten. In some cases the growth of small roots is entirely checked. It has been noticed that the pest is worse in dry seasons.



Carrot Fly. A, adult fly. B. maggot. C. chrysalis. D. carrot showing ravages of the maggot (By permission of H.M. Stationery Office & the Ministry of Agriculture)

In appearance the carrot fly is shiny black or dark greenish-black in colour and about 1/5 in. long, with a wing expanse of nearly ½ in. The maggot is yellowish, about ¼ in. long.

The flies appear in spring, and may be seen upon the lower leaves of trees and bushes, especially near brooks

and streams. When the carrot roots are well established the flies lay eggs upon them just below the surface of the ground. When young, the maggots especially attack the outer parts of the carrot.

When it is noticed that the tops of carrots change colour prematurely, the roots should be examined and the infested parts forked up and destroyed. As a preventive measure spraying with paraffin emulsion is recommended. A paraffin emulsion may be made and applied as follows:

Dissolve 1 lb. of soft soap in 1 gal. of boiling water, and, while still hot, add 1 pt. of paraffin and churn the mixture thoroughly.

When required for use add 1 gal. of the mixture to 9 gal. of water, using rain water or water which is not very hard.

Spray the carrots soon after the seeds have germinated and immediately after they have been thinned.

Sawdust impregnated with paraffin laid alongside the plants helps to keep away the flies in early summer. Pressing the earth close round the stems after thinning the seedlings tends to prevent the flies from egg laying.

In localities where the attack of the fly is very prevalent, a supply of carrots can usually be maintained by sowing early varieties in a sheltered position in March, for early use, and again in July for autumn and winter.

CARROT PUDDING. Several puddings of which carrots are a constituent are sometimes known as carrot puddings. One of these is Victoria pudding, while another is made as follows: Mix together with a little milk 4 oz. of grated carrots, the same quantity of suet, flour, and currants, 3 large tablespoonfuls of golden syrup, and the grated rind of a quarter of a lemon. Steam the whole in a basin for 1½ hours, and turn out to serve.

CARROT SOUFFLÉ. An excellent soufflé is made with cold cooked carrots. Rub sufficient through a fine sieve to fill a breakfast cup. Melt 1 oz. butter in a saucepans stirring into it 1 oz. flour. When well blended, add the sieved carrots and stir the mixture over the fire until it boils. Cool it for a minute or so, then beat in the yolks of 2 eggs, and season all these ingredients carefully. A tiny pinch of powdered mace is an improvement.

Put the whites of the eggs on to a plate, and beat them with a knife to a very stiff froth. Fold these whites very lightly, but thoroughly, into the carrot mixture, then turn it either into a buttered fireproof soufflé-case or a greased pie-dish, or into some small fluted paper soufflé-cases. These must only be about two-thirds full, unless a greased paper band is tied round outside the mould to support the mixture as it rises. Bake these soufflés in a quick oven for about 15 min., and, when cooked, add a dust of finely chopped parsley over the top.

CARROT SOUP. In a good recipe for carrot soup only the red part of the carrots should be used. Melt 1 oz. of butter or good dripping in a saucepan, add to it 1 heaped breakfastcupful of the chopped red parts of raw carrots. Turn the pieces about in the butter for 10 min., taking care that they do not colour in the least. Next add 1 quart of stock, and boil the soup gently until the carrots are quite soft, which will depend on their age. Rub the soup through a hair or fine wire sieve, put it back into the saucepan, which must first be rinsed with cold water, and let it re-boil. Mix a level tablespoonful of cornflour smoothly and thinly with a little cold stock or water. Add it to the boiling soup, and stir it until it re-boils, then let it cook gently for about 15 min., removing all grease from the surface.

Season the soup carefully with salt, pepper, a few grains of nutmeg, and ½ a teaspoonful of castor sugar. Lastly, add about ½ a teacupful of carefully-boiled rice. Serve the soup in a hot tureen. If no stock is available use water, adding, if liked, a little meat extract. This is also known as Crécy soup.

CARVERS. This term is applied to the knife and fork that are used for carving food. They differ in shape and make according to whether they are meat carvers, game carvers or fish carvers. Meat carvers have long blades, 8 to 10 in. in length, a usual size for household purposes being 8 in. Carvers for ham and other cold meats are best with long narrow blades. The essentials are a good balance, a well-proportioned handle and a keen edge. The two former are provided by the makers; the latter can be developed at home with the aid of a table steel or sharpener.

Fish carvers are preferably made of silver, but cheaper patterns are made in electro-plate.

Game carvers are shorter in the blade than meat carvers, have longer handles and a different balance. They are usually made of good-class steel, either plain or rustless. The former take a very keen edge. For carving poultry and game, patent secateurs are also used. Fashioned like large curved-bladed scissors, they are equally effective for disjointing an uncooked fowl, or for carving at table. *See* Cutlery; Fork; Knife; Steel.

CARVING FOR THE HOME TABLE

Correct Ways of Cutting Meat, Poultry and Fish

See also the entry Boning; the usual cuts and joints provided by the retailer are given under the headings Bacon; Beef; Mutton, etc.

The correct carving for table of meat, poultry, and fish has considerable influence on the flavour, which may be spoiled by indifferent carving, and is also more economical.

For meat and poultry there are three necessary implements: a good sharp knife with a fairly thin blade, a strong, two-pronged fork, and a steel, which, however, is only required in case of emergency, for the knife should be well sharpened before it is placed on the table or the sideboard.

A good carver will consider the particular tastes of those he is serving, and also take care to cut the meat neatly so that it is not disfigured if brought for the second time to the table. The cook may make the carver's task easier by placing the joint or bird on a dish quite large enough, and also by refraining from filling this with gravy.

It is better when a dish is much garnished to remove the joint on to a flat dish, conveniently placed, to obtain full control for carving.

Figs. 1 and 2 show how, with a pair of forks, the centre bone is removed from a fried sole. It is not considered correct to fillet a fried sole, as the flesh adheres to the forks, but in the case of a grilled sole, by all means, yes. Always remember to cut the fins off with a pair of scissors before cooking. It makes the dish look much more appetising. When carving a salmon avoid breaking the flakes, and cut crossways. Run the knife along the backbone first, then right through the belly. Carve from the head in slices about 1 in. thick, until the middle is reached, when the slices should be only ½ in. thick. When the middle is past, again serve slices about 1 in., until the tail is reached. One side of the salmon is now clear. Take the knife and cut the backbone away from the head, then lift up carefully, using the fish slicer to keep down the fish, when the bone will come right off. Carve the same as before. The best part is the middle, but the tail portion is also liked, and this can be divided into four fillets, by cutting the tail end lengthways from the backbone. By dipping the fish carver in warm water occasionally, the carving is facilitated. Never use steel articles for fish.



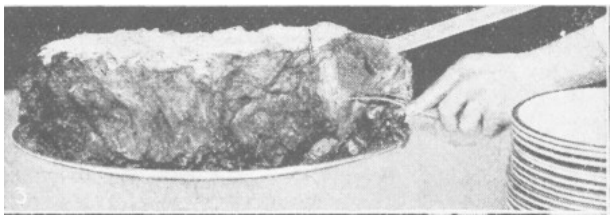


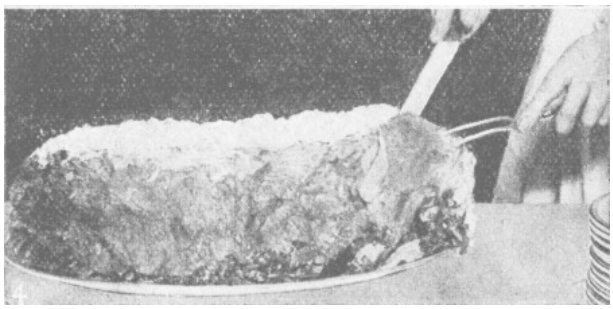
Carving. Figs. 1 and 2. Separating the backbone neatly from the flesh of a fried or grilled sole by means of two forks.

For roast sirloin (Figs. 3 and 4), after loosening the meat from the chine, run the point of the knife along the bone. If the sirloin has the fillet or undercut on it, turn the joint on its back and cut the fillet longways.

York ham is simple to carve (Fig. 5). First cut an incision at the knuckle, remove surplus fat, and proceed to carve. When half-way up the slices should be cut alternately from right and left sides, or they would eventually become as large as a plate.

With a leg of pork the method is naturally similar to ham, but it is advisable to remove the crackling. Then the slices can be cut as thin as required.





Carving. Figs. 3 and 4. When carving a sirloin loosen the meat from the chine and then carve downward.

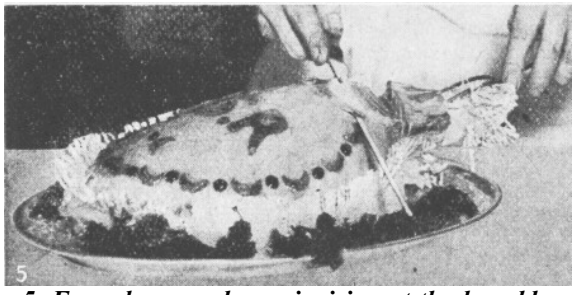


Fig. 5. For a ham, make an incision at the knuckle and carve towards it.

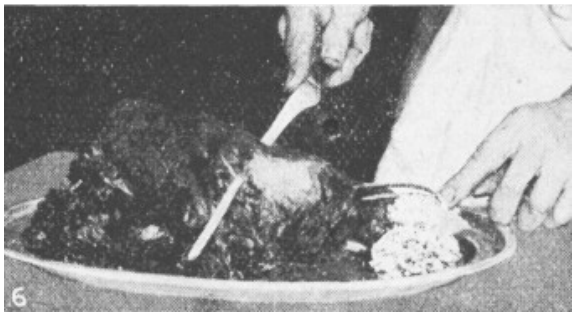
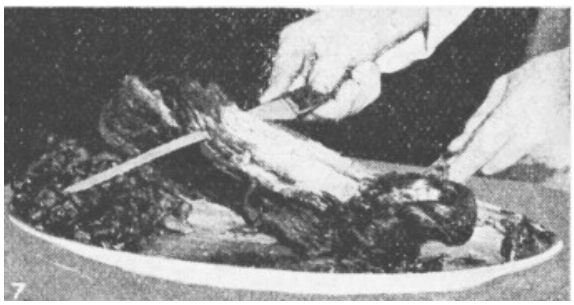


Fig. 6. For a leg of mutton, make an incision and carve fairly thick slices. Fig. 7. For the shoulder, remove fat and carve from blade bone to angle bone.



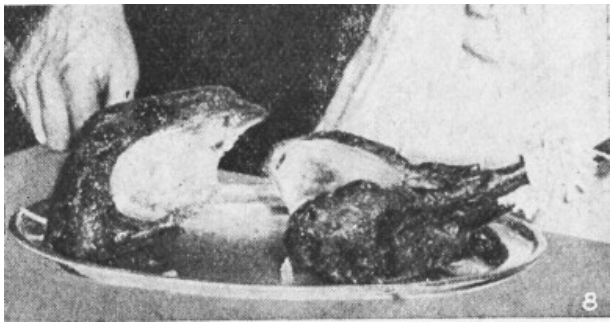
Thicker slices of a leg of mutton (Fig. 6) should be carved than for beef. First make an incision at the knuckle. Continue until a bone at the top of the leg is reached. Then cut left and right sides alternately.

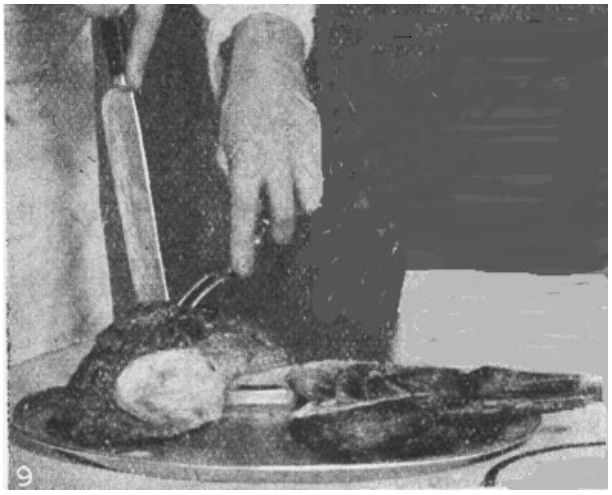
The best way to carve a saddle of mutton is to run the knife along the chine bone, and under the meat along the ribs. Cut down to the bone on the cross, then slices from the outside, which is called the flap. This will make the piece V-shaped. Two slices of cross-cut and a piece of fat are generally sufficient for a meal.

Commence carving a shoulder of mutton (Fig. 7) from the blade bone to the angle bone; this is called the long cut. Then carve the opposite side of the shoulder, giving a slice with the long cut, which will make a good portion. A small piece of the oyster should be served, this being regarded as a great delicacy. It should be remembered to cut down the bone in a rather slanting manner.

In dealing with hare or rabbit, separate the legs and shoulders, and cut the back part into portions. If a knife is inserted into the joint, and the back raised up, the operation is simple.

To carve a fowl, or a pheasant, hold the bird firmly on a dish by inserting the carving fork into its leg, then loosen the legs by cutting skin, following the natural curve of leg. Now turn fowl on breast and cut sharply through backbone. Remove legs from wing (Fig 8). Now cut wings in two-by inserting knife in centre (Fig. 9) and cutting towards and through the wishbone, then repeat operation: by following the first incision and cutting right through the breast the fowl is quartered. The portions can be increased by cutting the wings from the breast with winglets attached, making two portions, and dividing each leg into two. A small slice of the breast should be served with each leg. The fork should never be dug into the breast of the bird.





Carving. Figs. 8 and 9. For a fowl, remove legs, leaving wings intact to enable the carver to quarter the bird.



Fig. 10. When carving a turkey, first separate a leg from the carcass and then carve slices from the breast. (Courtesy of J. Lyons & Co. Ltd.)

Small birds, like plover, quail and snipe, are served whole. Woodcock, partridge, grouse, and pigeon are usually cut into halves.

The carving of a turkey is a similar operation to that for a fowl. Remove the leg (Fig. 10) place the bird on its back, and start carving from the centre of the breast towards the side. The legs should be cut into slices and served with pieces of breast and stuffing.

The carving of a goose is similar to that of turkey. With a roast gosling remove the legs as in the case of turkey, then cut the wings away, leaving the breast. Carve the breast crossways into four, serve one piece to each half of leg, which with the wings will make six portions.

To carve a duck, remove the legs, and, if desired, cut them into two. Then remove the wings. A small portion of the stuffing should be served to each person.

CASCARA. By reason of its gently laxative action cascara is very useful in medicine. In chronic constipation cascara sagrada is much used. The commonest preparations of this drug are the dried extract, dose 2 to 8 grains, the liquid extract, dose ½ to 1 teaspoonful, and the aromatic syrup of cascara, dose ½ to 2 teaspoonfuls. The dose of each preparation varies in individual cases, but it should be just sufficient to ensure one motion each day, and when fixed it should be adhered to. The dry preparation may be taken in tablets.

As cascara also has a bitter principle which makes it more or less of a carminative, it is a valuable drug in cases where constipation is accompanied by much flatulence. In habitual constipation a single dose of 5 or 6 grains of the dried extract, or a teaspoonful of the liquid extract, may be taken at bedtime, or smaller doses, 10 to 20 drops of the liquid, or a grain of the dried extract, may be taken before each meal, 3 times a day.

The aromatic syrup may also be used in appropriate doses. To cover the exceedingly bitter taste of the liquid extract it may be mixed with an equal amount of liquid extract of liquorice and taken with a little tincture of orange or chloroform water. *See* Aperient; Constipation.

CASCARILLA. This dried bark has aromatic bitter properties, and two medical preparations are made from it. The infusion, dose ½ to 1 oz., which does

not keep well, especially in warm weather; and the tincture, dose ½ to 1 dram. It stimulates appetite and digestion and makes a useful tonic in convalescence from an acute illness. A tablespoonful of the following may be taken thrice daily in a wineglassful of water, at or after meals: Tincture of cascarilla, 6 drams; tincture of orange, 3 drams; syrup of orange, 4 drams; chloroform water to 6 oz. *See* Appetite; Diet.

CASE HARDENING. This process consists in increasing the carbon content of the surface of a steel relatively low in carbon, so that by being heated and then quenched it can be hardened like other steel. Simple case hardening may be carried out by any amateur. As an example, suppose a new cone has been made from ordinary mild steel, and that it is desired to harden the surface. When sufficiently heated and surrounded by carbonaceous material, mild steel will absorb carbon, and the longer the time the steel is in the carbonaceous material, the deeper becomes the case hardening effect.

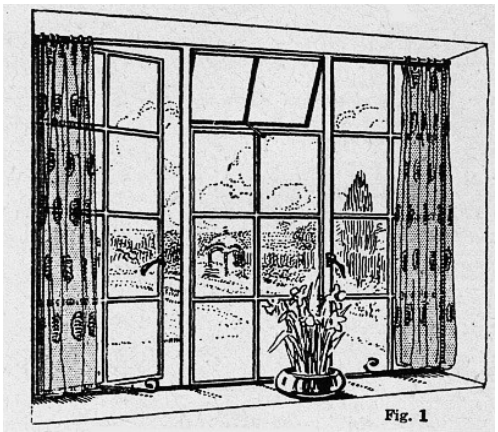
Having obtained a metal box, take some clean old bones, crush them up as finely as possible, sprinkle a layer of the bone dust on the bottom of the box, place the cone in position, and pack it all round until it is buried in bone dust. Fix on the lid by means of a catch, or wire it on with steel wire. If a very hot fire can be raised in the kitchen stove, this may be used as a furnace wherein to heat the box thoroughly and its contents. This must be kept glowing red-hot for half an hour or so, when it may be removed from the fire, the lid knocked off, and the contents dropped on to the hearth. The cone can then be picked up with a pair of tongs or pliers and dropped into cold water.

If several pieces are to be case hardened, it saves much trouble to purchase one of the ready mixed carburising compounds sold for the purpose. *See* Hardening.

CASEIN. Organic substance contained in milk and cheese, being the essential ingredient of the latter. Casein can be desiccated and prepared as a substitute for eggs in baking, as the basis of an enamel paint, and as a substitute for glue in the making of cement. *See* Cheese.

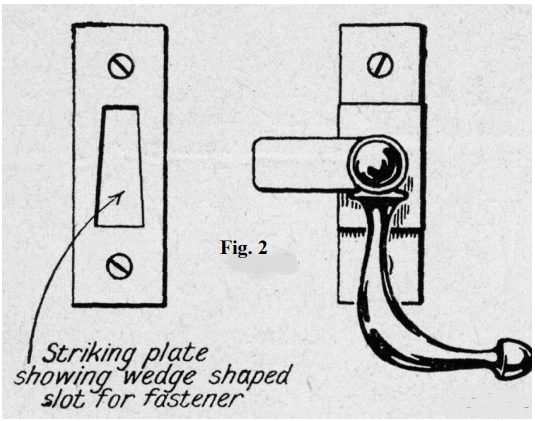
CASEMENT: Of the House. In domestic architecture the casement is a window in which the sash is hung upon hinges to open like a door. The expression, the casement, is generally understood as referring to that part of the window that opens and shuts. By casement window is meant a window of the cottage type, and as a rule made with multiple panes of glass.

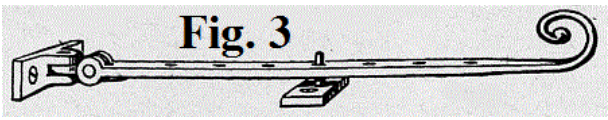
Commercial casement windows are made in a wide variety of patterns and sizes; those commonly in use measure 20 in., 39¼ in., and 58½ in. in over-all width, and either 3 ft., 4 ft., or 5 ft. 1½ in. in height. The total area in square feet of all the casement windows in a room should never be less than 10 p.c. of the floor area; and preferably more than this for efficient lighting and ventilation. Various combinations of the windows enable requirements to be met. By having one casement to open on the left hand and another on the right hand, with possibly a transom or top hung casement, at least one window can be open in any weather (Fig. 1). The one that opens with its back to the wind or rain very seldom permits the weather to enter the room.



Casement. Fig. 1. Metal casement window.

The modern tendency is to use the casement window in preference to the sliding sash type; it is made either in wood or metal. The latter has many advantages, for metal windows are wind and weather proof; they are not affected by moisture, and they never jamb or stick in their frames. Another advantage is the greater glass space in a frame of given size, metal framing not being so wide as wood.





Casement. Figs. 2 and 3. Fastener and stay for wooden casement.

Existing window openings can often be converted for casements by removing the old frames and setting the new ones in concrete. For this purpose the metal casement is provided with lugs or flanges, which are embedded in the concrete. In the case of a wooden framework, or when fitting a metal casement to a wooden dwelling of the bungalow type, the metal frame is simply screwed to the framework, and the joints

made good on the outside with a fillet of wood, and on the inside by boarding up the jambs and finishing the work with an architrave or moulding.

Wooden casement windows sometimes give trouble by swelling and jambing in their frames, the best remedy is to remove the sash and plane the edges until it can close easily. Should the window have warped, the beading or stopping around it should be removed and re-fixed. To ensure a close fit, shut the window and, when refixing stopping force it closely against the window sash.

Casement fit-tings include fasteners to keep the sash tightly closed, and stays to adjust the amount of the opening (Figs. 2 and 3). Those made of malleable iron are cheap, and some good patterns are on the market, but unless the joints be well lubricated they soon suffer from the dampness, and then exhibit signs of rusting. Brass fastenings are preferable, as they are not affected in this way. It is important when fitting the fastener that it should draw the sash closely against the stopping, for which purpose the rubbing plate is generally made tapering or wedge-shaped. When newly fitted the fastener should draw the window up tight when the fastener is just at the bottom of the wedge-shaped part. This allows for future wear.

Fittings that have been in use for some time may have worn, and the fastening is then insecure, allowing the window to rattle and admit a draught. This is remedied by resetting the fastener, recessing it further into the frame, or by packing out the rubbing piece. *See* Blinds; Burglary; Curtain; Window, etc.

CASEMENT CURTAIN. These curtains are made of the same depth as the casement, and drawn along rods fixed to the frame. They are provided with rings sewn on to the base of a hem about 1 in. deep, and made with a drawtape, which allows a perfectly even distribution of the fullness.

The rods should be accurately measured and have proper brackets. The rings should be threaded twice with a cord, so that they can be drawn or undrawn. Each casement will have its own curtain, and if, as is usually the case in a bay-window, there is a row of lights above the casements, these should be provided with curtains. In this way light can be regulated more easily than by the single pair.

The use of these curtains is not confined to casement windows, they are employed in place of blinds for small sash-windows, and also in full-sized sash-windows, one pair of curtains being allowed for each sash. They are made of various washing materials of casement cloth, cretonne, shantung or Bolton sheeting. The term casement curtains is sometimes loosely used for any short curtains, but here it applies only to curtains as shown in Fig. 1 on this page, which are fixed within the window frame. *See* Curtain.

CASHMERE. Real cashmere is a superlatively soft wool or hair forming the under coat of the Kashmir goats of Tibet and the Central Asian plateau.

Many goods made not from goat hair, but from fine wool, are customarily known by this name. Cashmere stockings and socks are ordinarily made from fine-spun merino wool. Cashmere suitings and dress materials are made from the finer qualities of worsted. The real cashmere wool is used in high-grade knitted wear. See Shawl.

Cash on Delivery. *See* C.O.D.

CASSAREEP. The juice of the cassava-root with the addition of several native spices, yields the condiment known as cassareep. It is introduced largely into a West Indian pepper-pot, and enters into the composition of many sauces.

Cassava. *See* Tapioca.

CASSEROLES AND CASSEROLE COOKERY
An Economical Method which Conserves the Flavour of Food

See Beef; Chicken; Game and also the articles on allied methods of cooking, e.g. Braising; Stewing

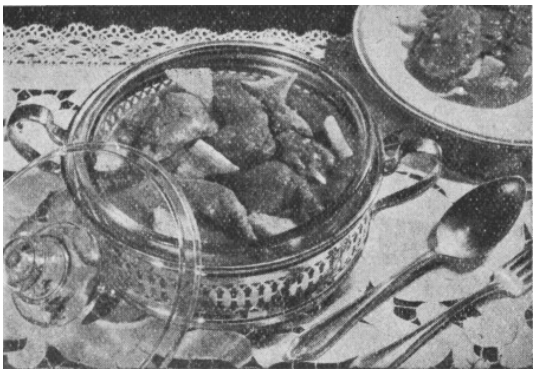
This process is slower than that required by ordinary utensils, but, on the other hand, less fuel is required, the food is cooked evenly, and none of the valuable juices are allowed to escape in steam. It is on this account the most wholesome form of cookery. Owing to the elimination of waste, even inferior cuts of meat can be used with advantage. French cooks were the first to realize the advantages of casserole cookery, and it is extensively used in that country. Braising is carried on to perfection in a casserole.

Quite a number of dishes can be cooked in a casserole, and are best brought to the table therein. This saves re-dishing, ensures the food being served really hot, and reduces the labour of washing up. Also, it is a most convenient method of cookery for the busy housewife, as the food is cooked without constant attention and can be kept hot for a long period for any late comer to a meal.

A useful casserole which can be placed on a gas boiling burner, turned low to a blue flame, has an outer casing with a turned-in rim, forming a cavity into which heat ascends until the food inside the casserole is cooked.

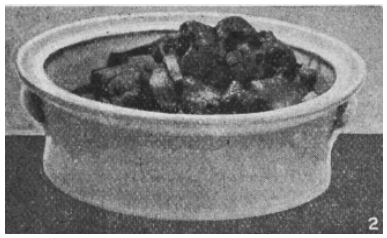
Casserole of Chicken. Fowls cooked in this way can be successfully made tender and succulent even when they would be otherwise tough. Cut a fowl into neat joints and season each with pepper, salt, and a pinch of pounded mace. Put some slices of bacon at the bottom of the casserole and lay the chicken or fowl on these. Having sprinkled over them a finely-minced onion, pour over all half-pint of white stock. This done, the casserole can be covered and placed in a moderate oven for an hour, or it can be placed on the hot-plate of a range and the contents simmered for an hour. If a gas stove is used a thin iron plate or an asbestos mat put over the stove will enable the casserole to simmer thereon. This recipe can also be used for other poultry

or for game. The casserole illustrated (Fig. 1) is of glass with a plated silver mount for table use.



Casserole. Fig. 1. Casserole of chicken, for cooking a tough bird.

Ways With Meat. One of the beef dishes that can be cooked in a casserole is the shin. Take 1 Il, of this and, after wiping it, cut it into small pieces and add four slices of fat bacon. Then place it in the casserole with two finely-minced onions, a scraped carrot cut into small pieces, some mushrooms or mush room ketchup, and a pint of stock. Bring it to the boil and let it simmer for three or more hours. Strain the gravy and add a dessertspoonful of flour smoothly mixed with cold water, or, if preferred, with a glass of claret. The beef can then be returned to the casserole and again allowed to simmer.



Casserole. Fig. 2. Beef casserole served in an earthenware dish.

Fig. 2 shows this dish ready to be served in the casserole. Oxtail is also an excellent choice for casserole cooking. Having cleaned the tail and cut into pieces, fry them in 2 oz. of butter or dripping. When the pieces are a rich brown, put them into a casserole, and cook in the remaining fat 1½ oz. of fine flour, then, by degrees, add 1½ pints of good brown stock, and let all boil together, stirring till smooth. Pour this over the tail, and add 2 carrots, 1 turnip, and 2 onions, all prepared and cut up small.

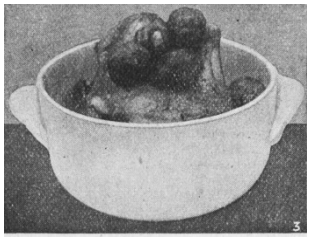
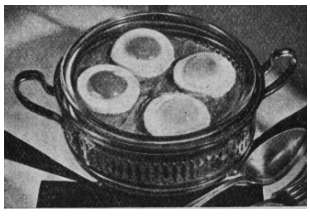


Fig. 3. Casserole of oxtail, to which carrot, turnip and onion are added, the whole cooked in a china dish.



Casserole. Fig. 4. Appetising breakfast dish of fish, haricot beans and eggs, served in a glass casserole.

A bouquet garni and a little spice, with a few peppercorns, should be tied in a muslin bag and put in with the vegetables. Simmer gently over the fire or in the oven from 2 to 2½ hours, pouring in a little more stock if required. Before serving, the gravy must be cleared from fat and the spices and bouquet removed (Fig. 3).

Cod with Artichokes. Among che fish that can be cooked in a casserole are cod, haddock, hake, plaice, salmon, sole, turbot and whiting. A good way with cod is to flake 1 lb., peel 4 Jerusalem artichokes, and put them into the casserole with ¾ pint milk, 1 oz. butter, a dessertspoonful minced onion, pepper and salt to taste. Cook gently in the oven until the artichokes are soft, then add sufficient melted butter sauce to cover, bring to the boil, add a squeeze of lemon-juice and garnish with finely-chopped parsley before serving in the casserole.

Earthenware for Vegetables. As regards vegetables, cabbages, cauliflowers, spring greens, spinach, turnip tops, green peas, celery, brussels sprouts, and French beans can be cooked in a casserole, preferably an earthenware one. For a medium-sized cabbage 1 gill of water and 1 oz. of fat should be placed in the casserole, which should then be covered. Corresponding amounts of water and fat should be used for other vegetables. The vegetable should be cooked gently and stirred now and again until it is tender. It should be seasoned with salt and pepper, and served very hot in the casserole. Celery is particularly good braised in a casserole. First par boil the celery for 10 min. in salted water and then drain it. Place in the casserole with sufficient boiling brown stock to cover the celery and put in the oven till tender. Serve with chopped parsley and a chopped, hard-boiled egg sprinkled over the top. Fruit cooked in syrup, to be afterwards served cold, is better stewed in a casserole, as not only is the flavour conserved better, but also the colour and shape.

Before being used, a casserole, if of earthenware, should be toughened or seasoned by filling it with cold water to which a handful of salt has been added. Bring the water slowly to the boil, and then leave it to cool in the casserole. Another method is to melt some fat in the pan, smear it well all over the inside and out, and bake it in a cool oven. A casserole is best used in the oven or on the hot-plate of a kitchener, and should never be placed directly over a fire or a fully-turned-on gas-jet. Glass casseroles should be used in the oven only. The food in these is cooked not only by the hot air of the oven, but also by radiation of the glass.

Breakfast dishes are appetisingly served in glass ware. A good recipe is made from 1 lb. of left-over cod or haddock, two boiled and mashed potatoes, 1 lb. haricot beans, boiled and pressed through a sieve, and four poached eggs. Make ½ pint anchovy sauce, place with flaked fish in casserole, add potato and put beans on top of these, also several dabs of butter. Heat slowly in oven and before serving place poached eggs on top

(Fig. 4).

To clean casseroles, wash them inside and out with hot soapy water to which a little soda has been added, and rinse them with warm water. In case of very dirty pans, fill them with cold water containing a little soda and place them on a hot-plate to heat the water and so loosen the dirt. Stains may be removed with sifted ashes or silver-sand.

CASSIA. A group of trees and shrubs ot which only cassia corymbosa is commonly grown in British gardens. This is an evergreen shrub, 6 ft. or more high, which bears yellow, pea-shaped flowers freely in summer; it is not hardy and must be kept in a warm greenhouse for the winter. It will cover the back wall of a greenhouse if planted in a border of loamy soil, or it may be grown in large pots and used in flower beds in summer. Propagation is by cutting under glass in spring.

Oriental varieties of the same shrub provide the purgative senna leaves of commerce. Further species include the Hashish, or Turkish dream drug.

The bark of the cassia used in cookery resembles cinnamon in appearance, smell and taste. *See* Cinnamon.

CASTING IN IRON, LEAD AND BRASS

Methods and Equipment for the Amateur Metal Worker

A knowledge of this subject will help materially in making many of the articles described in this work. See also Lathe; Metal Work; etc.

While casting in iron can only be done effectively in a foundry, the non-ferrous metals like lead and brass offer plenty of scope for the amateur who has provided himself with the necessary tools, which are neither numerous nor costly. Such work has a particular attraction for many, and it is quite unlike any other mechanical process. For casting in lead, one or two iron ladles, a wire skimmer or spoon for removing the dross and a few simple modelling tools are all that are necessary. The lead can be purchased from most ironmongers or plumbers, as can the fine plaster of Paris used for the moulds. For casting in brass or aluminium a furnace is necessary. The addition of a few plumbago crucibles, a pair of crucible tongs, moulding sand, and flasks or moulding boxes, complete the equipment.

Casting in Lead. For first attempts at casting the amateur will be well advised to used lead or type-metal. Wooden moulds can be used, and the lead melted in an iron ladle over the kitchen fire. Cast lead panels or plaques can be modelled in wax or plasticine, and cast in plaster moulds, the lead casting being carefully scraped wherever any rough edges or faulty places develop. Almost any simple article can be made after first planing up some soft wooden blocks of appropriate size.

In making a wood mould of an article to be cast, some skill in woodworking is required, since the mould must be a replica of the article itself in reverse, and a core must be provided if the article is hollow. The following system avoids a great deal of this trouble and produces excellent results. The first thing required is a replica of the desired casting: this can be an existing object, such as a toy soldier, or the article can be modelled in wax or plasticine. However it is made or obtained, the remaining processes are the same. The object is rubbed over with vaseline, then slightly warmed to ensure the vaseline flowing into every crevice, and the surplus is wiped off. Next stand the object on a piece of glass, a tile, or a smooth board, well greased, and make up some plaster of Paris into a thick paste. This is best done by putting some cold water in a bowl and sprinkling the plaster on to it, stirring the water gently all the time and always in the same direction. Continue adding plaster until the mixture is thick and sticky (like clotted cream, but not so thick).

Heap the plaster up and around one-half of the model, keeping the plaster in place with a temporary wall of clay or plasticine which has been previously built up. Allow the plaster to set, which will take about twenty min. or less, remove the clay and the model, and clean up the surface of the plaster to a flat face, using an old table-knife. Drill two or three holes into the body of the plaster, and fix into it little wooden pegs with rounded ends. These should protrude about ½ in. from the face of the plaster, and enable the two halves of the plaster mould to be put together in proper register. Replace the model, vaseline the face of the plaster, and well vaseline the pegs. Then build up the other half of the mould with plaster as before. The result is as in Fig. 1.

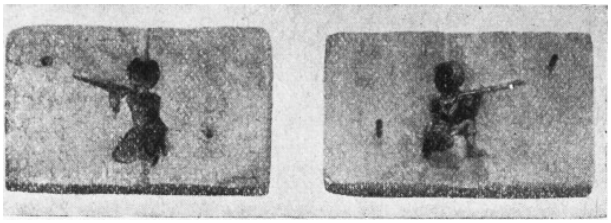


Fig. 1. Plaster mould for casting a toy soldier. Left, a hollow half mould, right, the other half, with the casting in place.

To cast from such moulds, remove the model, wipe off as much of the oil from the vaseline as possible, and coat the interior with powdered blacklead. Then tie the two pieces of the mould together with string and pour in the lead from what will be the bottom of the model. Some elaborate models will require the moulds in three, four, or more parts to enable them to be removed from the casting without being damaged.

When it is desired to make a hollow lead casting, it can be done in one of two ways. An ordinary mould can be made, the lead poured in, and immediately poured out again. As the skin or surface in contact with the mould is the first to chill and set, only the interior parts will be molten, hence a more or less hollow casting is the result. A similar method is used commercially for casting lead toys and for similar purposes. Disad-

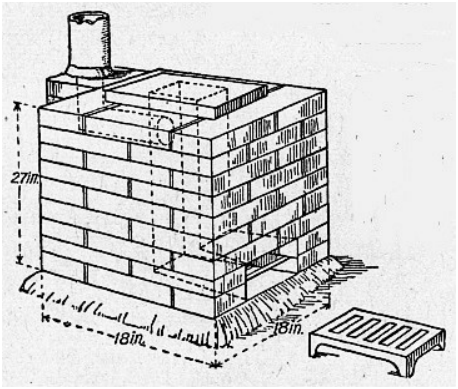
vantages are unequal thickness in the casting, frequent distortion, and a tendency for holes to form in the outer surface.

A better plan is to make a rough plaster model, somewhat smaller than the finished model, then to coat the exterior with dental modelling wax, and shape this to the desired form with modelling tools. Three or four wires are then driven partly into the model in the least conspicuous places, and the composite model coated with plaster as before, except that the whole model is entirely covered, the only openings being the venthole for the exit of air and the gate or entrance for the molten metal.

When the plaster is quite dry it is placed in a dish in a hot oven with the gate downwards, the heat melting the wax, which flows out of the mould into the dish. The plaster core remains in position, as it is held firmly by the wires. A space must be hollowed out in the wall of the mould around the gate to form a trough into which the molten lead may be poured. The lead flows into the space hitherto occupied by the wax, and when cool the mould is broken open and the casting removed. The plaster, in the interior can be chipped out with a small chisel, and the holes made by the pegs closed up with a spot of solder.

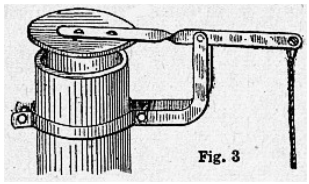
It will be seen that this system requires an opening somewhere in the casting to enable the plaster to be removed; generally this can be arranged under the feet or at the back. When using plaster or metal moulds it is desirable thoroughly to warm them before introducing the molten metal.

Casting in Brass. A simple furnace suitable for melting brass or small quantities of iron is illustrated in Fig. 2, and can readily be made from bricks. The furnace is 18 in. square, built with nine courses of bricks set in cement on a concrete foundation 4 in. thick. The interior is lined with fireclay, poured in when wet, and is formed by means of a wooden core or box 6 in. square: the flue is similarly cored with a 3¼ in. diameter wooden block. At the back of the furnace other bricks are set up to support the chimney, which is made from 4 in. diameter stove pipe, and is 24 ft. high, for, which reason it is desirable to place the furnace outside the house and against a solid brick wall to which the chim-ney is attached.



Casting. Fig. 2. Simple brick furnace suitable for melting brass or small quantities of iron.

The grate is made from a regular stock cast iron fire grate and is supported on two bars of iron built into the brickwork. The top of the furnace is closed by a fire brick 12 in. square and 2 in. thick. All joints are made airtight with fire clay. In use, a fire is made with gas coke worked up thoroughly hot, the furnace again filled with coke, and the crucible set in position on top of the fire. The lid is then placed on the furnace top and luted or made airtight with fireclay. A damper at the top of the chimney is a convenience in regulating the fire, and is operated by a long wire, as in Fig. 3.



Casting. Fig. 3. Furnace damper.

Such a furnace should melt 5 lb. of cast iron in ¾ of an hour, brass being melted in much less time. After every heat the fire grate must be pulled out and the slag cleaned away with a rake or scraper, as if allowed to cool off it will adhere to the lining of the furnace and be difficult to remove.

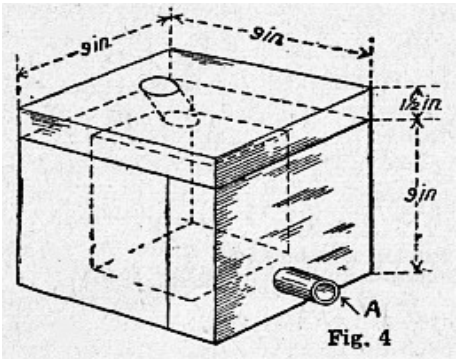


Fig. 4. Simple gas-heated furnace.

Where gas is available a very simple furnace can be rigged up by using the gas blow pipe as a heating medium. The furnace is simply built up from fireclay bricks, well jointed with fireclay and provided with a lid and a bottom of the same material, as in Fig. 4. The lid has a small and slanting hole about 1½ in. in diameter cored through, and a hole is left in the side of the furnace to receive the nozzle of the blow pipe. The gas is then turned on and lighted, the bellows operated steadily, and the gas adjusted until the flame entirely fills the furnace and flares out of the hole at the top.

Useful tools for handling the crucibles are illustrated in Fig 5, and can all be made from wrought iron. The tongs have curved ends to encircle the crucible, the two rakes are for skimming the dross off the top of the metal, and the circular tool with a handle is used to assist in holding the crucible while pouring the metal into the mould. A fine wire mesh sieve is needed for sifting the sand before mixing, also a small trowel and a few modellers' spatulas are useful to make good any damaged places on the mould.

Moulding sand can be bought ready for use, but some ordinary fine building sand obtained from a builder's yard can be used for early work. It is prepared by drying and sifting through a very fine wire sieve, then damping with water and thoroughly mixing on a piece of clean board into a moist mass. As a test of suitability take a lump of sand in the hand, squeeze it tight and on opening the hand if the mass

shows no tendency to crack or fall to pieces, it can be used for moulding, otherwise add 5 per cent, by weight of clean, thoroughly dried clay, which has previously been pounded with a hammer and sifted through the fine sieve. After mixing, damp the material to make it cling together. Moulding boxes can be made from wood 1 in. thick, just like an ordinary lidless box but with triangular corner pieces glued and nailed to the inner corners as in Fig. 6. The boxes can be any size to suit the work and are made up solid and then sawn asunder. The ends should have dowel pins or guides to make them register properly: the parts are kept together with a hook and eye on each side Note the holes (A and B) drilled to act as a gate for pouring in the metal, and for a vent which allows the steam or gases to escape; when the metal overflows at this latter hole it indicates that the mould is full.

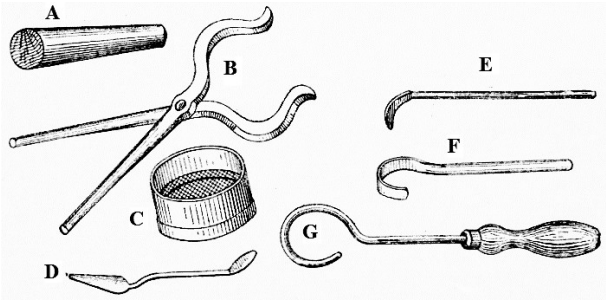


Fig. 6

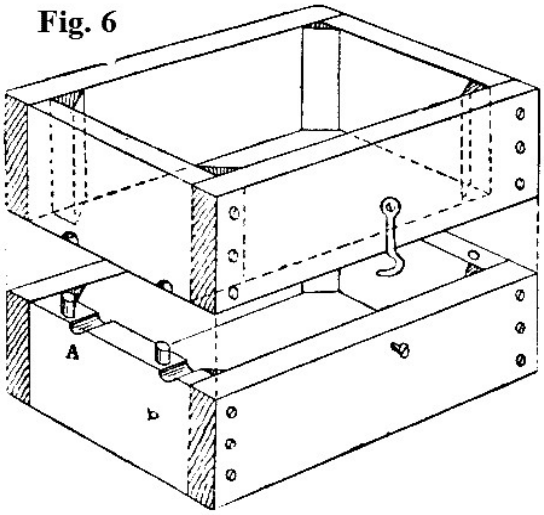


Fig. 7

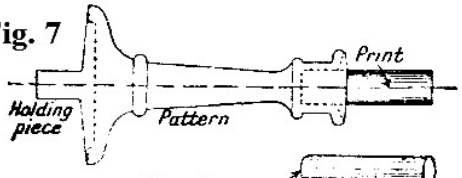
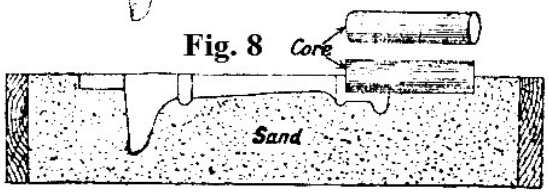


Fig. 8



Casting. Fig. 5. Usefool tools employed in casting. A. Hardwood rammer. B. Crucible tongs. C. Sieve. D. Double-ended towel. E. and F. Skimmers or rakes. G. Crucible ring or hook. Fig. 6-8. Moulding box, pattern and core for casting an aluminium candlestick.

In use, the wooden frame is laid on a wooden baseboard and filled with damp moulding sand rammed in tight and levelled off flush with the sides. The model or pattern is now pressed into the sand until half the pattern is embedded, and the surface is then finished off level with the sides. Place the top box on the lower one, sprinkle the surface of the sand in the lower box with dry parting sand, that is finely powdered fire-brick dust, and then fill the top box and ram home the sand.

Preparing the Mould for the Metal

Separate the two, remove the model or pattern by rapping it with a stick, dust the surfaces with fine charcoal, cut a passage way to the gate, and another to the vent, also drive a knitting needle through the sand in one or two places from the cavity formed by the pattern, these to act as additional air vents. Replace the top box, and clamp them both together, then pour in the molten metal. The brass casting will come out much cleaner if a little powdered resin is sprinkled over the mould faces prior to replacing the top box.

The amateur can use new brass obtained from the metal merchants. Ornamental drawer handles, door fastenings, keyhole plates, and similar cabinet fittings may be cast in brass. A number of small models might be cast together in the same box, the cavities being joined by a channel to allow the molten metal to flow from one to another. The thin bonding piece thus produced is easily removed when the casting is cold. Aluminium is cast in much the same way, but larger pouring gates and ample air vents are needed. The metal should not be overheated and should be poured as soon as properly melted.

Plaster casts can be made in plaster or wood moulds. The plaster is mixed to the consistency of thin cream and poured in the same way as if it were metal. The moulds must be well oiled with lubricating oil prior to putting in the plaster. The surplus oil is poured out before casting.

Fig. 7 is a pattern of a short candlestick cast in aluminium. It should have the base recessed so that it will stand steadily on a surface that might not be quite flat; the top should be hollowed slightly, so that the melted grease will not run over the edge. If the pattern were made thus, however, it could not be lifted from the sand of the mould, so the preliminary pattern differs a little from the finished article.

In Fig. 7 the outline shows the pattern itself, and the heavy dotted lines show the details of recessing the base and candle holder. The candlestick is best finished by turning in a lathe, and therefore a piece is shown projecting from the base, to be held in a self-cen tring chuck, or for a carrier to be put on it and the candlestick held between the centres of the lathe.

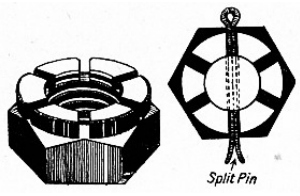
The projecting piece at the other end is termed a print, and will not appear in the casting, as it produces the hole for the candle. The laces of both ends are slightly conical to allow the pattern to leave the sand easily.

A core is required, as shown separately in Fig. 7, and

in position in Fig. 8. It should be of the diameter of the print. Its length should be that of the projecting print plus the depth of the hole required in the top of the candlestick, shown by the dotted lines. This core can be made out of ordinary bath-brick sawn and filed to the required shape. When the pattern has been taken from the sand, the core is placed in the impression which was left by the print, and butting against its end (Fig. 8). The melted metal will flow round the core, and this will produce the hole for the candle. The print should not be made any shorter than shown, or the melted metal might float it up. When the casting is taken from the mould, a metal plug can be fitted to the hole, so that the work can be centred to run true in the lathe, and it can be turned all over. The base can be turned flat and recessed, and then with a pointed tool the projecting piece can be parted off.

CAST IRON. Although one of the cheapest metals, cast iron is of little use to the amateur worker, except in the form of small castings for the construction of little engines and other mechanism. It is widely used for all kinds of domestic appliances, from drain pipes to gas stoves, and, being brittle, must not be struck with a hammer. It can only be satisfactorily repaired by autogenous or acetylene welding. In drilling holes a hand-drill or brace and a sharp twist drill are employed, but no lubricant must be used upon the drill; if it shows a tendency to heat, it should be cooled with a few drops of water.

CASTLE NUT. This is the name that is given to an engineer's nut having a projecting portion which is slotted; it is secured by a split pin, inserted through a hole drilled in the bolt. The provision of six slots enables the nut to be tightened up to a nicety, 1/6 of a turn sufficing to bring a slot opposite the hole in the bolt.



Castle Nut. Left, nut removed. Right, nut in place on bolt with split pin inserted but not fully bent over.

To unscrew a castle nut, the split pin must first be removed by bending the ends of the pin and straightening them as much as possible with the pliers. The pin is pulled out with a pair of pliers or a split pin extractor .The nut can then be removed with a spanner.

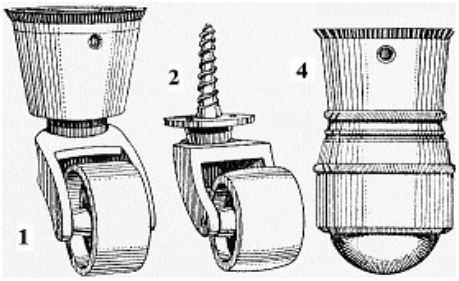
CASTLE PUDDING. Whether baked or steamed, this is usually made in small moulds or cups. Choose two good sized eggs, lay them on the scales where the weights are usually put, and weigh against them first butter, then flour, and lastly castor or granulated sugar, the former being best.

Beat the butter and sugar to a cream and add the eggs one by one, beating each well in. Next add the flour and a good saltspoonful of baking-powder. Stir these lightly in; lastly add two tablespoonfuls of milk. Turn the mixture into some well-buttered moulds and either steam them for about 45 min. or bake them, when they will only take from 25 to 35 min. Turn them out on to a hot dish, and make a little hollow in the top of each and put in a small spoonful of jam.

CASTOR: How to Fix. The kinds of castors mostly used comprise the socket, screw and plate sorts; to these may be added bedstead leg and truck castors and glides.

In dealing with a socket castor (Fig. 1) not only must height be carefully observed, but the diameter of the socket at its mouth, because any difference in this part will mean either packing for a size too large, or paring the wood if too small, in both cases inadvisable to attempt. It often occurs that a screw castor (Fig. 2) will break, and that the stump of the screw will remain in the wood, this should be removed by the help of a strong pair of pincers.

Plate castors (Fig. 3) are standardised into sizes, and made with either iron bowl or wheel, or wood, the last named being better for domestic use. These, being attached by screws in the plate, are easily fixed, and simple to attach to any chest or piece of furniture for the first time.



Castor.

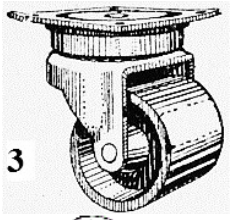
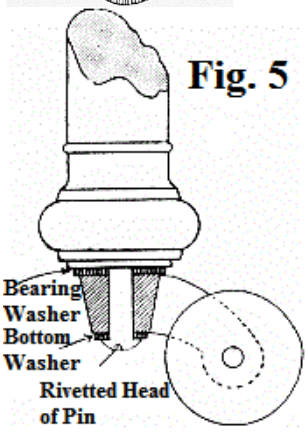


Fig. 1. Socket castor.
Fig. 2. Screw castor.
Fig. 3. Roller-bearing plate castor.
Fig. 4. Ball castor.
Fig. 5. Diagram illustrating how to replace the castor on the leg of a bedstead.



Ball-bearing castors may be procured in either socket or screw patterns, the object of such being to make movement more rapid and easy; but whether such castors are satisfactory is an open question. Glides are extremely useful if in the correct position, and can be driven home by means of a hammer with a piece of wood to protect the glide. Glides are made circular or triangular but the former is recommended as being best. Fig. 4 shows a common

type of ball castor made in a number of sizes for chairs, tables, etc.

To replace a bedstead castor (Fig 5), first remove the old castor, taking care that the pin of the bedstead is straight and the edge of the burr at the end filed off before attempting to fix the new castor. If the chill or casting at the foot has been allowed to become worn so as to have spoiled the seating against which the castor is to work, it may be found helpful to place an iron washer under the castor to form a new seating, but this should not be done unless absolutely necessary. The castor being in place, add a small washer on the top and then rivet over the peg, which will, if sufficient turnover be given, retain the castor in its working position.

To fix a set of socket castors where none has previously been used will need careful and accurate use of chisel and gouge, taking precaution that the tapered wood end of the leg, be it either table or chair, is exact in the length of the taper, as well as being correct in the extent of its tapering. Use a screw gimlet for each screw hole so as to give every screw a good start, and be careful, especially in dealing with oak and mahogany, in both of which it is easy to get a split, to turn the screw gently and quite straight. It must also be remembered that the outside of the socket should be flush at its mouth with the wood of the leg as it enters when in place. *See* Armchair; Chair; etc.

CASTOR: For Table Service. A pepper castor is often called a pepper pot. Sugar castors are made of silver or electro-plate, or of glass with a silver sprinkler top. Remove the top from the pot when cleaning it, and if it is all silver, empty the sugar out. Caked sugar is removed from a glass pot by filling it with hot water and letting it stand. *See* Pepper Pot; Silver.

CASTOR OIL. This oil is a good purgative, especially for children. In doses from half to two tablespoonfuls it is often taken by adults.

Varying from 15 drops for a three months infant to a teaspoonful or more for a two or three year old child, castor oil is a remedy which can usually be prescribed with benefit at the onset of most infantile disorders. Instead of plain oil, the B.P. mixture of castor oil may be taken. The dose is one to four tablespoonfuls.

Where in a grown person there is diarrhoea, caused by the irritation of undigested food in the intestines, one to two tablespoonfuls of castor oil, to which has been added 10 to 15 drops of tincture of opium (laudanum), is sometimes a very effective cure.

To disguise the taste it may be taken floating on a layer of peppermint water, and covered with a thin layer of brandy. *See* Constipation.

CASTOR OIL PLANT. This is the common name of Ricinus communis, a member of the spurge family, which is grown for the sake of its large, handsome leaves and sometimes used in sub-tropical flower beds for the summer. There are varieties with leaves of different colours, e.g. Gibsonii, bronze, and cambodgiensis, dark crimson. The plants are raised from seeds sown in loamy soil in a warm greenhouse in February, the seedlings being potted finally in 5-inch pots and planted out early in June. They may be placed in larger pots and grown for conservatory decoration. The plant correctly named Aralia Sieboldii is also called the castor oil plant.

CASTOR SUGAR. The highly refined form of cane-sugar known as castor sugar is a fine, white, glistening powder. It is much used in cooking and confectionery, being specially suitable for preparation of cakes, puddings, etc., or for sprinkling over fruit. *See* Cake: Sugar.

CATS: VARIETIES AND CHARACTERISTICS
With Hints on the Care of these Domestic Pets
Other articles in this group deal with Dog; Rabbit and other animals kept in the household

When only one or two cats are kept, no special accommodation need be set apart for them, but if catting on a more extensive scale is desired, a box-room or light and airy attic makes a suitable abode, while a substantially built wooden house makes an ideal garden, backyard, or general out-of-doors cattery. Cats stand any reasonable amount of cold, but damp and draughts are fatal to success, if not indeed to the animals themselves. A sunny room or a cattery situated in a sunny aspect is a big asset in cat-keeping, as felinity loves sunlight, and one of a cat's greatest pleasures is to lie on a shelf or other resting-place at the window, and while enjoying the sunlight, taking a keen interest in all that it sees outside.

Whether kept in a special room or cattery, or simply as a house cat, the animal should have its own bed, which may be a basket with a blanket in it, but a roomy box, raised a few inches from the ground, and thus above floor draughts, is preferable. A cube sugar-box makes an ideal sleeping-place. The lid should be removed, and the box placed on its side; the upper side then forms a roof which keeps off draughts, while if a broad spar of wood is nailed along what is now the front of the box at the bottom, the bedding will be kept in place and the lower draughts excluded. Neither straw nor hay makes suitable bedding material. Some layers of newspaper can be placed on the bottom of the box to break the hardness of the wood, and a piece of old blanket utilised as the actual bedding. An old pillow or not too coarse canvas bag can be filled with clean wood shavings, and if these are not too tightly packed, they make a cosy and comfortable bed.

Sanitary boxes or pans should be placed in an out-of-the-way corner, but always where the cat can get to them with ease. Well-broken peat moss or ashes from the ranges make the best sanitary earth. Sawdust alone is not to be recommended, as it sticks to the cat's paws and coat, is carried outside the box, and usually some is licked off the coat and swallowed. Sawdust mixed with the ashes makes a friable and absorbent material, but sawdust alone should be avoided. If the pans are

emptied and their contents renewed every day, they will never smell; apart from that, a cat will not use a dirty sanitary box, and it is the neglect of that necessary cleanliness which engenders bad habits.

As soon as it can leave the nest, even the tiniest kitten will seek instinctively for some earthy material, and if a shallow pan is placed close to the nest, and kept in the one place so that they know where to go, kittens will never give their owners any trouble in that respect. A pot or box of coarse grass should be grown, and with regular watering it will keep fresh indefinitely. Cats eat a lot of grass, as it acts as an internal cleansing agent, and is particularly necessary where long-haired cats are kept, as their swallowed fur is apt to gather in and stop up the intestines.

All cats indulge in claw sharpening, and for this purpose they should have a log or piece of rough wood into which they can stick their claws.

When house scraps do not suffice to feed the feline family, practically any of the proprietary dog foods can be requisitioned for the feline menu; that is, any of the broken-up or kibbled foods, and not the actual dog biscuits. Cod's head well boiled and sufficient of the liquid poured over it for the food to absorb without being sloppy, and then the flesh of the heads taken away from the bones and mixed up with the soaked food, make a nourishing and appetising meal. Or a sheep's pluck, namely the lights, liver, and heart, can be secured from the butcher, well boiled, the liquid poured over the food in the same manner as the cod's head liquid, and the flesh itself cut up and added. Rabbit is a size-making dietary, and horse-flesh is excellent, but the latter should be guaranteed pure.

Cow's milk is nearly always injurious to kittens because of the preservatives it contains, and for the same reason it disagrees with many adult cats. Both cats and kittens should be allowed abundance of clean water to drink.

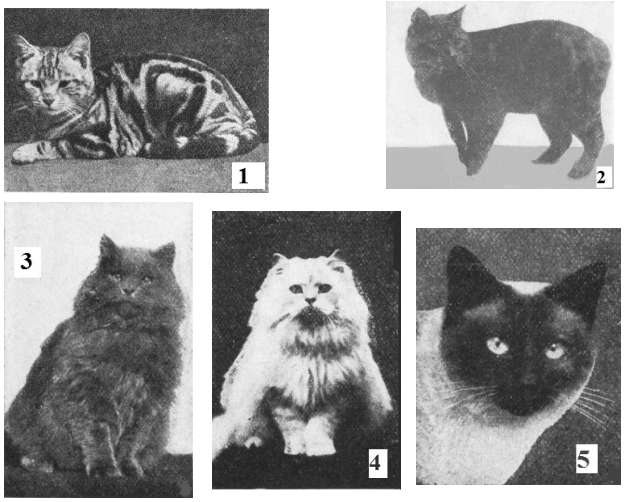
Varieties of Cats. Cats are classified in two main divisions—Persians, or longhairs as they are usually called, and shorthairs. The latter include the various British varieties as well as Manx, Siamese Abyssinians, and Russian Blues.

Blues are the most popular of all the feline tribe and the most remunerative for the average cat-lover. Any shade of blue is permissible, but soundness and evenness of colour are essential. There must be no dark patches, no tabby markings, and no white hairs. Blacks are jet-like cats, and the most difficult point is to get the colour a rich black to the roots of the coat. Blue and black kittens frequently have white hairs scattered over their bodies, and are often rusty or brownish in their top coats. These blemishes usually disappear with the kitten coats. Creams should be a rich cream or straw colour, the paler the better. Reds should be as rich orange or red as possible. All these varieties should have orange, amber, or hazel eyes. Some white cats have odd eyes: one blue and one orange, and these cats are quite good for breeding.

Chinchillas, which should have green eyes, should be one clear sparkling silver from nose to tail. Brown, red, and silver tabbies should have orange eyes. Browns and reds have respective ground colours of sable and orange, with markings of black and red respectively, while silver tabbies have a ground colour of silver with deep black markings. The word "tabby" is often interpreted as meaning a female cat, but what it really stands for is the marked or striped cats, as distinct from the patched ones, which latter are tortoiseshell and tortoiseshell and white. Tortoiseshells should have patches of red, cream, and black, the richer the colour and the more distinct the patches the better; while tortoise-and-whites are tortoiseshells with white, but the white must not predominate. Both varieties should have orange, amber, or hazel eyes.

The British shorthairs are self-blue black, white, red, and cream, though creams and reds are very seldom seen. There are also brown, red, and silver tabbies, and tortoise-shells and tortoise-and-whites. The British shorthair is built on finer lines than the Persian, and is not so cobby, the head is not so round, the nose is slightly longer. The coat should be close and smooth and never woolly. Russian Blues are sealskin-coated blue short-hairs, lankily or snakily built, with long, narrow heads and faces and green eyes. The real sealskin texture and pile of coat is their first essential; a woolly texture means a cross with a Persian. Manx are tailless cats, with very cobby bodies, long hind legs, a round rump, big head with well-developed cheeks, and a rabbit-like coat.

Colour or markings are of no importance in Manx. Abyssinians or bunny cats are found in two varieties: browns arid silvers. Siamese, or the royal cats of Siam, have pale cream-coloured bodies, with seal-brown faces, tails, and legs. Their eyes should be blue, and their coats have a woolly texture.

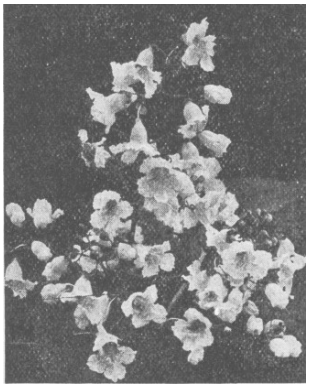


Cat. Specimens of the principal Fancy Breeds: 1. Silver Tabby Shorthair. 2. Red Tabby Manx. 3. Blue Persian, male. 4. Chinchilla Persian. 5. Royal Siamese.

Care of Persian Cats. Except that they require regular grooming if their coats are not to become matted and dishevelled, Persians are no more trouble to keep than are short-hairs. With the exception of the white variety being prepared for a show, washing is

never necessary. Groom persians with a long-bristled brush. White fuller's earth is the best cleanser for white or light-coloured cats. *(See also page 376)*

CATALPA. With its nearly heart-shaped leaves and clusters of summer flowers which are white marked with purple and yellow, catalpa bignonioides, or Indian bean, makes a charming lawn tree. It thrives well in town gardens. The yellow-leaved variety, aurea, is very attractive. Propagation is by seeds.



Catalpa. Flowers of this beautiful hardy tree.

CATARACT. Cataract is opacity of the lens of the eye, causing more or less blindness. It may develop from no apparent cause with the advance of age (senile cataract), usually after 50 or in diabetes, or may be due to accidental injury to the lens. Sometimes it is present from birth. *See* Eye.

CATARRH. Inflammation of a mucous membrane, e.g. the lining of the nose, the bladder or the gastro-intestinal tract. *See* Bronchitis; Cold; Conjunctivitis; Cough, etc.

CATERING: For the Home. In the country, with most perishable commodities, so to speak, at the door, catering resolves itself into carefully thought-out menus, taking due consideration of the days when it is possible to get fish, to make a change in the planning of courses from poultry, eggs, vegetables, etc., and keeping an eye on the store room, which should always be kept well stocked with tinned and bottled food in case of emergency.

The caterer for a small family in a town, buying such provisions as fruit, cakes, bacon, fish, etc., may be well advised to carry them away in the shopping basket, because booked orders are often not dealt with until late in the day. Moreover, unless top prices are paid for special reserve stocks, the finest market value has been carried off by careful housewives, and only the second best is left. Other advantages of personal catering are that it enables the buyer to see the particular bargains of the day, and to get better service by tactful praise or complaint.

Some people find it answers to plan a week's menus in advance. Friday is a good day to choose for this scheme, because of the extra week-end shopping that is necessary anyhow.

When giving a party, a few days beforehand plan and write down the menu; then, taking each course in turn, make a list of things with the quantities of each that will have to be bought. The special things can be chosen at the caterer's convenience, and each item ticked off on the list as it is purchased, so that nothing is forgotten. *See* Breakfast; Dinner; Luncheon.

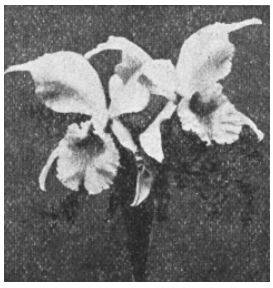
CATERPILLAR: In the Garden. Hand-picking of caterpillars, killing of butterflies and moths, crushing of eggs which are found in clusters on the underside of leaves, are the surest means of riddance. Syringing or spraying with soft soap and paraffin solution, in the proportion of one gallon of suds to a wine-glassful of paraffin, is a deterrent; but care must be taken to spray the underside of leaves to make it effective. Fruit trees should be grease-banded at the end of September, in order to trap wingless female moths, which crawl up the trunks and deposit eggs at the base of dormant buds, whence caterpillars come in the spring, attacking growth with disastrous results. *See* Butterfly; Cabbage, etc.

CATHARTIC. Any drug known as cathartic is used to open and clear the bowels, which is done by increasing the peristaltic movements of the intestines and by rendering their contents more liquid. *See* Aperient; Constipation.

CATHETER. This is a long, hollow instrument used to tap certain cavities of the body through narrow passages. One form is used to draw off fluid from the urinary bladder. Of various sizes, catheters may be rigid, made of metal, or semi-rigid, of a varnished woven network, or soft, made of soft rubber. Frequently on account of enlargement of the prostate gland elderly men have constantly to use catheters.

CATTLEYA. One of the chief groups of hothouse orchids consisting of some fifty species and innumerable hybrids; many have large and particularly handsome flowers.

The labiata group of about 20 species has a single broad ascending leaf, and the flowers are large, usually lilac or rose-purple with a richly coloured lip and some yellow in the throat. The hybrids far outnumber the species. Cattleyas are easily grown in a suitable house. Artificial heat is generally required, except perhaps in the height of summer.



Cattleya. Flowers of the popular hot-house orchid.

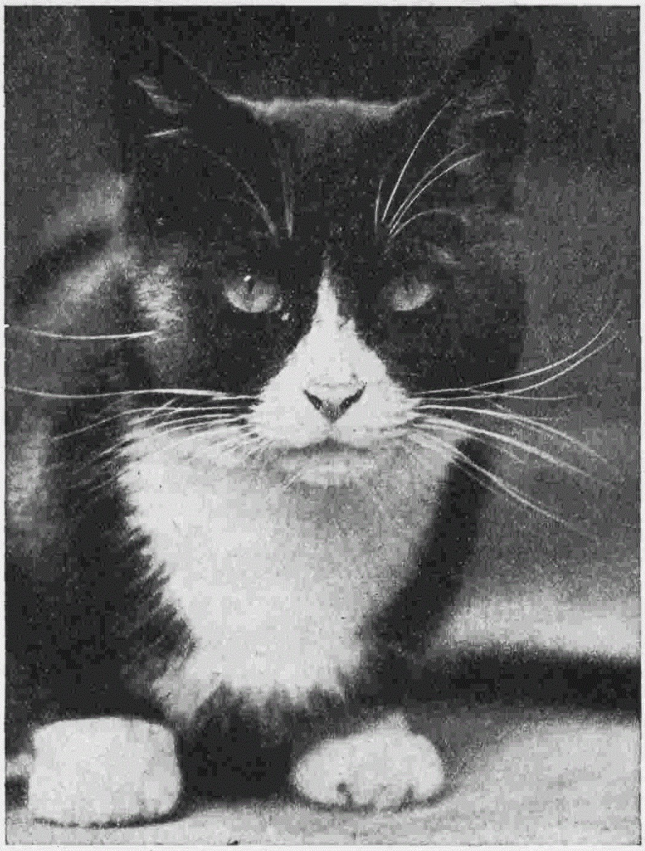
Cattleyas differ in their time of flowering, especially in the C. labiata group, some of which bloom immediately the young growths are completed, others after a short rest in the autumn, while the remainder wait until the following spring; a little more water should be given as soon as the buds begin to push in the sheaths. *See* Orchid Pron. Cat'-le-a.

CAUL. A caul may be bought separately, or a piece

(Continued in page 377)

CATS: THE MOST POPULAR BREEDS

Caught by the Camera in Various Moods



The ordinary household black-and-white cat becomes a creature of sinister beauty in this close-up camera study. Note his fur, rubbed over with a short-bristled brush followed by hand grooming, his long whiskers, and the texture of his white throat

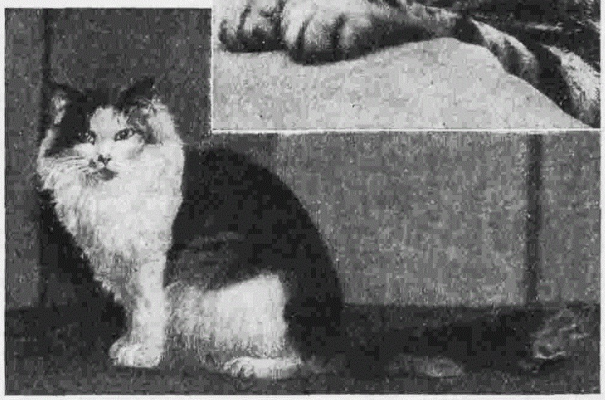
Photo, A. H. Roche

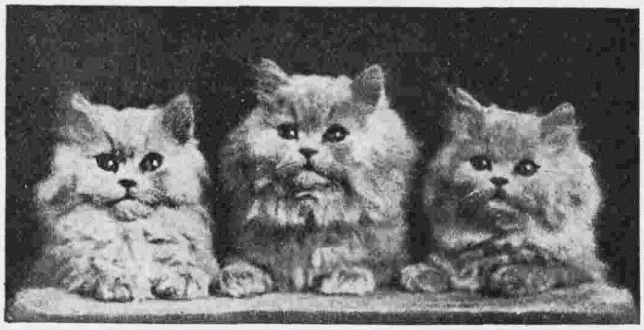




Here are two of the most familiar figures of the English fireside. Above: the long-haired brown tabby, leonine in appearance, with a thickish mane behind the ears. The ground colour is sable, the black occurs in stripes, and the eyes are orange. On the right: "Silver Penny," a prize silver short-haired tabby whose ground colour is silver. The black stripes are well defined, and the eyes are orange

Photos, Ralph Robinson; Topical.

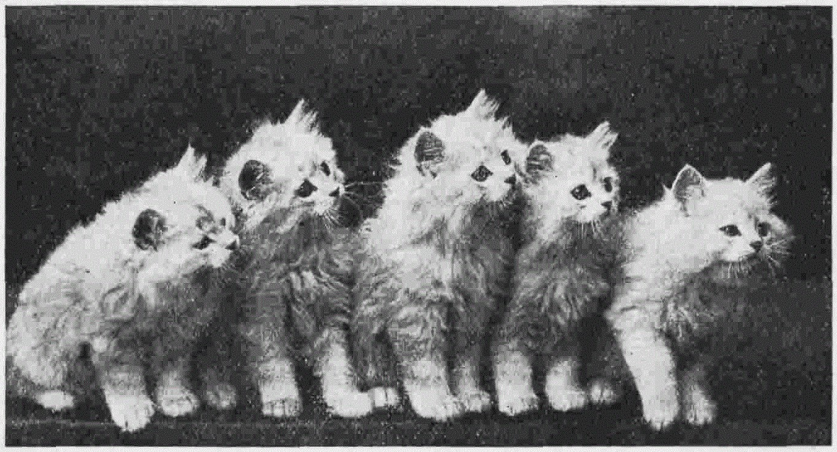




A trio of Blue Persian kittens; a very popular and remunerative variety. Right: a champion of the English tortoiseshell-and-white species—patches rich in colour, eyes between amber and hazel. Other examples of fancy breeds are given in page 205

Photos, Thomas Fall





Kittens are notoriously difficult to photograph, but here are two successful attempts. Left: a Persian kitten with blue markings. Right: a remarkable group of Chinchilla kittens, such restless sitters that they must be exhausted by play before a good photo can be taken. Their fur becomes a much purer white as they grow up

of it should be sent with a joint of lamb. Pieces of caul are used in which to wrap cutlets that have been spread with some farce or forcemeat before they are grilled or fried. Chopped mixtures of meat, game, etc., are wrapped up in pieces of caul previous to baking them. The caul forms a protection to the food, and by the melting of the fat, of which it is mainly composed, the meat is basted and kept moist.

CAULDRON. Originally made in wrought or cast iron, cauldrons now survive in the form of coal receptacles. These are stamped from sheet iron. A coat of dull black paint speedily restores their appearance if worn. *See* Coal Box.

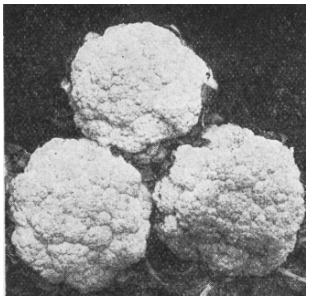
CAULIFLOWER. "What is the difference between cauliflower and broccoli"? is a question which is asked frequently. Both are varieties of the same species of wild plant (brassica oleracea), but broccoli is hardy, cauliflower is not. Cauliflower, which has whiter "heads" than broccoli, and is considered to be of finer flavour, is available only in the summer and early autumn, whereas broccoli is in season from autumn until late spring and early summer.

To provide the earliest crops in May and June, seeds are sown in a box of soil in August; the seedlings are potted, kept in a cold frame during the winter, andplanted on a sheltered border in March. The frame must be ventilated freely in mild weather and covered with mats in severe frost. It may be necessary to protect the plants occasionally with bracken or straw should severe weather set in after they are planted out of doors.

Suitable varieties for sowing in August are Best of All, Early Snowball, First Crop, Magnum Bonum and All the Year Round. A sowing of these varieties in a warm greenhouse in January, the seedlings being planted out in March-April, will provide a succession of produce.

The chief sowing is made on a prepared seed bed out of doors in April or in boxes of soil in a frame or greenhouse in March. Before they become crowded the seedlings must be trans planted to a reserve border in rows 8 in. apart. In June they will be large enough to plant out finally at about 24 in. apart. Good main crop varieties to sow in March-April are Autumn Queen, Autumn Giant, Early Giant and Walcheren.

Cauliflowers need deeply dug, rich soil to ensure free development, and watering is necessary in dry weather in summer. Any check to growth is likely to lead to indifferent results. They are not a success in poor, shallow soil.



Cauliflower. Three heads of the Walcheren variety with leaves cut as prepared for cooking.

The cauliflower is subject to attack by club root, gall-weevil, and the grub of the cabbage root-fly. In a blind plant no vestige of a heart appears, but in its place there is a small cluster of pale leaflings. Such plants are useless. A check to growth, perhaps due to drought, is the principal cause.

How to Cook. To prepare a cauliflower for boiling, after trimming off the leaves and stump, notch the stalk deeply so that a piece can be removed from its centre. Lay the cauliflower in a deep basin with cold, salted water and a dash of vinegar. This soaking is necessary to extract any caterpillars.

After the soaking, to prevent scum settling on the flower, place it head downwards in a saucepan of boiling salted water. Select a pan that is sufficiently small to keep it in position; if too large it usually turns over so that the flower is uppermost.

Care is needed not to over-boil this vegetable. Test the flower by finger pressure or with a skewer. Time for cooking depends on age and size. A small one may require only 15 min., a large one as much as 40 min. A fish slice is useful for raising and draining the cauliflower when cooked, then place it in a hot vegetable dish, straining over it plain melted butter sauce, or else serve it plain with a small lump of butter on top and a dust of seasoning.

Cauliflower au Gratin. Put a hot, boiled cauliflower on a hot au gratin dish or a pie dish. Squeeze the cauliflower gently together in a clean cloth with the hands, so as to press it into a neat shape. Melt 1 oz. butter in a saucepan, stir ½ oz. flour smoothly into it, add 1½ gills milk, and stir over the fire until the sauce boils and thickens. Add 1 oz. grated cheese, and pepper and salt to taste.

Pour this sauce all over the cauliflower, sprinkle 1 oz. more grated cheese over the top, and lastly a few browned crumbs, with a few bits of butter here and there. Put the dish in the oven until the cheese is nicely browned, then serve it at once This sauce will be sufficient for a small cauliflower.

The dish is as practicable made with the remains of a cold boiled cauliflower as with a fresh one. If the dish is required in a hurry, it can be browned under the grid. An alternative is to break the sprigs of cauliflower and place a layer to each layer of cheese sauce. Twice the quantity of the sauce is required for this method which makes a richer dish.

CAUSTIC. Caustics are substances which burn. Fuming nitric acid, glacial acetic acid, arsenic, nitrate of silver, carbonic snow, the electro cautery, and Pacquelin's cautery, a hollow metal point heated red-hot by benzine blown into it, are the chief caustics and cauteries used in medicine. Warts may be removed by nitric acid or glacial acetic acid, applied on the end of a match, otherwise the use of these agents should be left to the doctor.

CAUSTIC SODA. Being much stronger than ordinary washing soda, caustic soda is often used for

cleaning sinks, pots and pans, and for other domestic purposes. . It is a coarse white powder or in the form of pencils or sticks which become moist after keeping, and has a strong burning effect on the skin. For domestic use the proportion is 1 oz. in a pint of water.

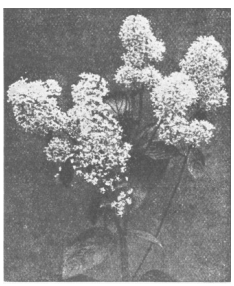
In cases of poisoning, large draughts of water should be given mixed with acids such as vinegar, citric acid, lemon-juice or tartaric acid; then give white of egg and olive oil.

CAVIARE. There are several kinds of caviare, which is a delicacy made from the salted roes of sturgeon and other fish of the same family. It should be eaten fresh, when it is a greenish-grey tint, succulent, and in shape like small pearls. Those who appreciate caviare eat it quite plain with crisp, dry toast and salt, cayenne, and perhaps a dash of lemon-juice. It is not suitable for hot savouries, and is best kept on ice till required. It should never be touched with metal, bone spoons or wooden skewers alone being permissible.

Caviare Prawn Croûtons. These are made by stamping out a dozen rounds of bread, each the size of a five-shilling piece and about ⅛ in. thick. Fry them a golden brown in 1 oz. of butter, and leave them until they are cold. Place a teaspoonful of caviare on each croûton, lay a shelled prawn on top, and use a few thin shreds of gherkin as a garnish. Arrange each croûton on a tiny plate, and serve one to each person.

CAYENNE. Cayenne is a red, pungent, intensely hot powder, sold and used as cayenne pepper. It is prepared from the fruit of several varieties of the capsicum. *See* Capsicum; Chilli; Chutney.

CEANOTHUS. The mountain sweet or Californian lilac is a group of leaf-losing and evergreen shrubs of great decorative value. Most of them need the shelter of a wall; a few are hardy enough to be planted in the open garden except in cold districts. The flowers of most of them are of some shade of blue. The chief favourites for the open garden are hybrids between Ceanothus americanus and Ceanothus azureus: there they grow from 2-4 feet high and flower in July-August. The best of them are Gloire de Versailles, blue, Ceres, rose, Indigo, dark blue, and Rose Perle, rose. They should be pruned in spring by shortening the shoots or branches of the previous year's growth.



Ceanothus. Flower clusters of the garden shrub.

Ceanothus veitchianus is a beautiful blue-flowered shrub, in full beauty in May, for planting against a sunny wall, where it will grow 10 feet or more high. Others suitable for a sunny wall are divaricatus, papillosus, and thyrsiflorus, all having blue flowers in April-May. When the flowers are over these wall shrubs ought to be pruned by shortening the side shoots of the previous year's growth to within a few buds of the base. They flourish in ordinary well-drained garden soil and are increased by cuttings set in a frame in July. Pron. Cē'-a-no'-thus.

CEDAR: The Tree. The cedar of Lebanon attains to a great age and size and forms a magnificent tree in time.

The Mount Atlas cedar forms a beautiful pyramid when planted with plenty of room to develop and with shelter while young. The foliage is less sombre than the cedar of Lebanon. The so-called blue cedar, atlantica glauca, is very handsome. The deodar cedar (oedrus deodara) is a most graceful tree for gardens. Cedars need plenty of room and thrive best in well drained loamy soil.

CEDAR: The Wood. Of the several varieties of cedar, the one grown in England is an ornamental tree the timber of which is seldom used, and is not of much value. The pencil cedar of N. America is the wood used for lead pencils. It is light reddish brown in colour, with a fragrant smell, and has close, straight grain, easy to work and easily split. W. Indian cedar is darker in colour, and has some resemblance to mahogany. The Himalayan cedar is a valuable timber tree in India.

Cigar boxes are made of cedar. It was formerly used a great deal for wardrobes, boxes and drawers, because moths and other insects dislike its smell and taste. It is used for some parts of pleasure boats; for, though soft and brittle, it is more durable than some woods when exposed to alternate wetness and dryness. The trunk of the cedar tree, owing to its low branches, decreases in diameter too rapidly to allow long planks to be cut from it. *See* Wood.

CEILINGS AND HOW TO REPAIR THEM

How the Amateur Worker can Make an Effective Job

Related articles include Cornice; Distemper; Moulding; Plastering. See also Adam Style; Drawing Room, etc.

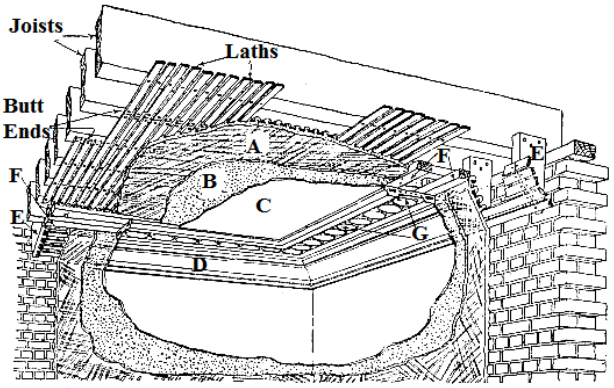
In England the plaster ceiling, as we know it, was developed in Elizabethan times. The patterns of these ceilings are often rich in design, the monotony of the surface being broken by the ornament of slight or heavy projections, often elaborated with pendants. Towards the end of the 17th century the character of the ceiling began to alter. The constructional beams were no longer hidden, but were used in combination with crossbeams and curvilinear ribs of equal heaviness to break up the surface into a series of recessed divisions or bays. Ornament was concentrated on and near these beams and ribs, and its character became bolder and more massive. This style was succeeded by a reversion to the flatter surface decorated in low relief.

Ceilings are a feature in houses built by the Adam brothers, and some of these have been taken down and removed. The brothers seized upon the flat style then

in vogue, and perfected it by substituting an intelligible classic design for the somewhat confused essays of their contemporaries. In these, panels are suggested only, with slight lines and rings of leaves and arabesque. The moulds of the ornamental devices of Robert Adam are preserved and used for many modern ceilings.

Apart from such ornament modern decorators use colour in ceilings; sometimes to tone with the walls when these are in pale colours, or with the frieze only when the walls are panelled; sometimes in contrast, as for example when a ceiling is stippled in golden yellows to enhance walls of plain colour with mouldings enriched with gold metallic paint.

The inner covering or roof of a room is generally finished in plaster work, or may be constructed of boards, 3-ply panelling, or building boards such as beaver board and the like. Plaster ceilings are built up on a groundwork of laths, the boards being nailed directly to the ceiling joists or rafters; but it is frequently better to employ special battens so as to utilise the boards to the best advantage. A good ceiling should be artistic in appearance, homogeneous and dustproof, preferably finished white or in some light colour.



Ceiling. Fig. 1. Diagram showing construction of a lath-and-plaster ceiling. A. Rendering coat. B. Floating coat. C. Setting coat. D. Cornice. E. Bracket. F. Ground. G. Ornamental work cast in pieces and fixed to F.

Lath-and-Plaster Ceilings. A lath-and-plaster ceiling is formed by nailing laths to the underside of the joists, as in Fig. 1, with a space of approximately ⅜ in. between one lath and the next to form a key for the plaster, which should be pushed up through the spaces and grip the edges of the laths. It is important to have straight-grained, well-seasoned laths in order to avoid breakage or rotting after fixing. Rent laths, shaped by cleavage of the wood, are better than sawn, since they contain more continuous fibres, and are, therefore, stronger. Usually, however, sawn laths are employed, and those known as "lath and a half"' in thickness should be obtained.

In commencing the work, some 10 or 12 laths, 4 ft. long, are nailed in position, then a similar number of 3 ft. laths, and so on. This is to prevent all the joints at the lath ends coming upon the same joist, as they would be more liable to tear away from their nails, and allow the ceiling to crack in a straight line from side to side of the room. In a new house the partitions running in the same direction as the joists are left incomplete wherever possible until the lathing has been carried from end to end of the building. By this means a great deal of lath cutting is avoided. Partitions running at right angles to the joists are built to the required height in the first instance, and are generally used as structural supports to the joist ends. The laths run parallel to these latter partitions, and do not have to be cut for them.

The Three Coats of Plaster

The plastering is applied to the ceiling in three coats, all composed of lime and sand, but mixed in different proportions. The lime is pure chalk lime, and is prepared by slaking lumps of quicklime in tubs containing excess of water, and then straining the liquid.

The first coat (Fig. 1, A), known as the scratch, pricking-up, or rendering coat, is made of coarse stuff composed of one part of lime with three parts of sand by measure, with 9 lb. of long, clean ox-hair to every cubic yard. In good work the floating, or second coat (B), is applied after the pricking-up coat is thoroughly dry, to avoid breaking the key of the mortar, i.e. the connexion between the mortar below the laths and that pricked up into the spaces between them. Floating and pricking-up are sometimes performed in one coat, but the attention devoted to obtaining a level surface (floating) detracts from the effort necessary in forming a good key by vigorous trowel work.

The third finishing, skim, or setting coat (Fig. 1, C), is of fine stuff composed of lime putty (q.v.) and washed sand in equal proportions, and is applied after the under coats have dried and settled into position. A setting coat of gauged stuff is sometimes used containing plaster of Paris mixed with the lime putty to hasten its setting properties. The proportions of lime-putty and plaster vary considerably at the discretion of the plasterer, but one part of plaster might be added to three of putty. No extra sand is added for the plaster of Paris, and in some cases the gauged stuff is left free of sand altogether, since plaster of Paris and other hard-setting gypsum plasters are not able to work with such large quantities of sand as lime mortar.

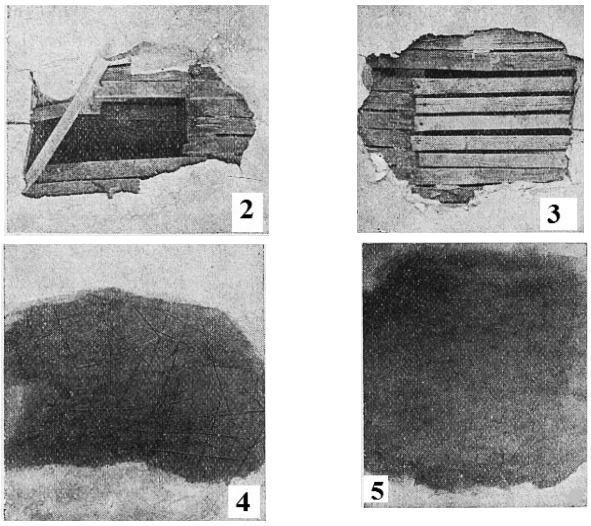
The employment of sheets, of asbestos compounds, compressed wood pulp or three-ply boards, beaver board, and the like, permits of ceilings being formed without the delay involved in waiting for plaster to set and dry out. The sheets are cut to the required sizes, and nailed at their edges to small wooden battens fixed in position at suitable distances on the underside of the floor joists. The exposed surface of the ceiling sheets is usually whitened or distempered, and the joints covered with slats of wood, arranged to form panelled patterns of ribs across the surface.

Ceilings in country houses are frequently made with the plaster in narrow strips between the floor joists in order to present an old fashioned appearance by contrasting the colour of the wood with that of the plaster. Small rough strips of wood are nailed to the sides of the joists to receive the ends of the laths, and after the plastering is complete small moulded strips

are sometimes fixed to the joists to cover the joint between the wood and the plaster.

Where plastering has to be applied to a broad wooden surface, special precautions have to be taken to ensure a key. In cheap work the beam is roughened with a great number of small gashes made with the corner of a broad chisel, an adze, or a hatchet, in such a manner that the chip is not detached, but is forced to stand out from the surface. As an alternative, broad-headed or clout nails are partly driven into the beam. If laths are used they must not be fixed direct to the face of the beam, but to rough battens nailed upon it in such a manner as will keep the back of the lathing from ¼ to ½ in. from the beam to allow room for the key of plaster which oozes round the lath.

Lathing should never be fixed direct to the underside of a boarded floor, but always to the joists, otherwise the spring of the flooring boards will crack the plaster. The laths must be supported at every 15 in. of their length, or the plaster will be apt to crack.



Ceiling. Figs. 2-5. Stages in mending a broken ceiling, the laths being repaired and covered with two coats of plaster, one rough and one fine.

Repairing a Ceiling. Among the tools which will be found of use in making or repairing a ceiling is the hawk, a wooden board about 12 in. square with a short handle projecting beneath it, used for holding a supply of material preparatory to depositing it on the ceiling with a trowel. The setting coat is applied with a wooden hand float, which works better if it is kept thoroughly clean and wet, free from lumps of dried plaster. The angle float is used for working in the corners between the wall and ceiling. A lath hammer is useful if much of this work is to be done, as by its aid the laths can be trimmed to length. The amateur will probably feel disposed to tackle the repair of an existing ceiling before launching out on new work. Fig. 2 shows a typical hole in a ceiling. Certain precautions are desirable, including the following. First break away all loose plaster around the damaged part. Then examine the lathing, and if any of it is broken, cut the laths out by chopping them off with a chisel, half-way across a joist, to provide a fixing for the laths which are to take their place. These can then be cut and fitted (Fig. 3). Next prepare the coarse stuff, and thoroughly brush away any dust and loose pieces of plaster, especially around the walls of the hole. Thoroughly damp the laths and the surrounding plaster work and then apply the coarse stuff with a trowel. The plaster has to be thrown at the laths rather than merely put up against them, the object being to force some of the coarse stuff through the spaces between the laths so that it can grip securely (Fig. 4).

The finishing coats (Fig. 5) are then applied. When applying the first force it up hard against the existing work and keep it damp for some hours by brushing it with water. When a moulded ceiling has broken away from the laths it can often be made good by strutting it up with uprights of wood, bearing upon boards placed on the ceiling, the whole driven up tight with wedges under the feet of the struts. Screws with large washers about 1 in. in diameter can then be driven into the joists about 10 in. apart. These will draw into the plaster work, and can be covered with plaster of Paris.

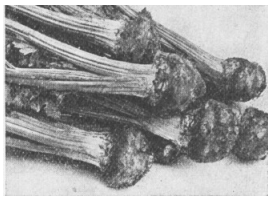
A better plan is to get up into the roof, brush off all loose and dirty material from the back of the ceiling and pour over it sufficient water to saturate the back of the ceiling. Then immediately apply a grouting of liquid plaster of Paris, pouring it all over the damaged parts. It will set very quickly and make a sound key to hold the ceiling in place. This method depends for success upon the complete removal of all dust and loose stuff from the ceiling. The strutting must not be moved until this plaster has thoroughly set, and is dry and hard.

Cracked ceilings are best repaired by scraping out the cracks with a chisel or scraper to enlarge the hole sufficiently to take the plaster or lime-putty which is used to make good. The edges of the cracks must be saturated with water to ensure a sound joint. Spots and dirty marks on ceilings can be removed with a weak solution of starch and water, painted on, allowed to dry, and afterwards rubbed briskly with a coarse flannel.

The embellishment of an existing or a new ceiling can be carried out with fibrous plaster ornaments obtainable ready-made, and only requiring to be secured in place with strong plaster. Cornices and mouldings are generally worked in plaster.

CELERIAC. Turnip-rooted celery, as it is sometimes called, finds less favour in Great Britain than in the other countries of Europe. The edible part is the enlarged base of the stem which is well shown in the illustration. The plants are raised from seeds sown in a heated glasshouse in February-March: the seedlings are treated as advised for celery and are planted 18 inches apart in June in rich soil. In August the roots are covered lightly with soil, and in early autumn they are lifted and stored in soil or sand until required.

To cook celeriac, wash and trim a root, put into boiling water and boil till tender, skin it, cut it into



slices and serve with white sauce.

Celeriac. stalks and roots of the turnip-rooted celery.

CELERY: FROM GARDEN TO KITCHEN

The Culture and Cooking of a Favourite Vegetable

This article contains also recipes for special celery dishes and information on celery pests. See further Fertiliser; Trenching

Celery stands almost alone among vegetables in being equally palatable either when cooked or in its natural condition. There are two types in common cultivation, the red and the white. Opinions differ, but the white has perhaps the advantage in being earlier, the red in vigour and flavour, so that it is customary to grow both. Good white varieties are Giant White, White Gem, and White Queen. Al, Superb Pink and Standard Bearer are some of the best red varieties. Early celery may be planted between rows of peas; late celery may follow early peas and broad beans. Those who want celery in August or September should sow in gentle bottom heat in February or put the pans or boxes on a shelf in a mildly heated house. A fine surface compost is desirable. A covering of half an inch will be ample. The seedlings must be transplanted at 3 inches apart in boxes filled with a mixture of loam and leaf-mould. When nicely rooted they are hardened off in a frame and planted out of doors in May.

Seeds to provide the main winter crop are sown in boxes of light soil in a slightly heated greenhouse or frame in March. When the seedlings are large enough they are planted in a bed of rich soil at 4 inches apart in a frame and from these are transferred to the open garden in June.

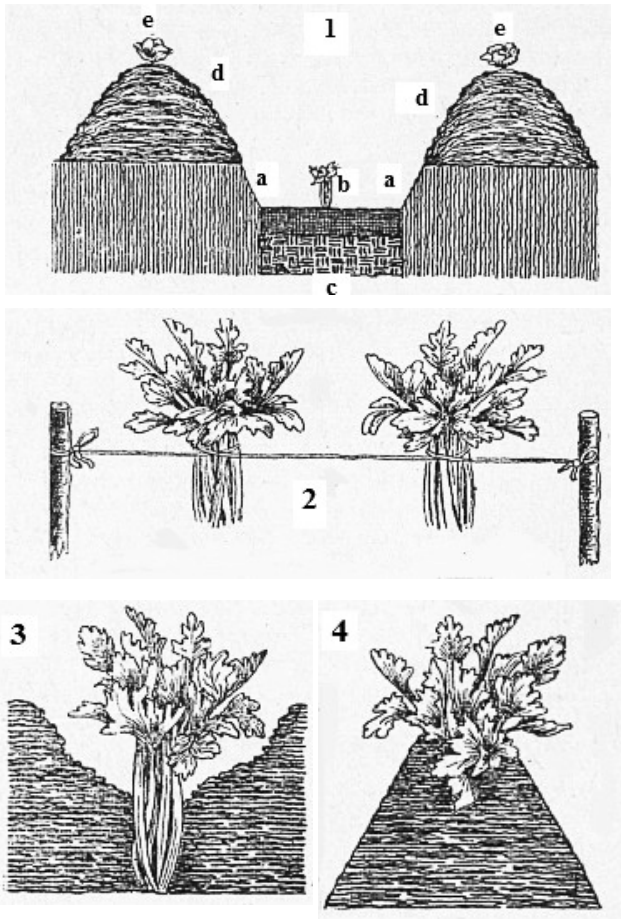
Trenching. Trenches are not essential, but they provide a convenient means both of feeding and blanching the plant. To prepare a trench, remove the top soil, break up the under soil, and liberally interlard it with decayed manure.

A trench for one row of celery may be not less than ½ a yard wide, and for two rows 2 ft. wide, the plants in this case being set in opposite vacancies. If the plants are grown in single rows in a series of trenches, the latter should be 4 ft. apart, and run north and south.

The depth of the trenches when finished should be 9 or 10 in., allowance being made for returning just enough of the top soil to cover the roots.

The Cuthill method of trenching, which has produced the finest celery in the world, consists in digging a trench two spades deep and 5 to 6 ft. wide, banking up the mould on either side. Fill in with a foot in depth of strong manure, such as decomposed cow dung, and cover it over with three or four inches of mould for planting in; or, if the ground is very rich, half the quantity of manure.

Fine celery, especially for early supplies, can be obtained without trenching, being merely planted in a slight hollow in rich, well-tilled soil. The blanching is mainly done with brown paper, or with special blanching bands, but a little earth is generally drawn up to the base. The trench system is better for winter celery.



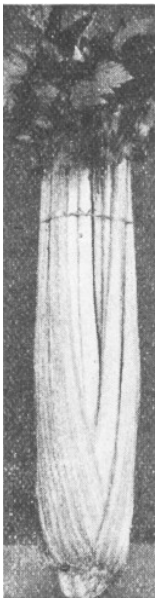
Celery. Diagrams illustrating method of culture. 1. Trench properly prepared; **a.** *sloping sides;* **b.** *good soil;* **c.** *manure;* **d.** *cast out soil, with catch crops growing at* **e.** *2. Good method of tying. 3. First earthing-up. 4. Final earthing-up.*

If there is plenty of ground available, the trenches may be made a month or so before planting, and as soon as the ridges have been formed at the sides of the trenches lettuces may be planted on them. As the celery grows, any sucker shoots that spring up should be picked put. The plants will grow the faster if water and liquid manure can be supplied.

When the plant is half-grown, 1 oz. of nitrate of soda in a gallon of water, ½ oz. phosphate of potash in a gallon of water, and ½ oz. each of superphosphate and nitrate of soda (or sulphate of ammonia) in a gallon of water, used alternately, will work wonders. Another good change is 2 oz. Peruvian guano per yard of trench, dusted on the soil in showery weather.

When the plants are a foot high, a loop of raffia may be slipped around them, and when they have grown another 6 in., a second added, fixing one near the bottom, and one, not very tightly, near the top; in this

case this should be done before the earthing, in order to keep the soil out of the centres. For earthing up, the soil should be just damp, not sodden or moist at the top and dry below, or running to seed may follow.



Head of Celery.

The earthing should be thorough, even though it is not completed in one operation. When several rows are grown in each trench, temporary divisions will have to be made with boards of the width of the trench while the earth is being packed among the plants. If there are slugs about, lime should be used freely. By the time earthing is completed—and that should be in advance of severe frost—the earth should be level with the topmost tip of leaf. Celery blanches in 6 or 7 weeks from time of being earthed.

How to Cook. Celery should be carefully washed, the outer stalks should be pulled off, and all the green tops, except the very young ones, cut away. When to be served raw, the head should be split lengthwise into four or more pieces, or every stalk separated, and served in a celery glass half full of cold water.

For cooking purposes, celery may be dried and stored. The sticks are cut in strips 1 in. long, left in a cool oven for a day or two until hard and crisp, then packed in airtight bottles, and when required for flavouring crushed to a powder with a rolling-pin. Celery seeds are also used for flavouring.



Celery. Successful method of blanch-ing celery grown on the ground level by wrapping the stalks in paper collars which exclude the sunlight.

To stew celery, the sticks are simmered in slightly salted water for about 45 min. They are then drained and served with white or brown sauce. Cooked celery is also good when dipped in batter and fried. Cardoon (q.v.) may be cooked in the same way.

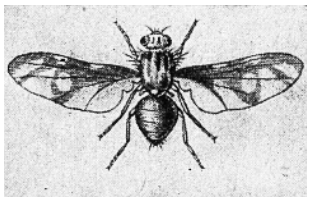
In order to make celery and macaroni stew, 1½ heads celery and 1 oz. macaroni should be boiled for 35 min. in separate pans each containing salted water. They are then drained and dropped piece by piece into 1 gill hot white sauce. A sprinkling of pepper and salt is added, and the whole allowed to simmer for 20 min. Prepared in this way, but cheese sauce substituted for white sauce, celery and macaroni, or celery alone, are also excellent au gratin. *(See* Cauliflower.)

Another good way of utilising celery is in a sauce for serving with boiled poultry. In this case wash and chop 2 small heads of celery, putting the pieces in a saucepan with sufficient cold water to cover them. Cook these slowly for a little less than ¾ hour, stirring frequently; then add some white sauce made from 1 oz. butter, 1½ oz. flour, 1 pint milk, and a little pepper and salt, and stir until the mixture boils.

To make celery soup with a large head, 2 pints of white stock or water and ½ pint of milk are required. The white part only should be used. Two rashers lean bacon, two onions, 1½ tablespoonfuls flour, 1 oz. margarine, with salt and pepper, are also needed.

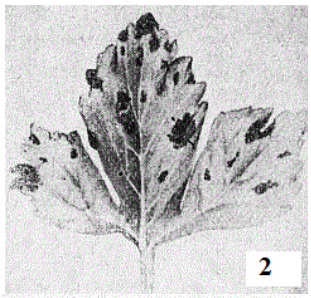
The bacon is cut into pieces 1 in. long, and the onion and celery sliced finely. The vegetables should then be fried in the margarine in a large saucepan. The bacon, stock, and seasoning are added, and the whole simmered for about 45 min. until the celery is tender. The contents of the pan should be rubbed through a fine sieve and the puree returned to the pan, the milk added, and the whole brought to the boil. The soup is then thickened by the addition of the flour, mixed to a paste with a little cold milk, and the whole cooked for about 5 min., stirring all the time.

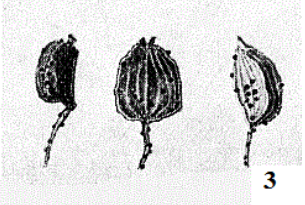
Celery Diseases. The most troublesome disease to which celery is liable is leaf spot or blight; one cause of the prevalence of this is bad seed. It is wise to buy seed of the best strain which has been treated in the way advised by the Ministry of Agriculture as a means of preventing leaf spot. If any doubt exists the seeds should be steeped for three hours in a solution of formalin, one part in 600 parts of water. Holding a leaf up to the light and looking through it enables the grower to recognize this disease which gives rise to dark spots on the leaves and may eventually render the plants useless. Spraying with Bordeaux mixture immediately diseased leaves are noticed is advised. If only a small number of plants is grown all the diseased parts should be cut off and burnt.



Celery Fly, the larva of which attacks the celery leaf; magnified.







Celery Leaf Spot or Blight: the chief celery disease. 1. Plant attacked by blight. 2. Effect on leaf. 3. Infected fruits.(By permission of H.M. Stationery Office and the Ministry of Agriculture)

The attacks of the celery fly usually begin in April and may last into December. The larvae live upon the juicy substance between the upper and lower skins of the leaf, which eventually shrivels up, with the result that the stalks and stems of the plant cannot grow and fill out properly. Parsnips suffer in the same way from these pests.

The best preventive measures are to spray the plants occasionally in late spring and early summer with paraffin emulsion for the purpose of keeping off the flies. Paraffin emulsion is made by dissolving a handful of soft soap in a little hot water, adding an eggcupful of paraffin and two gallons of water. Some good is done by cutting off those parts of the leaves attacked and burning them. It is most necessary that unused parts of diseased plants and those attacked by pests be not left lying about or thrown on the rubbish heap; they should be burnt.

CELL: In Electricity. This apparatus is used to generate a current of electricity by means of chemical decomposition. A simple cell is composed of two elements, a positive and a negative, immersed in a liquid known as the electrolyte. A single accumulator is also known as a cell. The so-called dry cell has the electrolyte in the form of a paste.

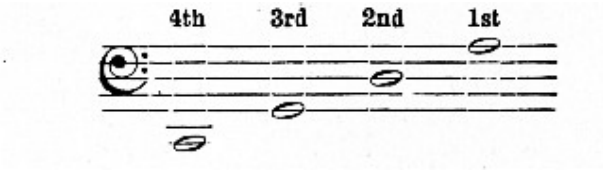
Cells are generally classed under two headings, viz., primary cells, which generate current, and storage cells or accumulators, *See* Accumulator; Battery; Daniell Cell.

CELLAR. The best situation for the cellar is on the north side of the house, and it should be partially or wholly underground if advantage is to be taken of the non-conducting properties of the earth in preserving the cellar from heat in summer. Houses built on soft soil may have cellars economically formed in the basement between the foundations of the walls. The maintenance of an equable and low temperature is important when a cellar is used for storing. *See* Coal Cellar; Wine Cellar.

CELLARETTE. Some sideboards have a drawer lined with zinc or other metal and divided into compartments, one for each bottle of wine, etc. Originally the cellarette was distinct from the sideboard, and was placed beneath it. Fine examples were made of rose wood and mahogany, some being oval or octagonal in shape. They were bound with brass bands and, in addition, had a receptacle for ice.

'CELLO: How to Play. The violoncello is the bass member of the violin family, and for orchestral purposes is usually supplemented by the double-bass, an octave lower. Its beautiful tone makes it a favourite instrument for amateur players, and a capable performer is always in request. In appearance it resembles the violin, but it is played from between the knees of the performer its lower end being supported on a stem sufficiently long to prevent the bow touching his body when either of the outer strings is played.

The four strings are tuned in perfect fifths, thus:



The strings are of gut, the two lowest being covered with silver or copper wire. They are played with a bow, which is drawn across them at right angles about an inch from the bridge. In piano playing it should be rather nearer the finger-board, but in the opposite direction in forte playing. For crescendo increase the speed and pressure of the stroke, the process being reversed for diminuendo. Besides the F and G clefs, the C clef, on the fourth line, is used as for the bassoon.

A start should be made by trying to produce a good, steady tone from the open strings. To this end it is necessary to pay chief attention to the use of the bow, which should be firmly grasped by the fingers, yet so as not to interfere with the freedom of the wrist. When a satisfactory tone has been acquired, the study of stopped notes follows, by practising different intervals, 2nds, 3rds, etc.

Owing to the length of the strings and the consequently wider distances to be reached by the fingers, the principle of the fingering differs from that on the violin. Broadly stated, it consists in the use of the next finger for a semitone and of the next finger but one for a whole tone, though this procedure is not invariable, especially in the higher positions, as will be seen by the exercises given in tutors for the instrument.

In order to reach the higher notes, the left hand is gradually shifted nearer the ribs of the 'cello. When the index finger is used to produce a second above the open note, the hand is in the first position; the second position is when it reaches a third above the open note, and so on. Thus on the A string the index finger will play B in the first position, and C, D, E, F, etc., in successively higher positions.

Sometimes a false nut is made by placing the thumb across two adjacent strings, and then fingering according to the method on the violin. This is useful for high notes; but players prefer the ordinary stopping, as the tone is stronger and more equal.

After use the 'cello should be wiped with a dry duster to remove any particles of resin from the belly, and it should be kept in its case, so as to preserve it from the dust, which otherwise will certainly find its way through the f holes, to the detriment of the instrument.

CELLULITIS. The term is used to describe a rapidly dangerous variety of inflammation of the soft tissues underlying the skin or lying between the muscles. The cause is always some pus-forming germ which either enters the tissue through a wound or is brought there in the blood stream, e.g. the microbe of erysipelas. It is more liable to affect debilitated persons, e.g. those suffering from diabetes or chronic kidney disease.

The first symptom is a rapid swelling of the whole part, with redness, tenderness, pain, and some fever. On pressing the finger against the skin a small pit or depression is formed which may remain for some moments after the pressure is removed. In the next stage the whole of the skin over the part involved becomes dark red, tense, and firm from the swelling of the tissues underneath.

The inflammation in cellulitis rapidly spreads, so that when beginning above the wrist, for example, within a day or two the whole arm may be hard, brawny, and greatly increased in size. Unless vigorous treatment is instituted the tissues under the skin become gangrenous, and the skin itself becomes purple or blackish, and then gives way. By this time the patient is usually in a very low state, with high fever, rapid, irregular pulse, and all the signs of severe constitutional disturbance. He should be under medical care at once.

CELLULOID. Largely used as an imitative substitute for ivory, celluloid is manufactured in rods and sheets, the latter more or less transparent. The material is elastic, readily machined and worked, takes a high polish and is capable of exhibiting very beautiful colourings; it frequently takes the place of tortoiseshell and other valuable materials. Celluloid is highly inflammable. The Celluloid and Cinematograph Act, 1922, deals with the storage of celluloid.

Celluloid can be turned in a lathe. Sheet celluloid can be moulded to any desired form by softening it in boiling water; it can be sawn with a fine tooth saw, or carved with chisels and gouges and generally treated by much the same methods as soft wood. For amateur purposes the solid rod and tubular celluloids in colours and the transparent sheet are most useful. The latter are sold in various thicknesses from a few thousandths of an inch upwards and about 50 in. by 20 in. in size. Ready prepared celluloid cement is obtainable from most electrical supply stores, and by its aid perfect joints can be made provided the two celluloid surfaces are perfectly clean.

Cellulose. Paints and Lacquers. *See* Enamel; Paints.

CEMENT: ITS VARIETIES AND USES

Methods of Use Clearly Explained for the Amateur

This article may be read in association with those on Brick; Bungalow; Cottage; House, etc.
See also Concrete; Lime; Mortar

Materials known in the building trades as cement include numerous varieties of lime and Portland cement. The former requires different treatment, and is dealt with separately, the following notes referring to Portland cement, which in appearance is a greyish-green material in the form of a fine powder. It should be perfectly even in grain and free from lumps, the presence of the latter indicating that the cement has got damp and has deteriorated.

Cement sets or goes hard by the action of water, a process known as hydration. It becomes harder and more durable in combination with certain other materials. Mixed with an equal or greater bulk of sand, the material is more practically useful, and is known as mortar. When the aggregate is in comparatively large pieces, such as broken brick or gravel, the resulting mixture is known as concrete.

It is vitally important for good work that the cement be uniformly distributed through the sand or aggregate, and that the water be uniformly applied and dispersed. While cement imperfectly mixed, is thus a source of danger, when properly handled it is one of the finest of building materials, and has great possibilities for the amateur constructor. It can be cast in moulds, or worked up with a trowel on existing brickwork or lathing; a whole house can be built with it, and all kinds of garden seats, rollers, sundial co1umns, orna-mental figures, etc., either cast or moulded while the cement is workable.

Cement can be purchased in small quantities at an ironmonger's, but it is more economical to purchase a sack of cement from a builder's merchant. This weighs about 2 cwt. Buy only the best and strongest quality manufactured to comply with British Standard Specification No. 12.

The amateur may begin by taking a handful of cement and gradually damping it with a little water, stirring the powder about so that the water is evenly distributed throughout. At first the cement will be crumbly; a little more water added to it causes the mass to hang together, and to retain its shape if moulded with the hand. Continue the experiment by adding a little more water to the cement and keep mixing it until the material feels slimy or greasy. This state is known as a fat cement, and is the best state in which to work it with a trowel. Now leave the material for a few minutes, and it will be found to have set. It will not be dry; indeed, it takes several days or even longer for the water to dry out. The point to notice is that the cement has undergone a chemical change, and setting has reached its maximum strength. The whole purpose of wetting is to bring this about, and the cement is then left to dry out. If it is knocked about with a trowel before it has dried and more water added, the material will mix up and look very much as it did before setting, but its real strength will have gone.

How to Mix Cement. The best way to mix a small quantity of cement is as follows. Provide a strong solid board or table about 4 ft. square upon which to mix the materials. The grading or proportioning of the materials is known as gauging: the gauging is done by bulk, or measure, and not by weight. Suppose the cement is wanted in the form of mortar. Take one pail ful of cement and empty it on one corner of the board. Then take a pailful of clean, well-sifted sand and spread it over the board with a trowel. Sprinkle about ⅓ of the cement over the sand, put another pailful of sand on the cement, and sprinkle another ⅓ of the cement over it. Finally, add the remaining sand, and

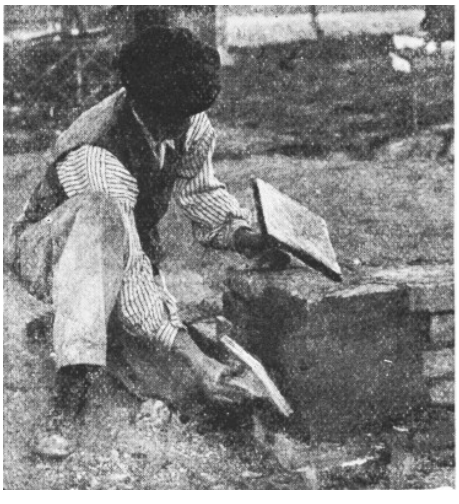
the rest of the cement. Turn it all over with a shovel, and rake it over until the grey colour of the cement is seen to be evenly mixed with the sand.

The complete mixing must be done dry, and a good result is obtained by using two mixing boards, shovelling from one into a sieve on the other, and sifting the mixture. When properly mixed, sprinkle with water from a watering can with a rosehead, and keep stirring until the whole mass is well mixed and in a workable condition. For casting in moulds use it moist; for bricklaying and rendering, or any trowel or moulding work, use it fat.

Cementing Large Areas. The application of cement to bricklaying is dealt with in the article Brick (q.v.). The repair of cracks in floors and walls, as well as the coating or facing of a wall with cement, known as rendering, is done generally as follows, using the mortar as described: For cement facings on brickwork, chip out all loose material, rake out the old mortar from the joints between the bricks with a chisel to a depth of ¼ inch, thoroughly wet the wall, and then smack on the cement by a sort of throwing action, so that it is forced hard on to the brickwork; and smooth it over with the trowel, and keep the cement damp for some hours by spraying it with a little water to avoid cracks due to a too rapid drying. Floors are dealt with after the same method.

A new floor laid in cement is generally composed of several inches of concrete and faced with a 1 in. thickness of granolithic cement, made by mixing cement, sand, and fine granite chippings in equal proportions. When dealing with large areas it is a convenience to break them up into sections by laying battens of wood on the concrete about 3 ft. apart and filling in between them with the cement facing, removing the battens and filling in the gaps as the work proceeds. Considerable skill is required to trowel up and float off a flat floor. A long, straight lath resting on the tops of two adjacent section battens, and worked about in different directions, will greatly aid this work by producing a level surface, only needing floating off.

Cement can be applied in the form of a wash to the surface of brickwork, old cement or plaster work. It consists of a mixture of equal parts of cement and sand, and is applied in a liquid form with an old whitewash brush.



Cement rendering on brickwork, showing how the hand float is used for applying evenly.

Casting and Moulding. The casting of cement is carried out in shaped wooden moulds; alternatively, those made of plaster of Paris can be used. The cement is rammed into the mould by hand in a damp condition, and the mould can be taken to pieces and removed from the casting as soon as the cement has set sufficiently. It should then be soaked with water and left to set hard and dry off. Very good results are obtained by using cement and sand in equal proportions. Moulding in cement is carried out more or less on the lines of clay modelling by shaping the material with sweeps or boards cut to a template, or by means of trowels of different shapes, and wooden or other modelling tools.

Keene's cement, made from alum and gypsum, is used in plastering (q.v.). It sets very hard and is useful for repairing damaged surfaces.

CEMENT: For Mending. For uniting the broken edges of china objects a cement such as the following is required: Soak 1 oz. of isinglass in 2 oz. of water overnight; then place the mass in an earthenware jampot; put this in a saucepan containing a small amount of water, and heat until the isinglass has dissolved. Next add 1 oz. of strong acetic acid, stir well, and pour the cement into small bottles.

For use, the bottle containing the cement is placed in hot water until the cement liquefies. The edges of the broken china object, having been warmed, are smeared with the cement, then brought together and kept in position until the cement has set.

For mending knife handles, mix together flowers of sulphur 1 oz., powdered resin 2 oz., kaolin 1 oz., and fill the hollow handle. Next heat the tang of the knife nearly to redness, and press it into the handle, holding it in position until it is cold.

For sticking leather patches on boots the following cement is used: Dissolve by continuous shaking gutta-percha raspings, 1 oz., in carbon bisulphide 5 oz. The surfaces of the leather patch and the boot are cleaned by means of fine sand-paper, the cement is spread upon the surfaces to be united and allowed to evaporate. Then the patch is placed in position and smoothed with a knife handle or rubbed with a warm iron. *See* Canada Balsam; Crockery, etc.

CENTIGRADE. This is one of the chief ways of measuring heat by a thermometer. On a centigrade thermometer freezing-point is marked 0 degrees and boiling-point 100. To convert centigrade degrees into Fahrenheit multiply by 9/5 and add 32. Thus 300 centigrade = 9/5 x 300 + 32 = 572° Fahrenheit. To convert Fahrenheit degrees into centigrade subtract 32 and multiply by 5/9. *See* Fahrenheit; Thermometer.

CENTIPEDE. Millipedes and centipedes are found in all parts of Great Britain. Millipedes are injurious in the garden, feeding on roots of all kinds, while centipedes are harmless to plants. Of the latter the variety mostly found in the garden is long and slender and is common in leaf-mould. *See* Millipede.

CENTRAL HEATING FOR THE HOME

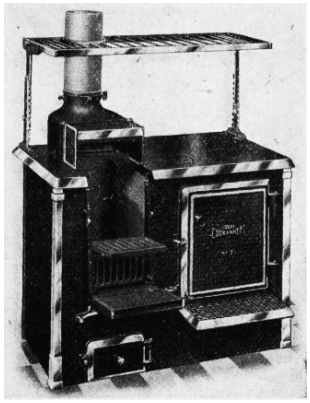
A Typical System and How it Operates

See Anthracite; Gas; also Boiler; Range, and other entries dealing with the heating apparatus of the house

The heating of a building by radiators or pipes supplied with hot water or steam from a single boiler is known as central heating. Several systems are in use. For domestic purposes the one- or two-pipe drop systems for low pressure hot water are probably the most satisfactory.

With a central heating installation only one fire requires attention, while a good boiler does not need stoking more than two or three times a day, and will remain alight all night. The heat transmitted by the radiators is healthy, mild, and agreeable, and there are no noxious fumes. The temperature can be regulated at will, and any individual radiator can be put out of action when not needed, or brought at once into service by merely turning a tap. The following notes refer to small domestic installations suitable for the average dwelling-house of six to ten rooms.

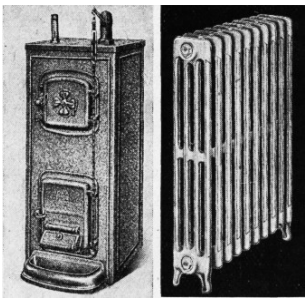
There are two distinct methods of low pressure hot water heating. The object of the first is to warm the whole house and to maintain it at an equable temperature. The second is designed for local heating; that is to say, the bulk of the heat is applied to the warming of one or two principal rooms, the others being warmed as required. Combination systems, where one fire suffices for cooking, hot water supply, and heating, are now available, and the type of kitchen range illustrated in Fig. 1 (the Ideal "Cookanheat") will serve several radiators in addition to providing domestic hot water and ample cooking facilities for the average dwelling-house.



Central Heating. Fig. 1. Combined boiler and cooking range, which also supplies bath water. (Courtesy of Ideal Boilers & Radiators, Ltd.,)

A central heating boiler may be heated by coal, coke, wood, oil, or gas. Anthracite and coke are the most satisfactory solid fuels. Central heating by gas-fired boilers may be found satisfactory from a cost point of view when consideration is given to the absence of fuel storage and handling, no dirt and no attention, as the boilers today are absolutely automatic. For small private houses the initial cost of the oil-burning plant is generally considered prohibitive, and in any case auxiliary power, such as electricity, compressed air or steam, is necessary for atomising the oil. The general magazine boilers and automatic stokers are to be recommended.

A typical boiler is illustrated below left. It consists of a number of sections, each providing complete waterways, connected at the top and bottom by nipples. The fire and ashpit are surrounded by a water-jacket. This boiler, usually supplied with an enclosing jacket and finished in vitreous enamel, functions as a radiator and will warm the kitchen or living room where it is situated.



Left, Fig. 2, independent "Neo-Classic" boiler for supplying a number of radiators. Right, Fig. 3, efficient type of radiator for central heating. (Courtesy of Ideal Boilers & Radiators, Ltd.,)

Dampers are provided to regulate the fire by controlling the entrance of air, the opening of the ashpit draught door increasing the heat of the fire, and vice versa.

The size of the boiler must be sufficient to maintain all the radiators constantly at full heat. When reckoning the size of an installation, allowance must be made for the geographical position of the house. A dwelling on a hill-top, exposed to the full force of a winter gale, obviouslyxe requires more heating than a building of identical size in a sheltered position. The area and position of the glass windows also play an important part, the loss by radiation through the glass windows being very considerable. Taking a fair average, the following sizes of radiators are required to maintain a temperature of about 65°. The figures represent sq. ft. of radiator surface:

	sq. ft.
Small bedrooms	12
Larger bedrooms	25
Passage way	10
Entrance hall	25
Dining room	50
Drawing room	50

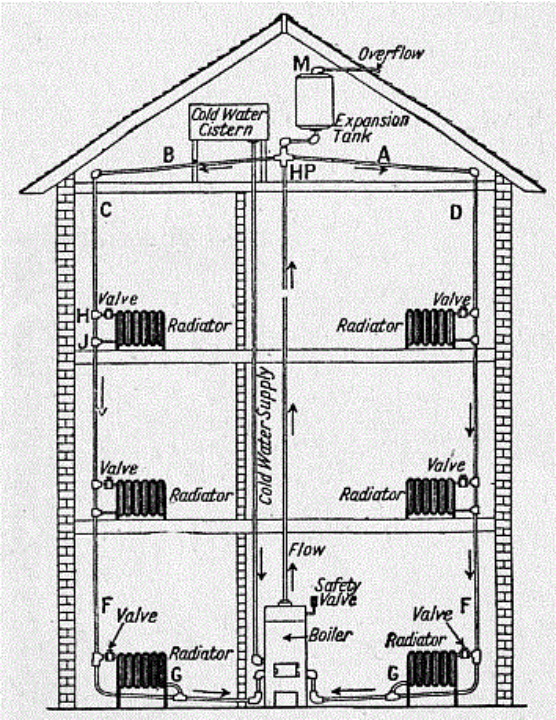
The total may be put roughly at 200 sq. ft. of radiator surface. To this must be added an amount to cover the losses in the connecting pipes, which can be greatly reduced by lagging the pipes wherever possible with asbestos or other non-conductor of heat. In an efficient system the heat employed exactly makes up the heat lost by the rooms. The above hypothetical installation would require a boiler containing about 10½ sq. ft. of heating surface, and measuring about 36 in. high, 14 in wide, and 28 in. deep.

Having decided upon the boiler, the radiators can be selected according to their capacity. The latest type of radiator has small fluted columns, as shown in Fig. 3. The smallest size may be a two-column 2⅝ in. wide or thereabouts, composed of 12 sections 24 in. high. The four-column pattern for larger bedrooms would measure about 30 in. high, and be composed of ten sections. For the largest rooms a six-column type can be chosen, having, say, eleven sections 36 in. high or 13

or 14 sections 30 in. high, according to the space available. A long, low radiator is sometimes more convenient than one of fewer sections but greater height.

Such radiators as those illustrated in Fig. 3 are made of cast iron, with the internal waterways formed when cast. The sections are connected by taper threaded internal nipples. Inlet and outlet connexions as well as a tapping for the air release valve are provided.

The pipe system has next to be planned. Desirable features are compact planning, minimum lengths of piping and gradual easy falls to all pipes. In the drop system (Fig. 4), the heated water ascends by the flow pipe to a cross-piece HP at the highest point of the system; branches are taken as at A B to the return pipes C D. The radiators are connected by short branches, as at H and J with a valve on the top inlet of the radiator. On the ground floor, when radiators are required on this level, they are connected by the down pipe F, then through pipe G. It will be seen that any of the radiators can be shut off by closing the valve, but without impeding the flow in the pipe. The pipe should be galvanised wrought iron, steam quality, or else of copper tube.



Central Heating. Fig. 4. Diagram showing low pressure hot water drop system. See text for lettering.

A smaller bore expansion pipe is connected to a small cast iron or galvanised expansion tank M, another pipe being taken from the top of the tank as an overflow on to the roof. A safety valve should, however, be fitted to the boiler and maintained in perfect working order.

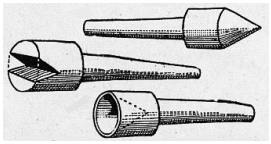
Connexions are made where necessary by means of the standard elbows, tees, and bends, screwed on tightly and the joints made water-tight with red lead or other jointing material. Various types of valves are available for controlling the supply of hot water to the radiators. The air release valves are simple plug-cocks and are screwed into the radiators.

The position of the boiler will be governed by convenience. Owing to the water-jacket, the risk of fire is very small; and in the majority of installations the boiler is placed on a tiled hearth. The need of carrying the smoke pipe either through the wall to the outside air or into a conveniently situated flue must not be lost sight of. Otherwise the boiler is best placed in the most convenient position in the house, whence the flow pipes can rise with as few bends as possible, consistent with an allowance for the expansion of the pipes when heated.

CENTRE. Centres are used on lathes and other tools to assist in supporting the work, and to locate it truly on the centre line of the shaft. The centre itself is in various forms; the point centre is pointed in shape, the cup or hollow centre is inverted, and the vee-centre has a V-shaped slot cut across at right-angles. Many small bench drilling machines are provided with such centres.

Centre to Centre. This expression is frequently found in descriptions of "how to make" articles. It means that measurements are taken from the centre line of one part to the centre line of the other part. It is the most accurate way of marking out a job. For example, floor joists may be specified as being 15 in. centres, meaning that their centre lines are 15 in. apart. Such joists are frequently 2 in. thick, but as they are only rough sawn, it would not be satisfactory to measure the gap between two joists, as this would vary slightly one from another, and the ultimate result would be unsatisfactory.

The word is also used in connexion with the making of chocolates. *See* Chocolate.



Centre. Implements used in lathe work; top, point centre; middle, vee centre; bottom cup centre.

CENTRE PUNCH. A centre punch is one having a sharp-pointed end, made of tool-steel either hexagonal or circular in section. It is used for marking the centre of a hole, for dotting a line on metal prior to cutting it, and sundry other similar jobs. It is used by holding it erect upon the work, with the point exactly on the centre. A sharp blow is then struck with a hammer on the head of the punch; this makes an indentation in the metal and thus marks the centre. The point should be kept sharp by grinding.



Centre Punch. How the tool is held and applied; above, types of centre punches.

An automatic centre punch has a spring-actuated self-contained hammer which strikes the blow when the punch is pressed hard on the work. They are very convenient in use. Bell centre punches are handy for marking the centre on the end of a metal bar. A centre punch or several of different sizes are essentials to almost everyone desirous of working in metal.

CERAMICS. Under this general name are included the plastic arts of the potter and the worker in clay fabrics. Thus the name includes chinaware (porcelain), faience, pottery (earthen and stone wares) and terracotta. Ornamental bricks and tiles are also branches of ceramic art. Owing to the fact that great potters experimented with many clay fabrics in making their wares, china marks are sometimes used on both earthenware and chinaware. *See* China; Faience; Pottery.

CEREAL. Foods made from cereals, i.e. from grains such as wheat, barley, oats, etc., provide the starchy substances which are necessary for life and health. Besides supplying starch, wheat flour and oatmeal furnish a fair amount of proteid or flesh-forming food, and oatmeal also contributes a substantial amount of fat as compared with the meagre quantity contained in other cereals. Mineral salts are also represented in cereal foods, chiefly in the form of phosphates of potassium and magnesium; but the amount of these in fine flour is small as compared with that in wholemeal flour.

Rice contains little else than starch, and what little of the other food constituents it does contain are generally removed by boiling it. The proper way to cook it is by thorough steaming. Oswego, corn flour and hominy are obtained from maize by acting on it with caustic potash. *See* Barley; Bread; Diet; Flour; Oatmeal; Rice, etc.

Cerebro-spinal Meningitis. This is the medical term for the disease better known as spotted fever (q.v.).

CEREUS. Several species of cereus bloom at night, hence its alternative name of torch thistle.

Among the best sorts is the rat-tail cactus (flagelliformis), so called owing to its slender wiry growth; it bears pink flowers in spring, and is a desirable plant for a hanging basket or for growing in a window. Fulgidus, with its scarlet flowers in early summer, is good for a small house. Grandiflorus bears large white flowers, often nearly a foot across, and is fragrant on summer nights.

These plants require a very porous soil, and it is usual to add shattered bricks to the loam when preparing a compost for them. The pots may be filled nearly one-third with crocks for drainage. In summer they should have a light, sunny position in the greenhouse or window; in winter they must be kept under glass safe from frost and given very little water. They are propagated by inserting portions of the matured leaves or stems in sandy soil in summer. *See* Cactus.

CERTIFICATE. Certain documents that are issued by public and other bodies, usually containing evidence about a person's status or proficiency, are known as certificates. Copies of certificates of births and marriages are required for various purposes, e.g. insurance. These are usually obtained where the birth is registered or the marriage celebrated; but if not they can be obtained from the Registrar General, Somerset House, London, W.C., or the Registrar General in Edinburgh.

As regards marriage certificates, copies can be obtained from the incumbent of the church in which the marriage was celebrated. Death certificates, signed by a medical man, are also issued and are necessary for burials and cremations, as they are for the proving of wills. Copies can be obtained for a small charge.

Certificates are given by various bodies, both those that examine in education generally, such as the joint board of Oxford and Cambridge, and bodies that specialise in one subject only, e.g. music. Certificates from medical men testifying to sound health are also required from applicants for various public and other positions. *See* Birth; Death; Marriage.

CESSPOOL. This is a receptacle for the sediment from a drain. Cesspools are of two kinds; those adapted for all kinds of drainage, and others intended for sink and bath wastes only. Many old houses in the country have nothing more than an open pond to deal with this class of sewage, but its presence is a menace to health and should be destroyed.

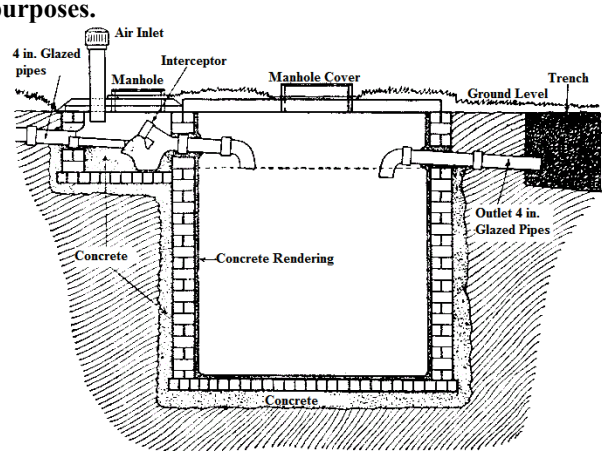
The drainage of the pond is generally accomplished by cutting trenches to conduct the water on to the land, previously filling in the trench with coke or gravel and covering with turf, if the land is pasture. The bottom of the pond should then be covered with unslaked lime, and a few days afterwards the sediment and soft material should be dug out, carted away and deposited in shallow heaps on the land as remote from dwelling-houses as possible.

The drains to the pool must be removed or stopped up with concrete, unless they are to be used for the new cesspool, in which case they must be tested before use. If the pond is to be used as such, the bottom should be cemented over, or covered with a layer of clay 6 in. thick, then a layer of straw, and finally another 6 in. layer of clay, well rammed and consolidated.

Points to observe in making a cesspool are to place it as remote from the dwelling as possible, never less than 70 feet, or any greater distance as prescribed by the local authorities, and equally remote from springs, wells or brook. The drain to the cesspool should fall gradually towards it. The outlet from the cesspool should fall as rapidly as possible, and discharge into an automatic distributor, or into trenches filled in with coke or gravel, and covered with turf.

The cesspool itself is preferably excavated to a depth of 6 or 8 ft. or more, the bottom made up with 6 in. of

concrete, the walls built of brickwork, filled in at the back with concrete, and rendered with a 1 in. thickness of strong cement mortar, gauged 1 of cement to 2 of sand. The top can be bricked over, or covered in with old railway sleepers and turfed over, leaving an opening large enough to admit a ladder and giving room for the ingress and exit of a man for cleaning purposes.



Cesspool. Sectional diagram showing the correct method of lining and connecting a cesspool for house drainage.

This opening should he covered with a cast iron manhole. To prevent any smell working back into the house, an interceptor trap and ventilating pipe must be built into a manhole formed between the drain and the cesspool. The outlet pipe from the cesspool should be 2 in. below the level of the inlet pipe, which should terminate in a downward direction by fixing a bend a little before the end. *S e e* Brick; Cement; Drain; Sanitation.

CHABLIS. A class of delicate, thin white wines, sometimes incorrectly described as white Burgundies, is known as Chablis.

This wine may be served with fish. A refreshing drink for hot weather is Chablis cup made from the following recipe: Dissolve 4 lumps of sugar in a ¼ pint of boiling water. Put this into a bowl with a slice of lemon-rind, and after about ½ an hour add a bottle of Chablis, a wineglassful of sherry and ½ pint water. Mix well, and after straining add a bottle of soda or seltzer water, a sprig of verbena, and a few strawberries. Ice and serve in small glasses. *See* Burgundy; Wine.

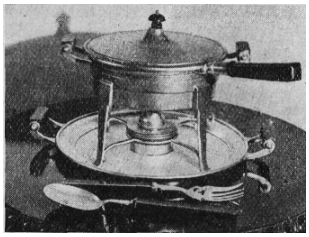
CHAFING. Wherever there is pressure on the skin, or where two skin surfaces rub against one another, chafing may occur. Wash the part several times a day with warm, soft water and soap, dry carefully by dabbing the part with a soft towel, and dust the skin with powdered talc.

Where excessive perspiration is the cause of chafing, this scented powder will be found agreeable:

Oil of rose geranium	5 drops
Salicylic acid	1 dram
Powdered zinc oleate	2½ oz.
Powdered starch	4 „

See Blister; Foot; Skin, etc.

CHAFING DISH: How to Use. A dish in which light cookery can be done at table is useful at breakfast or for late suppers. Chafing dishes are usually made of silver or electro-plate and possess an outer vessel to contain water, an inner pan with handle and a cover, stand, and a heating stove. The last named is often a spirit lamp, but electric chafing dishes are obtainable with a disk stove with two heats.



Chafing Dish. Modern example of a spirit lamp chafing dish. (Courtesy of Harrods, Ltd.,)

For frying and quick cooking, the inner pan of a chafing dish should he placed directly over the lamp; but when gentle heat is required, as, for instance, in the preparation of such dishes as scrambled eggs and stewed oysters, the hot-water pan should be placed beneath the cooking-pan. It is important that all utensils belonging to a chafing dish should be kept scrupulously clean, and the food served quite hot. When a spirit lamp is not in use, keep the cap on, otherwise the spirit will evaporate. A toaster is an invaluable adjunct to a chafing dish outfit. It is best to have all food to be cooked in the chafing dish prepared beforehand. Such food as sausages, fishcakes, rissoles, savoury haddock or kipper, can be ready cooked and reheated in a little butter or a suitably prepared sauce. *See* Savoury; Supper.

CHAIN: Its Home Uses. Chandelier chain is stamped from sheet brass by machinery and has many uses. Ladder chain is applicable to similar purposes, and can be used with small sprocket wheels for driving toy engines.

Jack chain is another machine-made form in brass, galvanised iron, or bright iron, and with single or double coils. It is useful for all kinds of light work.

Bicycle Chain. All the above chains are merely in the nature of a tether; but others are used to transmit power, like the bicycle chain, which consists of side plates or links, rollers and crossbars or rivets. There are several makes of such chains, of which the improved Renold is illustrated. This method of construction is applied to cycle and to motor cycle chains from ⅜ in. to ¾ in. pitch.



Chain. Component parts of improved Renold chain.

To obtain maximum life and service from these, or any other roller chain, they must be lubricated freely. If the machine has an oil-bath chain case, make sure that a sufficient oil level is maintained to bring the bottom side of the chain into the oil; otherwise remove

the chain about every three months, thoroughly clean it by immersing in a tray of paraffin, wipe dry, and then immerse it in melted chain lubricant, working the chain about to get the lubricant into the bearings. An important matter with a chain is to run it at the correct tension. It should not be run dead tight, but when the top side of the chain is tight, it should be possible to move the bottom side up and down about ¾ in. *See* Bicycle; Motor Cycle.

Chain. Measure of length. It is 22 yd. or 66 ft. in length and is divided into 100 links each of 7.92 in. Ten chains make a furlong.

CHAIN STITCH. In needlework there are three varieties of chain stitch—namely, machine stitch, embroidery, and crochet; all of these have the common purpose of linking together stitches that are comprised in the form of a chain. *See* Crochet; Embroidery; Sewing Machine.

CHAIRS: CHOOSING, MAKING AND MENDING

Advice for the Collector and the Craftsman

Related articles include Adam Style; Armchair; Chippendale; Dining Room; Drawing Room; Sheraton, etc. See also Baby Chair; Cabinet Making; Easy Chair

Most British households possess at least one chair, the Windsor, which expresses the development of this piece of furniture from stool to chair.

The two features which distinguish all Windsor chairs and are peculiar to them are the saddle-shaped seat and the fact that the back is structurally separate from the lower part. These two features are seen in no other chairs in the world. The Windsor is British and one of the very few pieces of furniture which is not a derivative from foreign sources. Old ones of undoubted authenticity can therefore be more easily obtained in England than anywhere else. Those made of yew are the best.

Old Windsors. A William and Mary Windsor has a crest rail with its upper profile bow-shaped. There is probably a crown in the middle. Some of the rails beneath the seat and the uprights of the back may be twisted or of barley sugar pattern. In a Queen Anne the centre splat of the back is probably fiddle-shaped and the legs cabriole. Later, this chair may show Prince of Wales's feathers. This type in varied forms appeared for quite 100 years. The arch back, which can be identified by its name, has horseshoe arms. The front stretcher beneath the seat is curved away towards the back legs.

Wheel back is a very common form, so called because the centre splat of the back contains a perforated shape resembling a wheel. It is probably derived from the well-known Hepplewhite feature. V-stretcher backs are so called because for extra strength two stretchers are put into the back of the chair in a V-shape, the point of which is formed by the stretchers meeting in a specially made tailpiece of the seat. The other ends of the two stretchers are fixed into the crest of the back.

The chairs of the 17th century, genuine specimens of which are rare, but have been widely copied, are those belonging to the periods of James I, Charles I, the Commonwealth and the Restoration. In this category may also be placed those of William and Mary, but they are not so distinctively English as are the earlier ones.

Chairs by the Great Makers. Chippendale chairs are so called because they are in the styles followed by Thomas Chippendale, mostly adaptations from the French of the period of Louis XV.

The average collector may take it that Chippendale chairs were usually made of mahogany, with a wide seat in front narrowing towards the back; they stand on legs square or mainly square in section, have a bow-shaped crest-rail, and a perforated, decorative convex back. Many so-called Chippendale chairs have cabriole or club legs, with ball and claw feet; it is doubtful whether Chippendale himself made many chairs with such legs. The decoration was by means of carving. Inlay was rarely used. The mahogany was heavy and of close grain. Ribbon back, Gothic and Chinese Chippendale chairs are among the styles which are specially valued by collectors.

Hepplewhite chairs are also principally made of mahogany, and the wheat-ear is a favourite form of carved decoration. Many are painted, and the typical specimens have either a shield or heart-shaped open back and show the wave-line, a serpentine curve in furniture. The front line of his chair-seats is often bow-shaped, and the arms are held by curved supports. Sheraton chairs have thin, tapering legs, angular backs, and are rather small as a rule in the seat. They are often of satinwood and the decoration painted or inlaid. The crest rails are straight, or nearly straight, with slight breaks. Late in life Sheraton was influenced by the Empire period.

The chairs designed by Robert and James Adam are not within reach of the ordinary collector. They are both carved and painted and genuine examples usually fetch very high prices.

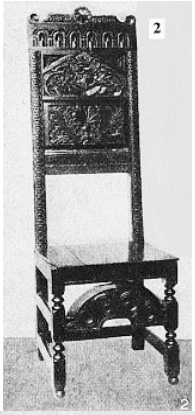
As chairs of any kind were not common in England before the reign of Charles II, it will be seen that numbers of so-called Jacobean chairs which are offered as antiques must of necessity be spurious.

The oak chairs of the time of James I have heavy framework, both legs and back being of timber square in section, and held together by rails simply mortised into the uprights. Panelled backs were common, and carved ornament had little or no modelling. Where chairs had arms they were simply scrolled, over supports which were continuations of the front legs, and were boldly turned.

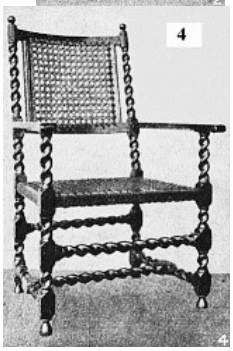
The art of the carver developed at the period of Charles I. Numbers of cushions were used for the seats of chairs which were hard and without curvature. X-chairs (that is with supports in the form of an X) were

seen in great houses at this period, and the art of the upholsterer was encouraged. Chairs of the Cromwellian period had very little ornament.









Chair. Antique examples. 1. Early English,17th cent. 2. Carved oak chair, 17th cent. 3. English carved and inlaid walnut chair, 18th cent. 4. Walnut armchair, 17th cent. (By permission of the Director of the Victoria & Albert Museum. S. Kensington)

The Restoration period has been more copied than any other of the 17th century. Typically, a Charles II chair will have a tall back with carved crest rail and twisted side supports, this twisted formation being also seen on the rails and legs. Cane panels were often used for the backs. In the time of William and Mary walnut was commonly used; and the twisted rails gave place to gracefully designed turning. A feature was the elaboration of the stretcher, one of the most important contributions to chair-making in this period.

Practically the whole Queen Anne period produced chairs in walnut wood. The stretcher work disappeared, the cabriole leg came in, and the knees were frequently carved with a shell. Backs were still high, and there was a concave centre splat resembling a fiddle in shape in the back. Many chairs of this period were upholstered. They were often inlaid as well as carved, and the ball and claw foot was first seen about the end of this reign.

Making a Chair. A change for the ordinary Windsor chair is that shown in Fig. 1. White deal could be used for a cheap variety.

The main dimensions are 18 in. from the floor to the seat, and 3 ft. 2 in. to the top of the back. In plan, the seat should be 1 ft. 2 in. at the back, increasing to 1 ft. 5 in. at the front and 1 ft. 3 in. from back to front. The rake of the back should be similar to that in Fig. 16 in the drawing room series, except that the lower portion is not curved, and does not diminish its thickness: the legs should finish 1½ in.

The front legs should also be 1½ in. square, and can be bevelled at the inner edge. All the joints are tenoned except those of the bottom rail, which are dovetailed into the side rails, The seat rails should be of 1 in. material 2 in. wide, and the horizontal back rails the same thickness, 1½ in. wide. The panel and slats are ½ in. thick, the panel being 4 in. wide and the slats 1¼ in. The seat should project slightly, and is screwed from underneath. It is cut away to fit round the back legs.

A Bedroom Chair. The design at Fig. 2 works out well in mahogany, and some extra interest is given to the panel by quartering up and shaping it. This chair would also look well in English walnut, whilst a good result is also possible in waxed oak. The chair (Figs. 2 and 3) has a total height of 2 ft. 11 in., height of back being 1 ft. 6 in., and of seat (at back) 1 ft. 5 in., the front of seat being ½ in. higher. Width of back at top is 1 ft. 2½ in., diminishing to 1 ft. 1½ in. at seat, depth (back to front) of seat being 1 ft. 1½ in.

In setting out the back legs the most economical method is to mark them out close together on a narrow board of a sufficient thickness to allow of cleaning up to the following detail dimensions. Total length finished 2 ft. 8¾ in. to joint of top rail, an additional 1 in. being allowed for the tenon here. The face should finish 1 in. in width throughout the back leg. but the thickness will vary between 1¼ in. net at the seat height and 1 in. net at ground. The upper portion of back leg can be lessened to 7/8 in. thickness with D section. The rake at seat height is 2¼ in.

The top back rail has broken corners, and in style will go well with furniture of Queen Anne or Chippendale character. This piece finishes 2¼ in. wide net, and should be carefully shaped to the outline indicated. In setting out, the best way will be to allow ½ in. radius for the quadrant internal breaks, and strike the parallel outer shapings at 1½ in. radius. The rail may be flat, but in practically all chairs of similar type the effect is improved by working to a curve, which in this case could be ½ in. spring (i.e. depth) only. The lower edge of rail will require mortising or grooving ¼ in. or so deep to receive the back panel or splat, the finishing thickness being 7/8 in. net. The lower rail of back is fitted 1 ft. 1 in. clear of top rail and, if curved, should correspond with the latter in depth, finishing size being a clean up from 1 in. by 1 in. and should be tenoned into position.

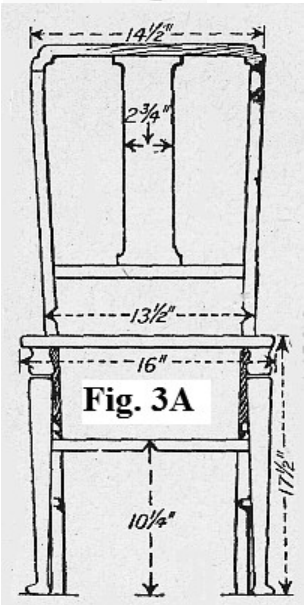
The back panel can be of ⅜ in. thickness, or slightly less, and is 3½ in. wide, shaped back to about 2½ in., an extra ½ in. full being allowed in length for stubs top and bottom. The quartered effect indicated at Fig. 4 is well worth carrying out in veneer, and is not difficult to lay if the meeting edges are cleanly cut with the grain to match up nicely. A front elevation and side view of this chair are given at Fig. 3. The back, it will be noticed, tapers slightly towards the seat, and can be 1 ft. 2 in. to 1 ft. 2½ in. at top over all, narrowing to 1 ft. 1 in. or 1 ft. 1½ in. below. An enlarged set-out of the

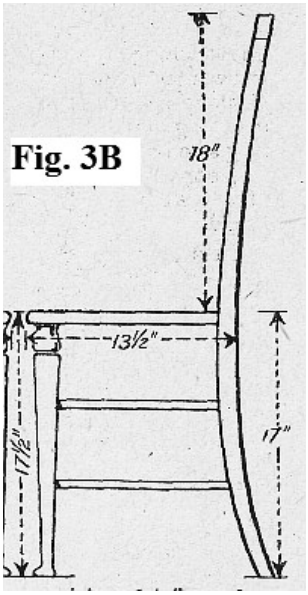
back mapped in 1 in. squares is shown at Fig. 4. The seat is framed up of pieces 1½ in. wide by ¾ in. net, usually dowelled together, and is fixed to the back legs by notching and by a hardwood peg right through. The back rail of seat is often allowed a trifle extra width and is shaped. The seat is caned in the ordinary way. The legs can be worked from lengths of 1½ in. material to finish 1⅜ in. at top, tapering to ¾ in., below which the swell for toe can be 1¼ in. by ⅞ in. high, this latter projecting slightly more at front than at back of legs. A front rail between legs can be fitted at a height of 10¼ in. from ground.



Chair. Fig. 1. Simple kitchen chair. Figs. 2-3. Bedroom chair, with diagrams giving details and measurements for making.







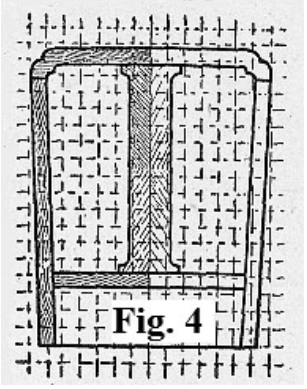


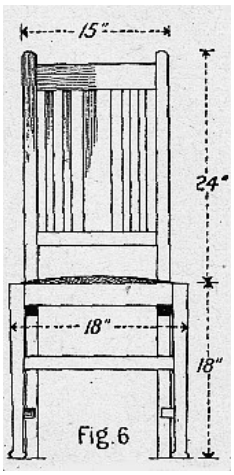
Fig. 4. Showing how the back of the bedroom chair may be shaped and sized.

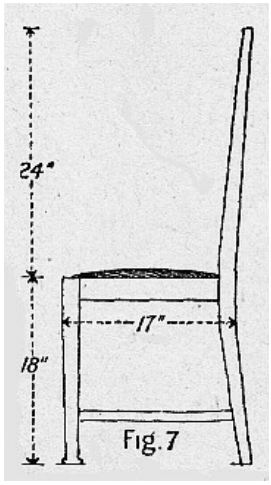
A Dining Room Chair. Fig. 5 shows a serviceable and graceful type of chair for dining-room purposes. Oak is most suitable, but both beech and birch are serviceable if well stained so that they do not quickly wear white. Choose only the pick of well-seasoned wood, fairly straight and regular in grain, and free from knots, shakes, and bruises that would tend to weaken its resistance to a strain that is often considerable. The general height for a standard chair-seat is fixed conveniently at 1 ft. 6 in., but is often found to be 1 ft. 5½ in. to top of front rail, after levelling and a loose-pad seat, such as that shown at Fig. 12, if well stuffed, will add a trifle to this. Should it be desired to provide a stuffed or spring seat, the seat rail will need to be lower in order to allow for moulding up.



Fig. 5. Example of single chair belonging to dining room suite.

For the standard or small chair the width across the front is a full 1 ft. 6 in., and across the back it is from 1 ft. 2½ in. to 1 ft. 3 in. The depth of seat, front to back over rails, is 1 ft. 5 in. for the person of average height, but in special cases for a tall person a depth of 1 ft. 6 in. to 1 ft. 7 in. will be found more comfortable. A fairly high back is shown, height from seat rail to top of capping on back legs being 1 ft. 11 in., the top back rail entering the back legs 1 in. lower at a height of 1 ft. 10 in. The back may be made 2 in. lower without detriment to proportion. Width at top of back over uprights or back legs is the same as at at ground level, 1 ft. 2½ in. to 1 ft. 3 in. Where armchairs are provided they are often termed carving chairs, and at times the seat is increased in height to 1 ft. 7 in. The width across front of seat is a full 1 ft. 9½ in., and at back is 1 ft. 5½ in. Depth, back to front over rails, should be the same as for standard chair. The height of back can be 2 in. in excess of that of the standard chair; width of back is uniform.





Figs. 6, 7. Front and side elevations of dining room chair.

The standard chair is shown in elevation (front and sides) at Figs. 6 and 7, with main dimensions marked. These will be of assistance in making a full-size set-out on lining paper which in all cases should be done, and to facilitate which a pencilled extract of following sizes will save constant reference to letterpress, The back is shown to enlarged scale at Fig. 9, The back legs (A) finish 1¼ in. wide on face throughout, and thickness at seat height is 1⅝ in., which is tapered to 1 in. net at top

and at ground respectively.

The method of setting out this part of the work is shown at Fig. 8, A, plotted out in 1 in. divisions of width and 2 in. divisions of height, the height of seat rail being noted at 1 ft. 6 in., where the rake or depth of curve is 1¾ in., measuring from a line touching top and bottom of back leg. Some economy of wood can be effected by setting out legs close together on the same board.

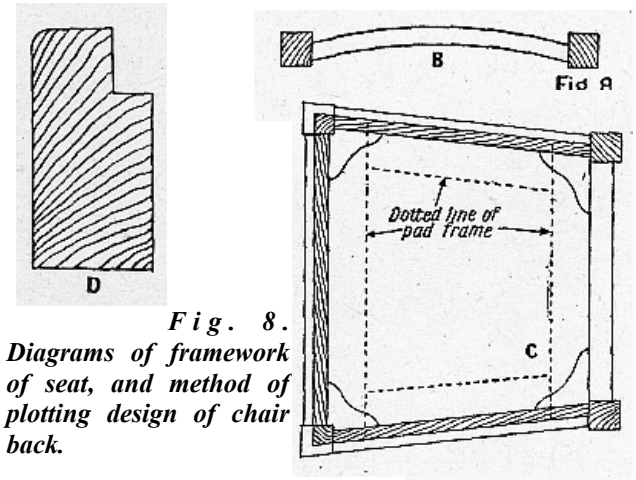
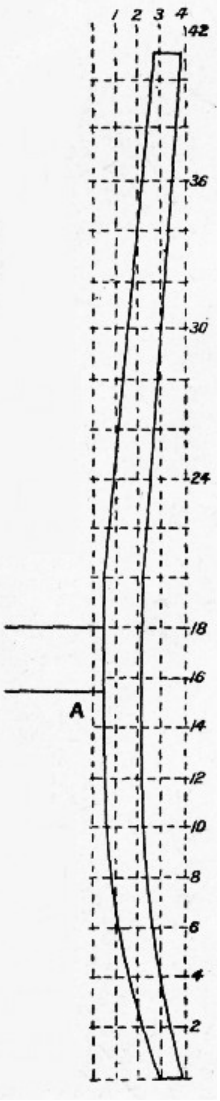


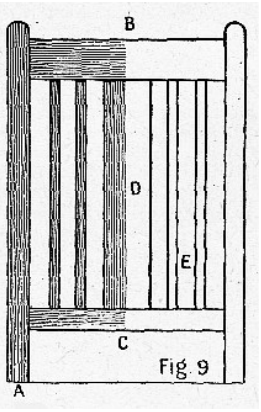
Fig. 8. Diagrams of framework of seat, and method of plotting design of chair back.

The top back rail (B) takes a piece 1 ft. 3 in. by 3½ in. including tenons and paring, and when finished will measure 3 in. wide. The lower rail (C), 1⅜ in. wide, finishes like the top rail ⅞ in. thick. Both rails can be flat, but the general appearance and comfort to back will be improved by working the rails to a curve in the manner indicated at Fig. 8, B, out of thicker material. The centre panel (D, Fig. 9) can be 2½ in. to 3 in. by ⅝ in. thick, stubbed into rails top and bottom, taking a length of 1 ft. 3 in. including joints. The narrow bars or uprights (E) on each side of panel finish ¾ in. by ⅝ in. thick. By way of embellishment, three flutes can be worked on the back legs, and two scratched beads on the bars close to the edge will improve them. Height of rail (C) above seat-rail is a full 3 in.



The seat-frame rails, shown enlarged on plan at Fig. 8, C, finish 2¼ in. by 1⅛ to 1⅜ in. thick, and will require careful tenoning into back and front legs. The joint is cut in line with the rails, and entered so as to give as long a tenon as possible, mitred to meet. A section of front and side rails is given at Fig. 8, D, showing a ⅜ in. rebate for seat-frame ⅞ in. or ⅝ in. deep with the outer edge rounded. The front legs should not be less than 1½ in. by 1½ in. and might finish ⅛ in. larger for a firm chair. They are shown as tapered with the lower 1⅛ in. shaped to form a toe as a relief from plainness. In framing up it will be noticed that the back legs are joined square with the back rail, whilst the front legs finish at sides in line with the side rails of seat, but not quite flush with them—say ⅛ in. projection with the projection rounded away at edge.

Fig. 9. Back of chair.



Supports for the Movable Seat

The interior angles of seat are stiffened by the fixing of braces cut out in 1 in. material 3 in. by 3 in. to shape, and screwed into position flush with the bottom of rebate so that they give extra support to the pad frame.

An improved finish to the seat-frame is secured by moulding the top edges ovolo at front and sides. The back seat rail is not rebated.

The pad-seat is upholstered on a separate frame, and is indicated by dotted line on plan, Fig. 8, C. This frame should be preferably of birch dowelled together or bridled and screwed, and is made a full ⅛ in. smaller than the rebated opening to receive it, as an allowance for the covering material. Thickness of material should be that of the depth of rebate, and where the front legs project on the inner angles the pad-frame is notched at corners to fit. Upholstery of pad-frame could be carried out in hide, but a change would be velvet or mohair. Tapestry may also be used.

The underframing shows three rails, one high up connecting the two front legs, and one rail to connect each pair of front and back legs. The arrangement stiffens the chair considerably, and with the front rail as shown, has the advantage over the ordinary H-pattern framing of not tempting the sitter to put his foot upon it. No rail is necessary between the back legs, but it can be added if desired. Size for the rails may be about 1½ in. by ⅝ in., or the front one may be wider, say 1⅜ in.

Drawing Room Chairs. Since drawing room chairs are lighter in construction than dining room and other types, it is essential if the chair is to last any time that all the material should be sound and of good quality and that the maximum amount of strength be obtained by good workmanship and careful planning of the joints, etc. The best plan is to make a full-size drawing of the chair, giving side and front views and a plan of the seat (Figs. 11,12,16 and 18). The setting-out of the back legs requires careful attention to get the correct rake (notice that a straight, perpen-dicular portion is always left where the side seat rails join them).

The method to mark out the back on the wood is as follows: Prepare the wood the total length and thickness required, and wide enough to take the rake, and square up the front edge. At this edge mark the position of the straight portion required for the seat rail joint (the edge being already square and straight) and mark the remainder of the leg and back from this point. The chairs should be finished with french polish.

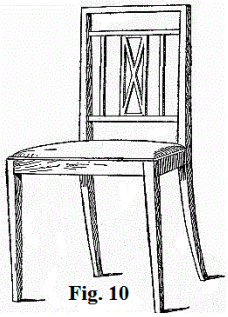


Fig. 10

Chair. Fig. 10. Light drawing room chair.

Fig. 10 is a light chair to be made in mahogany with a loose seat (Fig. 12). This style would do equally well for any living room, the upholstery being varied accordingly. The main dimensions can be scaled out from Fig. 11, using the 3 in. squares as a scale (thus the height of the back is 3 ft., and two pieces 4 in. wide will be required from which to cut the back legs). At their widest part on the front side these should measure 1⅜ in., tapering downwards to 15/16 in., and upwards to ⅞ in.

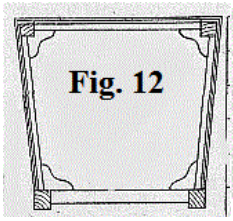


Fig. 12

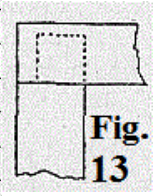
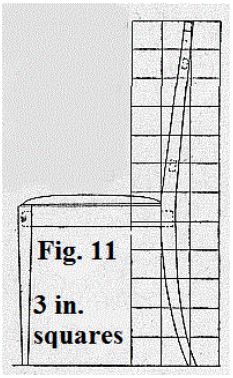


Fig. 13



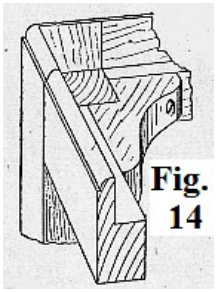


Fig. 14

Figs. 11-14. Showing details of joints, back, and seat.

The front legs at the top are 1⅜ in. and taper to ⅞ in. Note that these are bevelled away to line up with the side rails, which are necessarily at an angle caused by the front of the chair being wider than the back. The front and two side rails are rebated ⅞ in. on the inner edge to take the loose seat and a moulding is worked on the edge (see Fig. 14). The rebate is continued on the leg and the moulding worked on it after the chair is glued together. All the rails are tenoned into the legs and the joints strengthened with angle brackets (Fig. 12). The top rail of the back is mortised to take the uprights (Fig. 13) and the intermediate rails stub-tenoned.

The centre back portion is cut from a piece of ½ in. material, the triangular shapes being cut out. When glueing the chair up, glue the back and front first and allow to set before fixing the side rails. The loose seat can be made from any of the cheaper hardwoods and is either halved or mortised together. An allowance of ⅛ in. should be left all round to allow for the thickness of the material with which it is covered.

For a drawing room this type of chair looks well covered in striped material—either self-striped satin, or a vari-coloured taffeta. Brocade or damask is suitable, or a loose cover can be easily made to match those of other chairs, etc., in any living room. Rep is suitable for a dining room chair of this make, or any good fabric with a geometrical design. Damask may also be used if the other furniture in the dining room is of the light character with which this chair would be a good choice.

Mahogany Chair with Stuffed Seat

Fig. 15 is a chair of similar character but having a stuff over seat and an under framing. It is set out and proceeded with similar to Fig. 10. A wide and shallow rebate is worked on the rails over which the material is tacked (Fig. 17). The front legs are easily rebated after glueing up. The lower side rails are of ½ in. material and are ¾ in. wide, they are tenoned into the legs. Note that the shoulders of both joints will be at an angle. The joining rail is dovetailed into the side rails. When preparing the top back rail, which is dowelled into the uprights, the dowel holes should be bored before cutting the rounded portion, as it would otherwise be liable to split away (Fig. 19). Half-inch beech dowel is the best to use. The slats are stub-tenoned between the two rails, and are ¾ in. wide at the top and taper to about ½ in. Use ½ in. material for these.

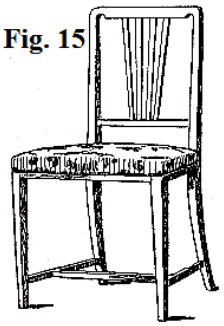


Fig. 15

Chair. Figs. 15-19. Another pattern of a mahogany drawing room chair, with working diagrams of the joints, back and stuff-over seat.

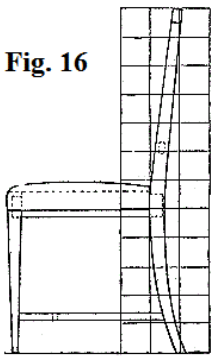


Fig. 16

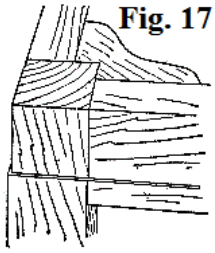


Fig. 17

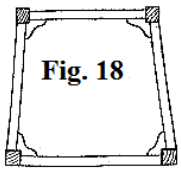
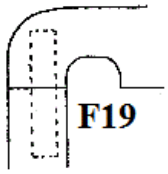


Fig. 18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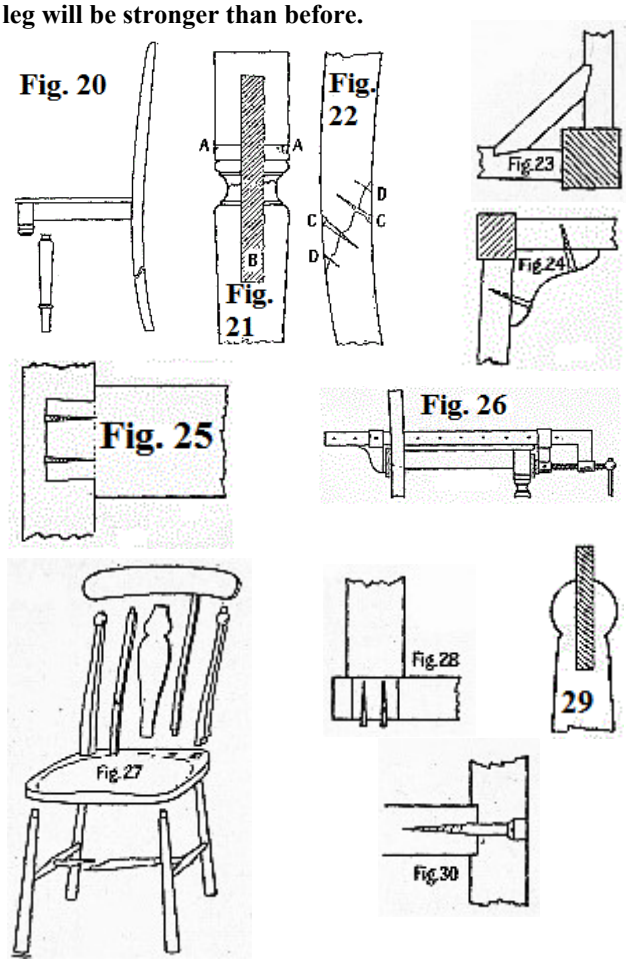
Chair Repairing. This is often easily done. At Fig. 20 two common leg breakages are shown. Always repair such breakages before the fractured edges have got rubbed. The parts will then fit closely; whereas, if there is delay, the ragged edges may get injured and a neat joint may be difficult to effect.

The front leg is repaired by means of a long dowel inserted (Fig-21). First cut off the small turned fragment which is attached to the top square block of the leg. Use a fine tenon saw, and cut across at AA. Warm the broken surfaces, glue the little part which

has been removed to the main body of the leg, and lay the work aside till the glue is set. Now bore both parts of leg (square portion and turned piece) for a long dowel (B), which should be of beech or oak not less than ¾ in. in diameter. The dowel must go well up into the square block and at least 2 inches into the turned leg beyond the fracture. Glue everything well, and the leg will be stronger than before.



Chair. Figs. 20 - 30. Diagrams illustrating how various breakages can be easily mended. See text.

The back leg is repaired with screws, as at Fig. 22. If any of the splinters are loose, glue them down so that the parts will fit quite closely. Hold these together, and, at the angle indicated in the diagram, carefully bore holes for two screws, one at each side *(see* CC). Countersink for the heads. It is well to use a fine bradawl first, and then a gimlet. The screws must be of a fairly fine gauge, and either 1¼ in. or 1½ in. in length. Try the screws, and, if all is right, warm the broken surfaces: apply thin hot glue and screw up. At the two ends of the joint (DD) insert a couple of needle-points. The holes countersunk for the screw heads are filled with a cement made with beeswax and resin. This is stained to the colour of the wood, and when trimmed off and rubbed over with polish the repair should be satisfactory.

The Repair of Frame Joints

Chair frame joints frequently work loose on account of the glue giving way. Seat rails are tenoned to the legs, and when the tenons become loose the leg is unsteady. The inside angles of chairs are usually braced, either with a strut wedged in, as Fig. 23, or with a brace screwed on, as Fig. 24. If the bracing works loose the leg will probably be insecure. The joints of a chair with wood seat can be repaired with little trouble; but in the case of an upholstered seat, it is well to allow the repair to stand over until the chair needs to be re-upholstered. In this latter case it may be stripped, and then re-covered after the joints have been repaired.

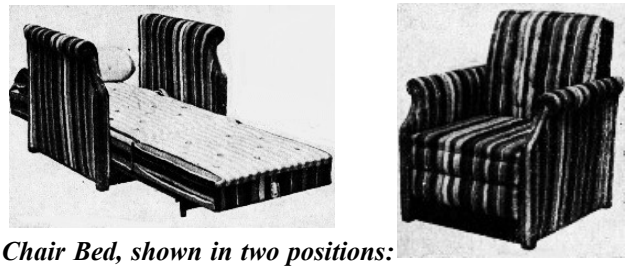
Knock the parts loose and scrape off all the old glue. As the tenons may have become a little too small, owing to shrinkage, they should be wedged in order to tighten them. As the tenons do not go right through the leg they will have to be blind-wedged, as Fig. 25. That is, two cuts are made in the tenon and narrow wedges inserted. When the tenon is glued and driven home with the mallet, the wedges increase its width and thus ensure a tight fit. The mortise holes in the leg may be gently pared to permit of the wedged tenon acting like a dovetailed joint. After the four seat rails have been glued up the braces or struts are glued and screwed in position. Work of this sort usually requires to be cramped up with a regular joiner's cramp, the method of using which is shown in Fig. 26. The cramping is very important, as the glue will not hold satisfactorily unless the parts have been put under heavy pressure.

Kitchen chairs, which are frequently used for purposes for which they were never intended, have a habit of falling to pieces, but if properly repaired they will be as good as new. Taking Fig. 27 as a typical example, the best plan is to knock all the parts separate, marking each, so that its correct place is known. Clean off the old glue, and, if any of the leg joints fit rather loose, take a paring off the ends, so that a thicker portion will make the entry. A broken stretcher rail may be repaired in the way already described for a back leg *(see* Fig. 22). It may, however, be less trouble to make or buy a new stretcher. Glue the rails to legs, and then glue and knock the four legs into the seat, using the cramp if possible. See that all four legs are level.

Coming to the back, if the tenons of the two outer uprights are loose they will have to be wedged (Fig. 28). The wedges are driven in from the underside. If the top pin which enters the shaped rail is broken, cut it off, and bore the upright for a beech or oak dowel pin as Fig. 29. The back parts, including the central and two intermediate slats, are first fixed to the seat. The holes in the top rail are then glued, and this part coaxed on with the mallet. It is usual to wait and see that everything is correct and in line before driving in the wedges used to strengthen the outer uprights.

The arms of kitchen armchairs often come loose owing to the breaking of the screw which holds them. Punch out the head of this screw. The other end may be withdrawn with the screwdriver if a nick is first made across it with a file. The new screw should be inserted so that the smooth shank will pass the line of joint *(see* Fig. 30). It will then run no risk of breaking, and the

countersunk hole may be filled with a stopping of some kind.



Chair Bed, shown in two positions: open for use at night, and closed to form an easy chair. (Courtesy of Oetzmann & Co. Ltd.)

CHAIR BED. This is usually an armchair, generally provided with an iron framework, which unfolds so that it can be used as a bedstead. The chair legs and seat remain in their normal positions, and the article is extended by turning over the upper part of the seat and lowering the back. The extremities of the extensions are supported on extra legs which fold. It is fitted with cushions, usually three in number, which serve as a mattress. It may be entirely of iron or may have wooden or brass legs.

The illustrations show another form of chair bed. When folded this has the appearance of an upholstered easy chair. The seat and back are folded down, as shown, to convert it into a bed. *See* Bed Sitting Room.

CHAIR RAIL. This is a wooden moulding fixed to the walls to prevent damage by chair backs. It can take the place of the dado, and if different shade or colour of wall covering is used above and below the rail, the result can be made very pleasing. The moulding can be obtained in the white, i.e. not stained or painted, and when ordering allowance should be made for waste in mitring corners. There will usually be at least 10 corners, and 2 ft. extra should be obtained.

Start on the longest lengths of wall first; the short lengths and odd corners can be fitted with the moulding left over. The mitres for the corners should be cut neatly with a tenon saw, and with the aid of mitre box or board. When making the joints for the fireplace and bay window corners, do not forget to cut outside corners, or some of the moulding will be wasted in recutting. If it is necessary to join some of the lengths, do not merely lay them end to end. Cut each end at an angle, of 45°, so that they can be overlapped. Such a joint will scarcely be noticed when glass-papered and painted.

Cut nails should be used to fix the rail to the wall, and a suitable height is 36 to 39 in. from the floor. Punch the heads of the nails well in and cover with plaster of Paris; putty is sometimes used, but it shrinks in drying, and is unsightly. The rail should be treated to match the other woodwork of the room. The moulding can also be obtained in oak, mahogany, or walnut.

CHALK: In the Soil. Chalk is not so good as lime for heavy soils, but on light, sandy land it is to be preferred, because of its slower action. For this purpose it should be finely ground and put on the land in winter. Calcareous soils with solid chalk a few inches below the surface dry out quickly, and the best way to keep trees and plants flourishing in such land is to mulch the surface in early summer.

So far as soil treatment is concerned, a great deal can be done by breaking up some of the chalk with a pick or strong fork, and using rotting or charred turf, or burnt clay, if procurable, as freely as possible. A good deal of it should be packed below and around the roots of each tree. *See* Gardening; Rose; Soil.

CHALK STONES. These are gout stones or tophi, which form beneath the skin in gouty patients, frequent sites being on the ear or knuckles. They are composed of urate of soda. *See* Gout.

CHAMBERMAID. In a hotel the chambermaid's duties are similar to a housemaid's in a private house. She attends to the bedrooms and bathrooms, and the passages and staircases in that part of the house where these rooms are situated. She brings hot water if it is not laid on, draws the window blinds, and calls visitors. She makes the beds, cleans the rooms, lays and lights fires.

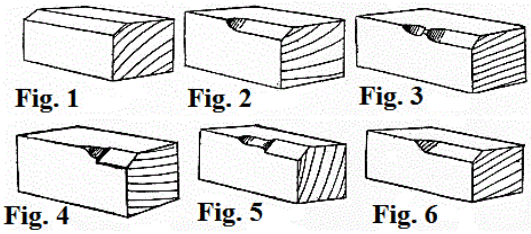
CHAMBERTIN. One of the most famous of all the red Burgundy wines is Chambertin. It possesses a fine, clear, dark red colour, and fulfils on the palate the promise held out by its charming bouquet. Soft and velvety, it is never sugary or "spirity." It is a warm, generous, and at the same time delicate wine. *See* Burgundy; Wine.

CHAMFERING. The object of chamfering may be either for decorative purposes or to lighten the appearance, or sometimes simply to remove a sharp edge. It is usually at an angle of 45° with the main surface, though it may be worked at any angle which the particular nature of the work requires.

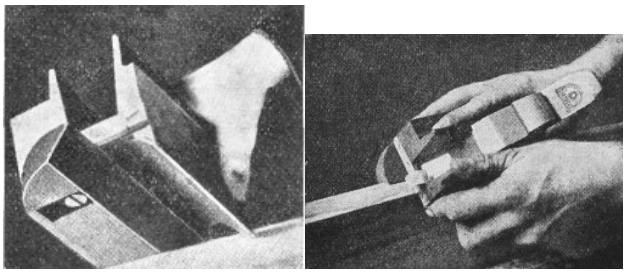
The commonest form of chamfering and the quickest to carry out is when it is run along the entire edge without stopping (Fig. 1), in which case the work is done with an ordinary plane. In a type more frequently used the chamfer is run for a certain length and then stopped a short distance before reaching the end. Figs. 2 to 6 are typical examples of stops employed; Figs. 3 and 6 are more suitable for oak work. Frequent use is found on the inside edges of framings, such as panelling, and work for ecclesiastical purposes makes great use of chamfering.

In cases where the stop is flat, such as Fig. 6, the flat side of a chisel is used to cut the wood, and the reverse side for such as Figs. 2 or 3. As it is impossible to use an ordinary plane for the whole length of a stop chamfer, the ends have to be cut with a chisel or a bull-nose plane, which is capable of working very close to the ends, as there is only a very short distance between the cutter and the front of the plane. Where a great deal of

chamfering is to be done, a special chamfer plane (Fig. 7) is often used, the advantage of which is that it can work right up to the stops, and automatically regulates the depth of the chamfer.



Chamfering. Figs. 1-6. Usual forms of chamfered edge and the principal stops employed for different purposes by the woodworker.



Chamfering. Fig. 7. Chamfer Plane, showing the correct method of holding this tool.

When a very deep chamfer has to be cut, it is advisable to make several saw cuts at various points along the edge (not quite down to the finished depth), to obviate the tendency of the wood to split out when removing the bulk of the waste with the chisel; for should the wood start to split, the split cannot run farther than the next saw cut. The chamfer is finished off with a chisel and plane. Finally a scraper is used, and then glasspaper.

Sometimes the tool known as a chamfer shave is used for chamfering. In appearance it is like a spokeshave (q.v.), and used in the same way. It is capable of producing splayed and stopped chamfers.

CHAMOIS LEATHER. For cleaning windows and glassware, and as a polisher for metal ware generally, nothing is better than so-called chamois leather. It is really made from sheepskin, which after being freed from the wool is split into two layers. The top layer, or grain, is made into a variety of coloured leathers; the under layer, or flesh split, is used for chamois leather. It is treated with fish oil, and during oxidation the colour changes from white to dark yellow. The skins are pressed and washed to free them from excess of oil, and the leather is then bleached and finally buffed to give it a fine nap.

The two characteristics of chamois or oil leather are its softness and its resistance to the action of water. For this reason the name washleather has been given it, and washable gloves are made of it.

In washing these gloves a simple method is to wear them, while a good washing in warm, soapy water is given, working them about on the hands so as to remove grease and dirt. Wash again in clean, warm, soapy water, and if a little soap is allowed to remain in them when they are hung up they dry more satisfactorily.

A cleaning leather is the better for frequent washing in soap and warm water with a little borax, afterwards rinsing in cold water. Then squeeze it, pull the leather out flat, and spread on a board or table. When almost dry, pass it through the hands and stretch it out until it is flat, repeatedly smoothing the surface. In this way the leather will dry soft. *See* Glove; Leather.

CHAMPAGNE. This sparkling wine requires to be looked after very carefully. If there be the least sediment or deposit the wine requires to be filtered into fresh bottles. The wine matures quickly, and is at its best after from 8 to 15 years, although there are instances of champagne having retained its excellence after 40 years. Champagne is known by the name of the shippers. Amongst the leading brands are Ayala, Bollinger, Clicquot, Goulet, Heidsieck, Irroy, Moët and Chandon, Perrier-Jouet, Pol Roger, Pommery and Louis Roederer.

The champagnes shipped to Britain are generally dry, and styled brut or nature, which should mean that they contain no added sugar or liqueur. They are obtainable in half bottles, pints, quart bottles, magnums (double bottles holding 4 reputed pints), and jeroboams (double magnums). Champagne keeps better in bulk.

Ice should never be put into it as it spoils the flavour. The bottle should be placed in an ice pail for 10 to 20 min. before serving. At a dinner party where various wines are served champagne is usually given with game or entrées and after. The best glass for champagne is tulip-shaped with a deep stem cut at the bottom of the bowl. This shows the steady stream of bubbles and keeps the wine lively longer than a shallow glass. *See* Dinner; Wine.

Champagne Cup. To make this agreeable drink, take a bottle of champagne, a liqueur glass of brandy, ½ liqueur glass each of yellow chartreuse, curaçao and maraschino, and two bottles of seltzer, soda, or Perrier water. Add a lemon cut in slices, a few sprigs of borage, and ice and sugar to taste.

Another recipe is the following: Put a large lump of ice in a jug and add a bottle of champagne, a bottle of seltzer, soda, or Perrier, and a liqueur glass each of brandy, curaçao and abricotine. Stir well and add various kinds of fruit, borage, mint, and cucumber peel.

CHANDELIER. Consisting of a branched candle, electric or gas holder depending from the ceiling, the modem type of chandelier is of gilt, bronze or gunmetal, and is usually specially designed for rooms decorated in the fashion of particular periods. Thus in a room of Jacobean type might be placed a Flemish chandelier in brass. For large rooms of 18th century type, especially with French furniture, a chandelier

hung with glass lustres is effective, although it is difficult to keep clean, and has to be shrouded in dust-bags when the room is out of use. For cleaning purposes the prisms must be taken down and laid on a tray in order, noting exactly how they were hung. When they have been washed and dried, they must be carefully replaced in their order after the brackets have also been cleansed.

There are also elaborate and costly chandeliers in gilded and painted wood, which are replicas of those of the William and Mary period. *See* Bent Iron Work: Candlestick; Electric Lighting; Gas.

CHANGE OF LIFE. The climacteric or change of life is the period at which women cease to bear children: and as the change frequently affects the mind as well as the body, especial care of the health is always called for. The age at which the change occurs is generally between 45 and 50, but may be either earlier or later in certain cases. The child-bearing period usually lasts about 30 years.

The manner in which the climacteric occurs is irregular. In some cases menstruation suddenly ceases, but in most it first becomes irregular, remains so for two or three years, and then finally stops. Excessive bleeding at the periods or bleeding in the interval should not be accepted by any woman as due to this cause alone without consulting her doctor.

Amongst the symptoms common at this time perhaps the most unpleasant are flushings of the face and limbs, frequently preceded by chilly sensations, and followed by profuse perspiration. Some women are prone to corpulence while others become thin. Osteo-arthritis is another of the evils to which women are exposed. Nervous symptoms are frequent, while headache is rather common, but often due to the need for glasses. Other symptoms are backache and indigestion.

The first thing necessary for a woman who is suffering from the troubles incident to the change of life is to realize that they are natural, and that they will pass away in the course of a few years. This will ease her mind. At the same time, however, she should realize that some increased attention to her health is advisable for a few months, or even years. The following aperient is useful:

Confection of senna	1 oz.
Confection of sulphur	1 „

Mix well. Take one teaspoonful at night when necessary.

As an alternative, one to three grains of cascara or a liquid preparation of cascara may be taken at bed time. The following simple dinner pill may be tried:

Aloin	12 grains
Extract of nux vomica	6 grains
Alcoholic extract of belladonna	3 „

Make into 12 pills. Take one pill after the evening meal when required.

If the appetite is poor, a tonic may be useful. Strong tea, indigestible foods, and alcohol in any form must be avoided. Warm baths at bedtime, two or three times a week, are soothing to the nerves.

Many women are prone to be emotional; they should strive constantly to control themselves and, generally speaking, to take a cheerful view of life, which does so much to banish worry and anxiety. The troublesome flushings are often relieved by bromides, and the following may be taken:

Potassium bromide	45 grains
Arsenical solution	20 minims
Syrup „ „	6 drams
Cinnamon water (enough to make)	6 oz.

Make into a mixture. Take two tablespoonfuls after the midday and evening meals when required.

It has to be pointed out that bromides are only to be taken when really required; if their frequent use is necessary, it should be under the eye of the doctor. Flushings are also helped by taking ichthyol. Beginning with a tablet of 2½ grains, the dose is increased gradually till in about three weeks time four tablets are being taken thrice daily. If at any time there is a persistent taste of the drug in the mouth sufficient has been taken. Iron may be required in some cases where there is shortness of breath and want of general tone due to anaemia, and may be taken in the form of Blaud's pills or in a mixture. *See* Anaemia.

CHAPERON. Originally a hood worn by matrons, the word chaperon came to be applied to a married woman who took charge of an unmarried girl on social occasions. A hostess often gives dances and dinner parties to which it is understood that chaperons are not invited, the hostess herself acting in that capacity to any unmarried girls present. At important social functions girls are chaperoned at least during their first season.

CHARACTER: The Legal Aspect. It is usual for mistresses when engaging a servant to ask for a character, that is, something from a former employer about the antecedents and qualifications of the person requiring the situation. A character of this kind should never be given unless asked for.

Even if what a mistress says in giving a character is in fact untrue, yet if she says it honestly she will be protected by the law so long as she is not actuated by spite or malice.

Beware of giving a false character. If a mistress dismisses a servant whom she knows to be a thief, and out of good nature writes that she is honest, and in her new place she steals, her old mistress is liable to the new mistress. A servant who obtains a situation by a forged or false character is liable to fine or imprisonment. So is anyone who knowingly gives a servant a false character, by means of which the servant obtains another situation. *See* Servant.

CHARADES: How to Play. This game is suitable for any number of players above 7 or 8. Two persons

pick up sides, and one side then goes out of the room and chooses a word of two or more syllables, each syllable being a separate and complete word, e.g. sel-fish (sell fish). The syllables are then acted in two scenes, and the whole word in the final scene.

The usual method of procedure is for the syllable to be spoken by one of the players, though there is no need for the scene itself to give any direct representation of the word. Another method is for the syllable to be acted, though not necessarily spoken. Thus, in the example chosen, the first scene might show a shop, with a brisk trade, and the second might represent a party of fishermen coming home with their catch, while the whole word should not be difficult to act; two children playing could easily convey the necessary effect. At the end of the performance the audience has to guess the word chosen.

The game is more successful if a few words have been selected beforehand and a possible scenario drawn up, otherwise the time occupied in discussion by the acting party is apt to be wearisome to the members of the audience.

Historical charades is a picturesque variant of this game. The word to be guessed is the name of some person famous in history or fiction, and a short name is generally chosen, as upon its length depends the number of scenes to be enacted. Each scene depicts an incident in the life of some other celebrity whose initial letter occurs in the name selected for the charade.

No names are introduced by the actors that will give the subject away. About five people can comfortably take part in the scenes. No theatrical costumes, scenery, or other property are necessary; the house can furnish all that is required in the shape of a few shawls, scarves, sheets, hats, coats, and walking-sticks. *See* Children's Party.

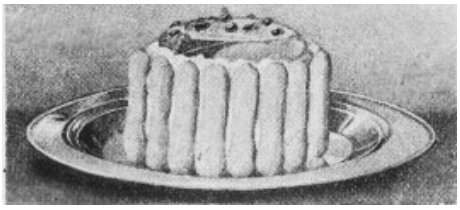
CHARCOAL: Its Domestic Uses. Although charcoal has a limited use in the house, it has excellent deodorant properties, as well as the power of taking the colour out of certain solutions. It is produced by partly burning certain kinds of wood and bones, the former variety being known as wood charcoal, and the latter as animal charcoal.

Wood charcoal finds one of its chief uses in the garden. A few pieces mixed with the mould in which plants are potted keeps it sweet. For a similar reason a piece should be placed in the water of the glasses in which bulbs are grown. Stakes driven into moist ground resist decomposition for long periods if the ends are first put into a fire and so partly converted into charcoal. Similarly, casks charred inside resist fermentation better than uncharred casks.

Mixed with any foul material charcoal helps to destroy the odour. It has been found to absorb any smell that may arise when clothes are put away in a wardrobe or chest of drawers. For this purpose some moderate sized pieces should be placed among the clothes. Powdered charcoal serves as a tooth-powder, neutralising some of the effects of decay.

Some coloured liquids, e.g. red wine and fruit juices, lose their colour when filtered through powdered charcoal. Charcoal should not be used to purify drinking water.

CHARLOTTE RUSSE. A jelly mould is lined with a little jelly at the bottom and when nearly set glacé cherries are pushed through it to the bottom or the mould and sponge cakes or savoy fingers placed round the sides. A dessertspoonful of castor sugar and half a dessertspoonful of gelatine should be dissolved in a ½ pint of milk over gentle heat. The milk is then strained and a few drops of vanilla essence added; also, if desired, a tablespoonful of sherry. Half a pint of cream should be well whipped and the strained milk stirred in when cool. The mixture is poured into the mould and left in a cool place or on ice until it has set, when it is turned out.



Charlotte Russe, a delicious party sweet

CHARPIE. Shredded linen used for the dressing of wounds is termed charpie. It is made of flax between layers of gauze, and used to form part of the first field dressing of the soldier; but gauze is now deemed to be sufficient. The shredding makes the dressing more absorbent and protective, but these purposes are usually achieved by the use of gauze or lint and absorbent cotton-wool. *See* Bandage; First Aid.

CHARR: How to Cook. Amongst fresh water fish charr is highly nutritious. It should be washed well and dried before cooking. To fry it, cut the fish into steaks, coat with egg and breadcrumbs, and fry in hot fat, or the fish may be first dipped in batter.

Charr may be broiled or grilled. Cut the fish into steaks about 1 in. thick, season with pepper and salt, wrap in pieces of oiled paper, and gently broil them over a clear fire. To grill charr with a gas fire, place it on a greased grid-iron and put this under the griller, which must not be turned on full. Charr cooked in any of these ways should be garnished with lemon or parsley, and served with melted butter sauce.

CHARTREUSE. There are three kinds of this celebrated liqueur. The white variety is the mildest; the green is the most potent and highly prized, especially in France; the yellow is the liqueur most widely used in all countries. Chartreuse is distilled from certain aromatic plants. *See* Liqueur.

CHARWOMAN. A charwoman is a worker who goes out by the day or hour to clean private houses, offices and shops. She may be paid by the week, day, half-day or hour, and her pay may include or exclude food.

A charwoman must be insured under the health

insurance scheme, but not against unemployment. If she works lor a single employer he is responsible for the weekly payments If, however, she works for a number of employers the one who employs her on Monday is, strictly speaking, responsible. In some cases, however, the employers agree to take it in turn to pay the employer's share of the premium.

If a charwoman is employed regularly—for instance, once a week, or once a fortnight or month—she is a workman within the meaning of the Workmen's Compensation Acts and the employer is liable tor compensation if she is injured by an accident arising out of and in the course of her employment. It is wise, therefore, to include her as a servant when insuring against risks under this act. If employed only on odd occasions she does not come within the act. *See* Insurance.

CHAUDFROID SAUCE. A general favourite for coating meat made up into cold entrées, chaudfroid sauce requires skilful cooking to be of the right consistency. To make the white variety, heat up ¾ pint white sauce, adding to it 3 sheets of gelatine, previously dissolved in a little white stock, and 2 or 3 tablespoonfuls of cream. Strain the whole through a tammy cloth, and use the sauce when it is just on the point of setting.

Brown chaudfroid sauce is made from ¼ pint good brown sauce, 1½ tablespoonfuls liquid aspic, and 2 oz. meat glaze. The glaze is dissolved in the sauce before the aspic is added, and the whole strained and used when cooling. *See* Sauce.

CHAUFFEUR. The driver of a motor car is termed a chauffeur, and certain qualifications are required for the post. He must be in possession of a driving certificate, which should be free from endorsement, and in view of the responsible nature of his work he must be of good personal character. He should also have the technical knowledge required to do his own repairs and to keep the car in proper condition. He ranks as a skilled mechanic, and is generally an outdoor servant. Both men and women are employed.

The employer is liable for injury or damage to person or property caused by his chauffeur's negligent driving or handling of the car while on his master's business. But if the chauffeur takes the car out for his own purposes—e.g. to call on one of his own friends, or for a joy ride with the housemaid—and does damage while so engaged, the employer is not liable. The latter must always insure against accidents to third persons and property caused by his car when driven by his chauffeur.

A chauffeur must be insured under the national health insurance scheme and the employer is responsible for the weekly payments. Unless the chauffeur is a woman, the employer must take out a licence enabling him to keep a male servant. This costs 15s. a year. *See* Insurance; Motor Car; Negligence; Servant.

CHEDDAR: A Mild Cheese. This is one of the cheapest varieties of cheese. There are several methods of making Cheddar, besides the noted west of England way, other varieties coming from Ayrshire and Canada.

Cheddar cheese is usually made from morning's and evening's milk that has been ripened. The correct degree of ripeness is difficult to gauge, and the inexperienced maker can only determine it accurately by tests. One way of ripening the milk is to keep it at such a temperature during the night that enough acidity will develop to ripen the morning's milk partially when this is added. The other method is to add a ripening or souring agent, such as a starter, to the milk in the morning, and allowing it to remain until sufficient acidity is obtained. The former method is satisfactory with careful handling, but the employment of a good starter will give more reliable results.

CHEESE AND CHEESE MAKING

Some Practical Hints for the Small Dairy

Our Encyclopedia contains articles on the various kinds of cheese, e.g. Cheshire and Stilton. This entry is followed by a number of entries on cheese dishes. See also Diet; Milk

Cheese is a valuable food-stuff, more especially double cheese, which is made from whole milk, and contains a large percentage of protein and fat. Unfortunately it is difficult to digest. It should be eaten with bread or biscuit in order to ensure that it is thoroughly masticated and sufficiently broken up before being swallowed. Soft, fresh cream cheeses are more easily digested than most other varieties. Cheese is a more concentrated form of nourishment than the best beef. Lean meat has about 70 p.c. of water, whereas good cheese contains only about 30 p.c. Fortunately, for those with a tendency to indigestion, cheese can be eaten with impunity if grated or pulverised. Puddings and other dishes of milk, eggs, and grated cheese are extremely nourishing.

The standard English cheeses, such as Cheddar, Cheshire, and Derby, are too large for the smallholder to make, as he does not usually have more than 7 to 10 gallons of milk daily, and only a portion of this is available for cheese-making. The utensils for making the larger cheeses are expensive. *See* Bulletin 43, Ministry of Agriculture.

Hygienic Making Conditions. It is essential that the milk intended for cheese-making should be perfectly clean and in good condition. Almost any clean, airy, and well-sheltered building having a good floor is suitable for cheese-making purposes, and if a cellar is available in which to ripen the pressed cheeses, so much the better. If a dairy has to be built, it should be of brick, with a cement floor falling to a channel which leads to a suitable gully placed outside the dairy and communicating with a proper drain. If pressed

and ripened cheeses are to be made, a similar building, to
be used as a curing-room, should be erected in line with the dairy, but sunk about 2 ft. in the ground, and provided with a floor of cement. A series of shelves, on which to place the cheeses, should be put round the ripening-room, and the walls of both rooms should be limewashed at least twice each year. When not required for cheese, the making-room would do duty as a butter dairy.

A suitable size for the making-room is 10 ft. by 8 ft., and for the ripening-room, 8 ft. by 8 ft. The roof may be of tiles, thatch, or galvanised sheeting, lined underneath with boards. All ventilators and windows should be made to open and close as desired, so that the rooms can be kept at a suitable temperature. In order to save expense, both rooms may be made of wood placed on three or four courses of brick to prevent rotting. If built of wood, the outside walls would need to be double, with an air space between. The making-room should usually be kept at a temperature of 62° F. to 66° F., and the curing-room from 58° F. to 62° F.

Cheese-Making Requisites. A table 6 ft. long by 2½ ft. wide, with raised sides and ends, and lined with tinned sheeting, is necessary. This table should slope to one corner, and be provided with an outlet and pipe to allow of proper drainage of the whey from the cheeses into a pail below. One or two well-made oak tubs in which to coagulate the milk are required; they should be of a capacity of 6 gallons each, and be provided with close-fitting wooden lids. The maker will need a large knife with which to cut the curd, a milk-strainer, curd-ladle, skimming-dish, and thermometer, cheese-moulds, boards, straw mats, measures, cheese-draining rack, set of wall shelves on one side ot the wall, measur-ing-glasses, pails, and brushes; also weights up to 28 lb. with which to press cheeses, and a supply of rennet extract. The measuring-glass, 1 oz. size, should be sub-divided uito drams.

Method Of Making. A pressed cheese, which is creamy in texture with a distinct cheese flavour and very palatable when ripe, is quickly made. Six gallons ot fresh, sweet milk are required for one cheese of standard size. The circular cheese-moulds should be 6¼ in. deep by 6¼ in. diameter, strongly made of tin, and perforated all round. In addition, the moulds should be provided with a circular tin disk and wooden follower.

The milk is first raised to a temperature of 90° F., and rennet, in the proportion of 1 dram to 3 gal., is added to bring about coagulation. The rennet is diluted with six times its volume of water, and then stirred into the milk. The milk is then stirred deeply from 3 to 4 min., after which the surface is kept gently moving to prevent the fat from rising, until coagulation sets in. The tub or vat is then covered with the wooden lid until coagulation is completed. The approximate time to cut the curd may be reckoned by multiplying by 2½ the time taken for coagulation to appear after the rennet is added, thus: Time of adding rennet, 8 a.m. Time coagulation commenced, 8.15 a.m.— 15 min. x 2½ = 37½ min. Time to cut curd 8.52 a.m. The curd—as the coagulated milk is termed—is ready for cutting when it feels firm and springy, and splits with a clean fracture when a finger is inserted and lifted upward through the curd.

A large knife, long enough to reach to the bottom of the vat or tub, is taken, and the curd carefully cut in cubes ¼ in. to ½ in. in size, the horizontal cut being made with a skimming dish. After cutting, the curd is gently stirred by hand, care being taken to remove particles adhering to the vat.

The temperature is now raised to 106° F. If a jacketed vat is used this is done by passing hot water into the jacket. The temperature should not be raised faster than 1° in 3 min., and the curd should be kept stirred during the process. If the cheese is made in a tub or unjacketed vat, the following procedure is adopted: If there are 6 gal. of curd in the tub and the temperature is 86° F., it has to be raised 20° to 106°. This temperature is attained in 4 steps of 5° each. The first step therefore, is to raise each of the 6 gal 5°.

Heating the Whey

A cheese cloth is laid over the vat and pressed down on the curd; a supply of whey is then ladled off into a bucket and the temperature of this raised by the immersion of the bucket in hot water. The temperature to which the whey should be heated is estimated thus: If 2 gal. of whey have been taken off, these 2 gal. must be raised 15° to 101°; if only 1 gal. had been taken, then the temperature would have to be raised 30° to 116°. The temperature of whey should never be raised above 120°.

When this heated whey has been returned to the tub, the mean temperature of the whole 6 gal. will be 91°, i.e. the first increase of 5° will have been effected. The three further stages in the process of raising the temperature to 106° are carried out in the same way. The stirring of the curd should be continued until the curd becomes tough and bright, and the particles, when pressed together in the hand fall apart and do not crush. The curd is then allowed to pitch and the whey is poured off through a straining cloth.

The curd is now spread evenly over the bottom of the vat, and salt in the proportion of 1 oz. to 2 gal. of milk is mixed into it. The curd is then carefully packed into the mould, which should previously have been lined with a cheese cloth, and put to press with 2 cwt pressure. It is turned the same evening and returned to press until the following morning. In the morning the cheese is taken from the press sewn in a calico bandage and again returned to the press for 1 hour after which it should be placed in a fairly dry draughty room for two days and then in the ripening room. It will be ready for use in about three weeks, when the weight will usually be about 6½ lb.

Unscalded Cheese. A cheese not unlike Welsh Caerphilly is quickly made and digestible but does not

keep well as it is unscalded. It is a popular cheese for consumption with salads in hot weather.

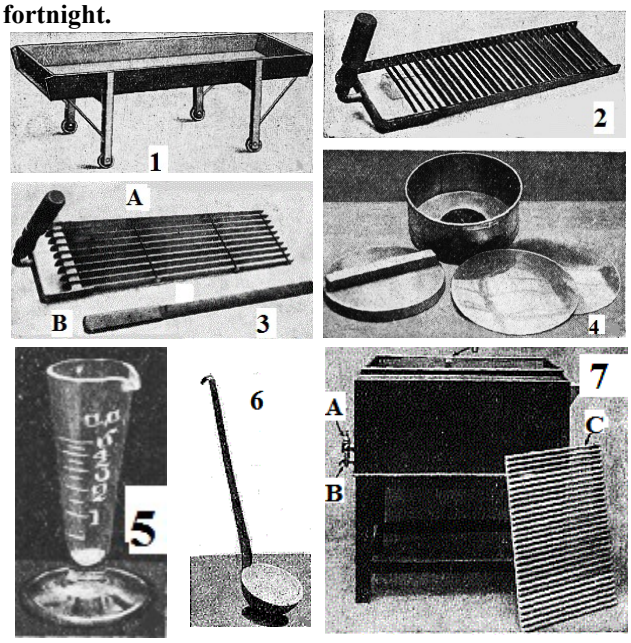
This cheese is made from mixed morning's and evening's milk. As the curd retains a large percentage of moisture (the whey), very little acidity is required, and, unlike the varieties requiring longer periods of ripening, it can be made in cold weather. Five gallons of whole milk will make a cheese weighing about 7 lb. The moulds for these cheeses should be flat, 9½ in. by 2 in., with removable bands which sink down as the cheese presses. Where a number of these cheeses are made they are piled one on top of the other when put to press, and only the top one requires a follower or board. Small moulds to make 1 or 2 lb. cheeses can also be obtained and are very convenient, as any number from 4 to 12 cheeses can be pressed at the same time with a large board placed between each layer.

When made without a starter the evening's milk is at once strained into the cheese vat or tub and well stirred to get rid of the odour of the cows and to lower the temperature slightly; in cold weather it is covered to maintain the desired temperature so that a certain amount of acidity will develop to ripen the morning's milk when added. In warm weather it is unnecessary to cover the evening's milk. When a starter is used, the evening's milk should be cooled down to 70° F. as soon as obtained, to check acidity, and stirred occasionally during the evening to prevent the cream rising. Next morning, when the temperature of the milk has been raised, a small quantity of starter may be added to produce enough acidity, so that when the morning's milk is added the milk is sufficiently ripened for renneting. If no test for acidity is available this must be judged, but care should be taken that the milk is not over ripe or the cheese will work too quickly.

The temperature may now be raised lor renneting. This should be 84° to 86° F in summer and 86° to 88° F. in winter. Rennet is added at the rate of one dram (mixed with about four times its bulk of water) to every four gallons of milk, and the whole should be well stirred for 3 min. To prevent waste the cream should be gently stirred in just before the milk begins to curdle. The curd is ready for cutting when it breaks cleanly over an inserted finger, which is usually 40 to 45 min after renneting. It is now cut into pieces about the size of ½ in cubes, this process taking 10 to 15 min., during which time the whey should be stirred gently.

When the curd is evenly cut and well separated from the whey it should be allowed to settle for 15 to 20 min. The whey is now drawn off. With small quantities (e.g. 5 gal.) this is best done by pouring off the whey through a cloth (over another vessel) and then gently tipping the curd into the cloth and tying up into a bundle. It is now left for 20 min., and then cut into 3 in.
cubes and the whole moved and turned to assist drainage. It should then be tied up again for another 20 min, after which the pieces should be pulled apart and again tied up. This should be done at intervals until the curd has a slightly acid taste and smell, when it may be cut into slices 1 in. thick, and packed in the moulds lined with cheese-grey. A smooth piece ot cloth is folded over the top and the cheese put to press. Pressure is gradually increased to 2 cwt.

After the cheese has been pressing 1 to 2 hours, it should be taken from the mould, and well rubbed with salt and, after the cloth has been rinsed in cold water, put back to press again until next morning, when it is taken from the mould and put into brine for 24 hours. This brine is made from boiled water with enough salt to float an egg. The cheese should be allowed to drain, and removed to a dry, airy room and turned daily for a fortnight.



Cheese Making. 1. Table used for cooling curds. 2 and 3. Vertical and horizontal knives for cutting curd in cubes; B, single blade of horizontal knife. 4. Typical cheese mould, with wooden follower and tin disks. 5. Glass for measuring rennet. 6. Enamelled ladle for collecting curds. 7. Cheese vat; A, draining tap for whey; B, draining tap for hot water; C, wooden rack; D, gauge for measuring liquid in vat. (1 courtesy of the Dairy Apparatus and Equipment Co.. Ltd.; 2-7. courtesy of the Dairy Supply Co., Ltd)

Soft Cheese. A soft cheese which is usually designated Cambridge cheese is made from whole milk and is in demand during warm weather. Two cheeses can be made from a little more than 6 quarts of milk. It is unwise to make larger quantities than required for speedy consumption, as this cheese deteriorates quickly. The temperature at renneting should be from 92° to 95° F. About ½ dram of rennet should be added to the quantity of milk mentioned, and the cheese tub should be carefully covered. It is advisable to use a smaller tub when making not more than four cheeses. The rennet should be diluted and be stirred in for 4 min.

When the curd is set and the whey is on the surface, the curd may be removed with a skimming dish and placed in the moulds in thin slices, a portion of unbroken curd being set aside to form a smooth upper surface on the cheese. The moulds are in two pieces, the bottom portion holding a threaded straw mat, which

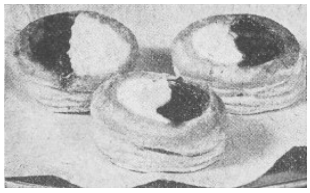
prevents the curd escaping, while the upper one is pierced with draining holes. They are about 7½ in. long by 5 in. wide and 6 in. deep, and should be made of elm wood. Moulds made of tin should not be used, as in these the curd rapidly loses heat, and drainage is thereby retarded. With tin moulds the curd settles into a flat cake, but with wooden moulds the curd adheres to the sides, causing the cheese to settle in the middle first, thus producing a curl in the curd.

These cheeses are not turned at all, and are ready for use when the wooden moulds can be removed without the cheeses losing shape, each cheese weighing well over a pound They are consumed fresh, being sold along with the straw mat upon which they have been drained.

Cheese Hopper. Small yellowish-white maggots, known as cheese hoppers, sometimes swarm in cheese where care has not been taken for its protection against insects. They are the grubs of a tiny black fly (Piophila casei) which lays its eggs upon cheese. Maggots have the mouth formed for sucking, and to reduce solid food to a condition in which they can absorb it they have to discharge upon it a fluid that will dissolve it. In this process chemical changes take place that may be highly injurious to the human system. The part of the cheese attacked should be cut away and destroyed.

Cheese Mite. Flour, linseed, and other household stores, as well as cheese, are attacked by Tyroglyphus siro, or the cheese mite. It gets into cracks in the rind of whole cheese, or in air cavities of cut surfaces, and, reduces the food to powder. Some consider that the presence of the mites improves the flavour of the cheese. Under the microscope, the powder resulting from their activity is seen to consist of dead mites, cast skins, etc. The injured portions should be cut out and the sound part scraped thoroughly, to get rid of mites, the rind getting attention as well as the edible portion.

CHEESE CAKE. For the lemon-cheese filling these require 2 oz. sugar, 1 oz. butter, 3 oz. flour, 1 egg, 1 tablespoonful milk, ½ teaspoonful baking-powder, a pinch of salt, and a little lemon flavouring. Cream the butter and sugar, and add a well-beaten egg and the sifted flour. Beat well, and stir in the baking-powder and essence. Line some deep patty tins with puff pastry (q.v.), then put in each tin 1 teaspoonful each of raspberry jam and the mixture, and bake in a hot oven for about 15 min.

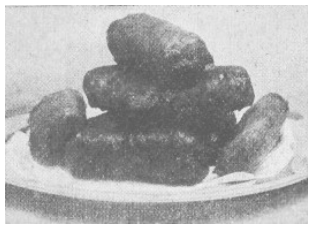


Cheese Cakes made with puff pastry, the centres being filled with jam and a lemon-cheese mixture

CHEESE CROQUETTE. Either vermicelli, macaroni, or spaghetti may be used for cheese croquettes. To prepare them, boil together ¼ pt. each of milk and water, adding 2 tablespoonfuls of spaghetti broken into short lengths. Boil these for about 10 min. or until the spaghetti is tender, and in a separate saucepan melt 1 oz. butter, stirring into it ½ oz. flour, and then the cooked spaghetti and milk and water. Stir and cook the whole gently until it boils and thickens, then mix in 2 oz. grated cheese, and season it well. Turn the mixture out on a plate to cool, and when cold enough to handle form it into even-sized balls. Beat up an egg on a plate, brush some of it over each ball, and then roll it in breadcrumbs. Heat some frying fat in a deep pan, and when it begins to smoke put in the balls, a few at a time, and fry them a golden brown. After draining them, serve on a paper doily garnished with parsley.

CHEESE FONDU. An appetising supper dish is prepared by mixing 3 tablespoonfuls of grated cheese and the same quantity of milk into 3 well-beaten eggs. Season the whole carefully. Thickly butter three little fireproof dishes and pour enough of the mixture into these to fill them about three-parts full. Bake these gently until they are lightly set and delicately browned, and serve them immediately in the dishes in which they were baked. Thin rolled brown bread and butter or thin fingers of dry toast should be served with this dish.

CHEESE FRITTER. Mix 3 oz. of flour with a dust of salt, and in a separate basin beat the yolk of an egg with ½ gill milk and 2 tablespoonfuls melted margarine. Stir these into the flour and beat the mixture well. Cut 6 oz. stale cheese into small strips or fingers, season with salt, pepper, and a few drops of vinegar. Beat the white of an egg to a stiff froth and fold it lightly into the batter, dipping the pieces of cheese in this and sliding them gently into a pan containing smoking-hot frying fat. Fry the pieces till they are golden brown in colour, turning them once to make sure that they are cooked on both sides. Drain them well, heap them on a hot dish, and serve them at once.



Cheese Fritters. A method of using up stale cheese in an appetising savoury.

CHEESE PUDDING. As this pudding sinks rapidly after leaving the oven, it requires to be served at once. To make it, stalk ½ lb. tomatoes, dip them for a few seconds in boiling water, and then peel them. Slice each tomato thickly and lay the slices in a greased pie-dish. Mix 6 oz. grated cheese with 3 oz. fresh breadcrumbs, and in a separate basin beat 2 eggs to a froth; mixing them with ⅓ pint milk. Stir these into the cheese and crumbs, adding as much more milk as is necessary to make the mixture the consistency of a thick batter. Season it carefully and pour it into the dish over the tomatoes. Bake the pudding in a moderately hot oven until it is set, well puffed-up, and browned.

CHEESE SAUCE. A sauce for serving with au gratin dishes, or with stewed celery or seakale. It is prepared as follows: Melt 1 oz. butter or margarine in a saucepan, stir in ½ oz. flour and, when smooth, add slowly ½ pint milk (or ⅔ pint milk and ⅓ water). Continue stirring until mixture boils, then add 1½ oz. grated cheese, preferably Parmesan, salt and pepper to taste, and, if liked, a little grated nutmeg. When serving an au gratin dish, mix a similar quantity of grated cheese with a tablespoonful of browned crumbs, sprinkle this over the sauce, add a few small pieces of butter, and bake the dish in a quick oven until the cheese melts and browns. *See* Au Gratin.

CHEESE STRAWS. These are frequently used as a savoury instead of cheese. Mix together 2 oz. flour, 3 oz. grated cheese— Parmesan if possible—and add a few grains of cayenne and salt. Into these lightly rub 2 oz. butter, and mix to a stiff paste with the raw yolk of an egg beaten up with 2 teaspoonfuls of cold water. Knead and roll out into a strip about 4 in. wide and ½ in. thick. Cut the mixture into narrow strips like large matches and bake them on a tin lined with greased paper in a quick oven till they are a delicate biscuit colour. They burn very easily, so need care; they are also very brittle and require gentle handling. They keep for at least a week in a tin, and can be re-warmed.

CHEESE TOAST. This savoury is made by boiling six almonds for 2 min., skinning and shredding them, and then frying them a light brown in a little salad oil. Coarsely chop 1 tablespoonful of chutney, put it into a small pan, and add to it the fried almonds, 2 tablespoonfuls grated stale cheese, and a little salt and pepper. Heat all these ingredients thoroughly and serve heaped up on small rounds of hot buttered toast. Small pieces of fried bread may be used instead of toast.

CHEESE TURNOVER. These can be eaten immediately after making, or reheated the following day. Mix together 1 oz. of boiled rice, 2 oz. of grated cheese, an egg, and 1 tablespoonful of thick cream, and season the whole with salt and red pepper. Make ½ lb. of pastry (q.v.), roll it out thinly, and cut it into six neat rounds. On each of these pile a tablespoonful of the mixture, damping the edges of one side of each and folding the pastry over to make semicircles. Have ready a pan of deep fat heated to boiling point, drop in the turnovers, and fry them to a golden brown, afterwards sprinkling them with salt and serving very hot.

CHEF: A Professional Cook. The chef is the principal cook of an hotel or restaurant, or of a house where a considerable staff is maintained. He must be a master-cook who has had experience in a first-class kitchen, and should be provided with a diploma from a recognized school. He—or she—must be able to compose a menu, and to take the principal part in or direct its preparation; he is expected to be capable of devising new dishes, and not to be entirely dependent on the recipes of any cookery book.

It is possible to secure a complete professional training in the properties and qualities of different foods, and in the science of their preparation, at various places.

A chef's cap is made of white duck, twill, or linen. It is of no special size, and can be made by cutting a round of material 22 or 23 in. across, and pleating it into a band, 2 in. deep, and folded to the exact size of the head.

CHELSEA BUN. This is made from 4 oz. of flour, ¾ oz. butter (melted), a little more than ¼ oz. yeast, ½ teacupful of milk, and about 1 oz. sugar. Cream a pinch of the sugar and the yeast together, pour the milk over the melted butter, and mix all together with the warmed flour to a light dough, kneading it well. Leave it to rise, then repeat the kneading process, and roll the dough into a square. Spread it over with 1½ oz, currants and ¾ oz. sugar, roll it up, and cut it into 5 or 6 pieces. Let these stand for a few minutes, coat with a little beaten egg, and then bake the buns in a hot oven for about 15 min.

CHELSEA CAKE. The ingredients required for a Chelsea cake are 10 oz. flour, 4 oz. butter, 6 oz. castor sugar, 5 eggs, ½ gill milk, and a teaspoonful baking-powder, and vanilla to taste. Sieve together the flour, baking-powder, and a pinch of salt, and cream together the butter and sugar. To the latter add the eggs, beating each in separately, then the flour, etc., and lastly the vanilla and milk. Put the mixture in an oblong baking-tin lined with two layers of buttered paper, and bake it in a moderately hot oven for about an hour.

In the meantime, prepare a filling for the cake by chopping up 2 tablespoonfuls of dried and shelled walnuts, and pounding them in a mortar with the same quantity of ground almonds, a tablespoonful of apricot jam, and a little lemon-juice and orange-flower water. Add enough sieved icing sugar to mix the whole to a smooth paste. Slit the cake into halves and put the icing between them.

Make a little white icing and pour it over the top and sides. Decorate with halves of walnuts and preserved rose or violet petals.

CHELSEA CHINA. True Chelsea is always soft-paste, easily marked by a knife, and as most imitations are in hard porcelain, the presence of a forged mark, either the triangle or the anchor, should not deceive.

Chelsea ware began with undecorated groups in translucent white, like skimmed milk, and passed thence to four-sided bottles and octagonal tea-ware, decorated with Aesop's fables or Japanese designs. After producing hexagonal jars, dishes in the form of birds and vegetables and the like, Sèvres and Dresden

influence introduced rich ground colours, especially pea-greens, turquoise, and the peculiar Chelsea claret, with panel paintings of pastoral scenes and Oriental birds. Besides the figures and groups, knife-handles, stick-knobs, scent-flasks, etc., were much favoured.

Careful imitations were formerly made at Coalport and Paris, and there are many inferior modern forgeries. These may often be detected by their gaudy colouring, the flesh tints of the cupids, and the tell-tale gilding of the anchor. *See* China.



Chelsea China. Examples of the delicately coloured and gracefully fashioned old English ware. The characteristic figures represent: left, Justice, and right, Diana (Courtesy of Law, Foulsham & Cole, Ltd.)

For examples of Chelsea China see page 406.

CHELSEA PENSIONER. The name is given to a prescription for rheumatism and gout which was obtained from a Chelsea pensioner. It has been subject to many alterations, but the following is probably the original prescription: Powdered guaiacum, 1 dram; powdered rhubarb root, 2 drams; cream of tartar, 1 oz.; sulphur, 2 oz.; and one nutmeg, grated. These powders are mixed together and then made into a paste or electuary by incorporating honey 12 oz. The electuary is taken in doses of from one to two teaspoonfuls, night and morning. *See* Rheumatism.

CHENILLE. The name is derived from the French word for caterpillar. Chenille trimmings and furnishing fabrics all have a certain velvetiness of appearance, and this is due to a method of manufacture which begins with the formation of a caterpillar of cut fringe.

Ordinary cloths are made by one weaving, but chenille fabrics are made by two. First of all a fabric is woven in bands of colour, and then that fabric is slit lengthwise into narrow strips, so providing the caterpillar—a furry coloured strip of fringe supported by lengthwise threads, arranged to hold the fur securely. This caterpillar is re-woven across a thinner set of threads, and the colours form the pattern seen in the completed cloth.

Chenille may be cotton, wool, silk, or other material. Cotton chenille is made into self-coloured window curtains, and their colour has a peculiar bloom, due to the method of making. Wool chenille is made into a variety of seamless Axminster carpet squares. Chenille in various colourings is also extensively used for embroidery, knitting, and crochet work.

The pile of chenille can be made either long or short. The article is generally decorative rather than durable, although good wear is given by the best qualities if fairly treated. It should be realized that chenille is less able to stand severe treatment than velvet fabrics of more substantial construction, and the articles should be used with care, especially in cleaning. Rough handling is likely to break the light warp threads which form the support of the caterpillar or pull out the fur from its foundation.

Cotton chenille window curtains can be washed in a lather of good soap flakes; as the surface is bushy and rough, handling is to be avoided; it is advisable to steep them well, rinse thoroughly, and dry in a good current of air. Wool chenille curtains and table-covers can be dry-cleaned more safely than washed.

CHEQUE. A cheque is a negotiable instrument—that is, it can pass from hand to hand like cash unless it is marked "not negotiable." Thus, if a cheque is stolen or obtained by fraud, anyone who takes it in payment of an account or cashes it and does so in good faith without notice of the fraud or the theft, and before it is overdue, has a good title to it and can enforce payment. A cheque is overdue when it has been more than a reasonable time in circulation and a cheque over a week old may well be overdue.

A cheque may be made payable either to a named person or 'order,' or to a named person or 'bearer.' The payee of an 'order' cheque cannot transfer it to anyone else or obtain the money for it without writing his name on the back—'indorsing' it—but a bearer cheque passes from hand to hand by delivery without indorsement. If the person to whom a cheque is transferred is not paid by the person who transferred to him, he can sue the drawer.

If someone forges a man's signature as drawer of a cheque and his bank pays it, the bank must bear the loss, however clever the forgery; but if a man makes a cheque payable to Jones or order, and someone forges Jones's name and cashes the cheque the bank can charge it against the drawer's account. The bank is supposed to know the signature of its customers, but not the signatures of persons in whose favour its customers draw cheques.

Crossed Cheques. A precaution frequently taken in writing out a cheque is to cross it by drawing two parallel lines across it, thus \\. A cheque so crossed may be indorsed by the payee in the usual way; it cannot, however, be exchanged for cash at the bank, but must be paid into a banking account. If in addition the name of the payee's bank is written between the lines of the crossing the cheque can only be paid into that bank. The addition of the words "$^{a}/_{c}$ payee" to the crossing means that the cheque cannot be indorsed to any third person by the payee.

Another method of protecting a cheque is to write on it the words 'not negotiable' either with or without a crossing. If a cheque so marked is indorsed by the payee to some third person, that person and any



CHELSEA CHINA: BEAUTIFUL AND RARE SPECIMENS

Examples dated 1755. 2. Scent bottle, parrot and Cochin China cock. 4. Pug Dog. 6. Covered vase after Japanese Kakivemon ware. 7. Tureen: rabbit. 11. Dish. 13. Flower vase: boys with fish. 17. Tureen. 19. Bird with cherries. 20. Group after Boucher. Other dates: 1. Lord Chatham with America (1766). 3. Clock case (c. 1759). 5. Reaper (1760). 8. Painted vase: death of Cleopatra (1762). 9. Dish (1760). 10. Music Lesson after Boucher (1765). 12. Peg Woffington on cane-handle (c. 1760). 14. Scent bottle: a pink (c. 1754). 15. Seal: squirrel. 16. Statuette in Chinese style (c. 1759). 18. Vase (c. 1763). 21. Hen-harrier. 22. Vase (1765). Also the entry China.

subsequent indorsee can have no better title to the cheque than the person from whom he received it. Thus if such a cheque is stolen or obtained by fraud, the holder cannot recover on it, even though he took it in ignorance of the theft or fraud and for value.

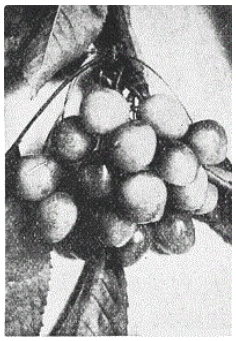
Always present a cheque the same day it is received if possible. A banker is bound to honour (i.e. pay) a customer's cheques drawn on him so long as he has money enough in his account. If the bank dishonours a customer's cheque when there is money to meet it, the customer can recover damages, which may be very heavy if he is engaged in trade or business.

Cheroot. See Cigar.

CHERRIES: THE FRUIT AND ITS VARIETIES
With Methods of Preparing Them for the Table

See articles on other fruits, e.g. Apple; Plum; and for cultivation Grafting; Pruning, etc. Other uses of cherries are described in the shorter entries that follow this main heading.

The cherry tree flourishes best on well drained land, on a subsoil of sand or chalk; there, in time, it develops into a large tree and is long-lived. It may, however, be grown on ordinary soil that is well cultivated. When cherries are planted in small numbers in gardens the difficulty of protecting the fruit from birds has to be considered, for unless the trees are netted the birds will spoil the crop, For this reason amateurs should plant bush or pyramid trees in preference to standards which take up a lot of room and cannot be netted conveniently.





Right. Cherry. clusters of small red morello cherries, much used in cooking. Left. Large bunch of white hearts.

Another detail of importance is this: all varieties of cherries are considered to be self-sterile and unless several are planted together the blossoms will not be cross-fertilised, and thus the chances of a successful crop are remote. For this reason it is useless to plant solitary cherry trees unless there are a number of others in the immediate neighbourhood.

The matter is complicated by the fact that some varieties of cherry are inter-sterile, that is to say, the flowers can be cross-fertilised only by certain other varieties.

The result of experiments has been to classify most varieties into six separate groups: those in one group will not cross-fertilise others in the same group, but they will cross-fertilise those from any other group. When making a choice of varieties, therefore, it is wise to choose one from each of the following groups rather than two from the same group.

A. Knight's Early Black, Black Eagle, Early Rivers and Bedford Prolific. B. Frogmore Bigarreau, Bigarreau de Schrecken and Waterloo. C. Emperor Francis and Napoleon. D. Governor Wood and Elton. E. Kentish Bigarreau.

Other cherries are less difficult of management, and if a mixed collection is planted satisfactory crops may be expected. Among them are Noble, White Heart, Black Heart, Florence and Geant d'Hedelfingen.

Bush and standard cherry trees are grown in the open garden, standards at 30 ft. apart, bushes at 12 ft. apart. Fan-trained trees are suitable for planting against a wall facing south, west or east: they should be 18 ft. apart.

The sweet cherries, which comprise all those varieties named above, bear their fruit chiefly on spurs—short, sturdy shoots bearing blossom buds. The principal pruning is done in early August when summer laterals or side shoots which are likely to crowd the tree are stopped at about six leaves from the base. These shoots are again shortened in winter.

As cherry trees become older fruit spurs usually form freely and little pruning is needed. In fact, severe pruning does harm and may lead to an attack of "gumming."

Standard cherry trees need less pruning than bushes or pyramids; the branches are thinned out in autumn to prevent overcrowding. The growth of cherry trees on a wall must be limited and the summer and winter pruning of the side shoots is necessary. Cherry trees which grow luxuriantly but do not produce fruit should be lifted and root pruned early in November; that is a better practice than pruning the branches severely.

The morello cherry, which is so valuable for cooking purposes, flourishes best on a west or north wall. It needs quite different pruning from the sweet cherries. This takes place in late summer as soon as the fruit is gathered, and consists in cutting out parts of the old shoots to make room for those of the past summer's growth.

Pests and Diseases. Black fly usually infests the leaves of cherry trees in early summer. They should be sprayed frequently with an insecticide immediately the pest is first seen. Gumming is a malady which is difficult to deal with. Its presence is indicated by an exudation of a sticky gum-like substance from the branches. Planting in wet, heavy, ill-drained land and severe pruning are pre-disposing causes. If the silver leaf disease, recognized by the silvery grey appearance of the leaves, attacks a cherry tree it ought to be uprooted and burnt.

How to Cook. The cherry, whether it is fresh, preserved, or crystallised, is a favourite fruit with cooks, and may be used in a variety of ways. It is best

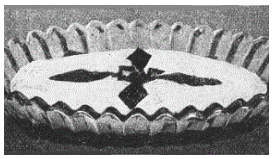
stoned before being cooked. If a cherry-stoner is not at hand, the fruit may be stoned by pushing a smooth, thick quill through each cherry from the stalk end. In this way the stone is pushed out and the fruit left intact.

To stew cherries, let them simmer gently until tender in an enamelled pan or casserole, with, to every pound of fruit, ½ pint water and 1½ tablespoonfuls sugar.

Stuffed cherries make pretty dessert sweets, and are prepared by rolling some almond paste into neat little balls, making a slit in the cherries, and inserting a ball in each. The cherry is then rolled in the hand to make it round, sprinkled with castor sugar and put into a tiny paper case.

Owing to their decorative appearance, cherry sweets are liked for parties. Cherry jelly is a favourite. To prepare this, wash and pick 1 lb. cherries, remove the stones, and put the fruit in a saucepan containing ¾ pint water and 6 oz. sugar. Simmer these until the cherries are tender, then strain and add water to make up to the original quantity. Put in the strained juice of half a lemon, together with ¾ oz. gelatine, and stir the whole over the fire until the gelatine has dissolved.

Strain all the juice into a basin, and when it is cold and nearly setting, add enough cochineal to produce a pretty pink colour. Put the cherries into a glass dish, pour the liquid over them, and then leave the jelly to set in a cold place. This may be decorated with cream, angelica, crystallised violets and cherries. A good blancmange for children's parties is made from a quart of milk, 4 oz. each cornflour and cherries, 6 oz. sugar, and a little vanilla essence. Put the milk into a sauce-pan and boil it, then add the cornflour mixed to a smooth paste with a little extra milk. Keep the whole over the fire until it thickens, and cook it very gently for 5 to 8 min., stirring all the time, then add 4 oz. sugar and a few drops vanilla essence.



Cherry Jelly, covered with cream and ornamented with pieces of angelica.

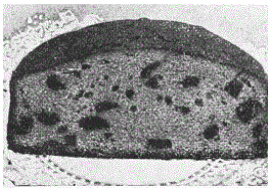
Stew the cherries in sufficient water to cover them until they are tender, adding another 2 oz. sugar. Rinse a mould with cold water, and arrange a few of the cherries at the bottom; then pour in some of the cornflour mixture, and lastly the rest of the cherries mixed with the remaining cornflour. Leave the blancmange to set.

Another decorative party dish is made from 1 lb. cherries, 3 gills water, the juice of ½ a lemon, 4 oz. sugar, ¾ oz. gelatine, 1 gill cream, and a little cochineal or carmine. Remove the stalks, wash the cherries thoroughly, and then cut them into halves and take out the stones. Put them in a pan with the water, sugar, and lemon juice, and simmer the whole until tender. Then strain off the juice and measure it, and if it is less than 3 gills make up the amount with water, afterwards putting it into a pan with the gelatine, and stirring it over a slow heat until it has quite melted.

Add a few drops of cochineal or carmine, put the cherries into a border mould rinsed out with water, and strain the juice over them, leaving the whole in a cold place to set. Turn out into a glass dish, and fill the centre with whipped cream, sweetened and flavoured with vanilla., A few whole cherries may be placed round the top of the mould.

CHERRY BRANDY. This is a cordial which is good when home-made and when the best materials are used.

A simple method is to fill a bottle ¾ full with cherries, not overripe and using half morello and half black cherries; pour in brandy to the neck, cork it up well, and let it stand for a month. *See* Brandy.



Cherry Cake, cut in half to show the glacé cherries and candied peel with which it is flavoured.

CHERRY CAKE. By those who do not care for currants cherry cake is generally appreciated. To make it, sieve together ¾ lb. flour and 2 level teaspoonfuls of baking-powder. Beat ½ lb. butter or margarine and the same quantity of castor sugar to a soft cream, using less butter if a plain cake is desired. Into this mixture whisk 3 beaten eggs, then fold in the flour lightly, adding 1 oz. chopped candied peel and 2 to 3 dozen glacé cherries cut into halves or quarters and well floured. Stir in about 3 tablespoonfuls milk, and bake the cake in a tin lined with greased paper in a moderately hot oven for about 1 ½ hours. This mixture might also be baked in small fancy patty pans for about 20 min. *See* Cake.

CHERRY CIDER. The ingredients required are ½ lb. stoned, ripe cherries, a pint of boiling water, and a thin piece of lemon rind. Bruise the cherries, pour the boiling water over them, and then add the lemon rind. A few bruised cherry-stone kernels will be found to improve the flavour greatly. Soak the fruit in this way for 4 or 5 hours, then strain and sweeten the liquor with 2 oz. of sifted sugar before bottling it.

CHERRY JAM. As it is deficient in pectose, the substance that forms jelly, jam made with cherries requires the addition of apple or red currant juice to make it set. To each lb. of sound fruit allow ¾ lb. of sugar, 1 gill of red currant or apple juice, and two shredded sweet almonds. Put the sugar and the fruit juice in the preserving pan, and let it dissolve slowly by the fire.

Boil the mixture for 5 min., add the ripe, sound fruit, removing the stalks and as many stones as possible, and lastly add the shredded almonds. Boil the jam gently until the fruit is tender, and the juice jellies when tested on a plate. Keep it well stirred and skimmed during the boiling. When cooked, pour off into dry, warmed jars, and tie down at once.

Cherry Laurel. *See* **Laurel.**

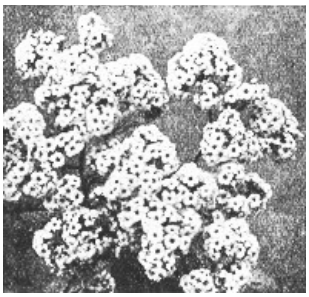
CHERRY PIE or Heliotrope. A non-evergreen shrub with fragrant lilac-coloured flowers, the cherry pie or heliotrope grows fast from seed sown in heat towards the end of winter, and can therefore be used in beds the same season. The seed may be sown in a box or pan put in a warm glasshouse in February, and the plants pricked off and hardened in a cold frame, then planted out in June. Any fertile, friable garden soil suits them.

Cuttings can be made of the young shoots in spring, inserted in sandy soil and placed in heat. Curing the winter the plants need very little water, but must be given air.

Young plants bought in small pots in June should be planted in a sloping position about 18 in. apart, and the side shoots pegged down from time to time as they extend.

The greenhouse culture of cherry pie is easy. A suitable soil consists of loam with a quarter of leaf-soil, a quarter of spent hotbed manure, and a fair amount of sand. Propagation is either from seed or by cuttings of the young shoots in spring.

When planted on a warm greenhouse border, cherry pie will very quickly cover considerable space on a wall, and it will scent the whole house. All the attention it will need will be judicious watering, periodical tying-in, and occasional pruning. Standard plants can be secured by depriving the main stems of strong plants of all lateral shoots, and growing on until the plant has reached the requisite height.

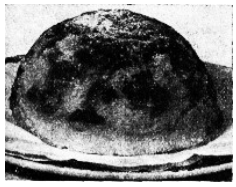


Cherry Pie. Plant of heliotrope, of the Miss Nightingale variety, in full flower.

The following are some of the best varieties: Miss Nightingale, violet blue; Rose Glair, dark blue; White Lady, palest blue; President Garfield, mauve-purple; Lord Roberts, dark blue; and The Speaker, violet-purple.

CHERRY PUDDING. To make an ordinary cherry pudding, grease a small pudding-basin, sprinkling on the bottom of it a thin layer of brown sugar to form a caramel, and lining the basin with a good suet crust. *(See* Apple Pudding.) Remove the stones and stalks from 1 lb. cherries, and fill the basin with them, adding 2 or 3 tablespoonfuls of sugar. Pour in a little water to moisten the fruit, and then cover it with a layer of suet-crust. Bake the pudding in a moderate oven for 1½ hours, and turn it out of the basin before serving.

Cherry Sandwich Pudding. This is made by parboiling 1 lb. of black cherries in a syrup made by boiling 3 oz. granulated sugar in a saucepan, with a gill of water.



Cherry Pudding. A baked caramel-covered pudding made with cherries and suet crust.

When the cherries are tender, drain them, and reserve the syrup. Then beat 5 oz. margarine and the same quantity of sugar to a cream, add a pinch of ground cinnamon and the beaten yolks of 2 eggs, and stir in 5 oz. breadcrumbs, 4 tablespoonfuls of milk, and the stiffly whisked whites of the eggs. Put a layer of this mixture in a greased pie-dish, and on this place a layer of cooked cherries, then some more mixture, and so on until the dish is full., Bake in a hot oven for ½ hour, then turn it out on to a hot dish, and pour the syrup over it.



Cherry Sandwich Pudding served with the syrup resulting from parboiling the cherries.

CHERRY WOOD. One of the chief uses for the wood of the cherry tree is in making tobacco pipes. It is valuable also for turned and fancy articles, and in small cabinet work. The colour of cherry wood is brown with a reddish tinge; it has a smooth and fine grain, easy to work, and takes a good polish. It is hard, but not very durable as it splits rather easily. *See* **Pipe.**

CHERVIL. The kind mostly grown is the common chervil, the aromatic leaves of which are used for salads and garnishes, particularly those of the curled variety, which are more crisped. The chervil is an annual, and thrives in any ordinary soil, producing leaves fit for gathering in about two months from the time of sowing. It may be sown successionally from March onwards, and thinned to about 6 in. apart.

CHESHIRE CHEESE. Both as regards texture and flavour, Cheshire cheese possesses distinct characteristics, for while it is very open-grained it is yet mild, soft and full in flavour. It is perhaps the softest of the hard-pressed varieties. There are three types of Cheshire cheese, known as early ripening, medium ripening, and slow ripening. The cheese may also be coloured or uncoloured. *See* **Cheese.**

CHESS: THE PIECES AND THEIR PLAY

First Principles of an Ancient Game

The game of chess is played between two opponents, moving in turn, on a board of 64 squares, arranged in 8 rows of 8 squares each. These squares are coloured alternately white and black (at times other colours, but always conventionally called white and black); and there must always be a white square in the corner to

the right of each player. The opponents have 16 men each (also known as white and black) on the two rows of squares nearest to them, namely 8 pieces on the back row and 8 pawns on the row just in front. This is the position when a game starts.

The pieces on the back row are of five different kinds. The king and queen stand in the centre, the queen being on a square of her own colour; a bishop next each of them; a knight next each bishop; and a rook (or castle) next each knight. The pieces on the king's side of the board are known as king's bishop, king's knight, king's rook; the pieces on the queen's side of the board as queen's bishop, queen's knight, queen's rook. The pawns, who occupy the next row to the back one, are called after the pieces standing behind them—king's pawn, king's bishop's pawn, commonly written KP, KBP, etc.

The notation of the chess board that is current among English-speaking peoples is derived from the names of the pieces, each vertical row, or file, being called after the piece standing on it. Thus, in Fig. 2, white's extreme left-hand file is the queen's rook's, or QR, file. The squares on which the pieces originally stand are QR1 (or QR square), QKtl, and so on; the squares on the next horizontal row, or rank, are QR2, QKt2, and so on. From black's standpoint the figure is reversed, so that his Q side pieces are to his right, his K side pieces to his left. A move is recorded, in this notation, in the form K—K2, Q—QR4, P—K3, etc., indicating both the man moved and the square to which it moves.



Chess. Fig. 1. Board set out with men placed in position ready to start the game.

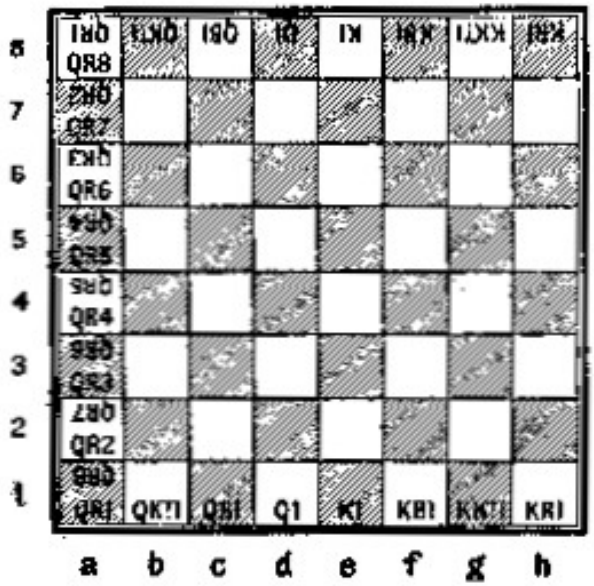
The theoretical object of a game of chess is the capture of the hostile king, which brings the game to a close When the king is liable to be captured on the opponent's next move, he is said to be in check; and if he cannot move out of check, he is said to be mated, and the game is over. Now and again situations arise where neither king is mated and the game has no decisive result.

All the chessmen alike capture an opposing man by being put down on the square occupied by that man, which is then removed from the board; but there is a considerable variety in the nature of their moves. The king has the shortest and simplest move, being one square only in any direction—horizontal, vertical, or diagonal. In Fig. 3, supposing the king stands on the square marked X, he can move to any of the dotted squares immediately surrounding it. As he cannot be captured, however, without ending the game, it follows that he cannot move into check and cannot stand on a square next the opposing king.

The queen's move is a prolongation of the king's move in each direction up to the edge of the board. Standing on X, she can go not only to each dotted square, but also to any of the squares along the arrows shown in Fig 3. The rook has the horizontal and vertical moves of the queen, but the bishop has her diagonal moves only.

Neither queen, rook, nor bishop has the power of jumping over a piece, whether friendly or hostile. The knight, on the other hand, can. The knight's move may be roughly described as one square in a horizontal or vertical direction, followed by one in a diagonal direction away from where he previously stood. Thus, in the left-hand section of Fig. 4, if the knight stood at X, he could move to any of the dotted squares in a circle round it, regardless of whether the squares immediately next him were occupied by friendly or hostile men. From this jumping power of the knight it follows that in the original position of the men (Fig. 1) the knights alone of the pieces can move, the others having to wait until the pawns have been moved.

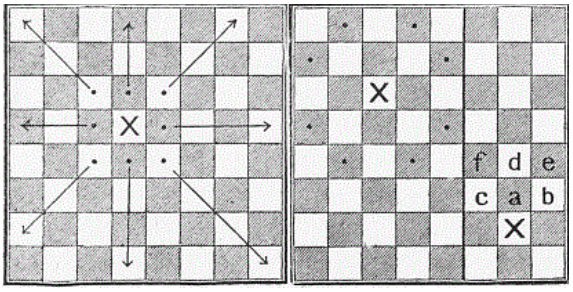
The pawn's ordinary move is one square forward in a vertical direction. It does not however, capture an opposing man in this way, but by a move one square forward diagonally. Thus if a pawn stands at X in the right-hand section of Fig. 4, its ordinary move is to a, its capturing moves are to b or c. On its first move in the game each pawn has the privilege, at the player's option, of a double move, i.e to d in the diagram. Both the single and the double move of the pawn are dependent on the absence of any obstruction in the path. There is also another limitation to the double move. If, in the diagram, a hostile pawn (but only a pawn, not a piece) stood on either of the squares marked e and f, then, in spite of the fact that a pawn on X moved to d, the hostile pawn could capture it on a, before it reached d. This is called taking en passant, or in passing. On reaching the further side of the board in safety, a pawn becomes promoted to queen, rook, bishop, or knight, at the option of the player.



Chess. Fig. 2. Notation of the board usually adopted for describing moves in the game.

The move known as castling is a joint move of the king and one of the rooks. It can only occur once in the game on each side, and then only if neither king nor rook has moved previously and no piece stands between them. This operation consists in bringing the rook up to the near side of the king, and simultaneously jumping the king over the rook to the square next beyond him. In this the king may not pass over a square where he would be liable to capture.

In power the queen is easily first; the rook is second, the bishop third, but only a little, and that not always, above the knight (which in certain positions, indeed, is the more powerful of the two pieces); while the pawn is the weakest of the chessmen, with the exception that its potentiality of promotion even to a queen gives it a force much above its normal. In the absence of a queen on the board, a pawn which cannot be prevented from queening is obviously most powerful as compared with the remaining pieces. Owing to the peculiar feature of the king, whose capture would end the game, his value cannot well be estimated.



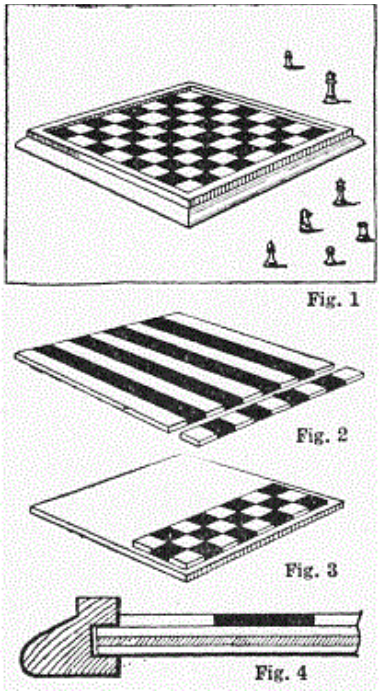
Chess. Fig. 3. Diagram showing possible moves of king, queen, rook and bishop from X. Fig. 4. Left, moves of a knight; Right, those of a pawn.

Types of Opening. There is no royal road to the openings at chess; and, though there are many excellent text-books, it is of little use to learn by heart the variations which they give, without understanding the principles of sound development. Now development means getting the forces into play where they will (1) have increased powers and (2) restrain the powers of the enemy's forces. The advance of the two central pawns releases both bishops and the queen. The knights can come out independently of the pawns, and so the way is cleared for the rooks to operate in the centre, the king being got out of the way by castling. Thus we might get such a system of developing moves for one side as P—K4, P—Q4, Kt —KB3, Kt—QB3, B—QB4, B—KB4, castles, Q—K2 (or Q2), QR—Q1, KR—Kl, when every piece would be developed. But clearly both sides could not deploy their forces thus without coming into direct conflict in the centre of the board. The alternation of moves between the two must modify the development. A typical opening is brought about as follows: 1 P—K4, P—K4; 2 Kt—KB3, Kt—QB3; 3 B—B4, B—B4; 4 P—Q3, P—Q3; 5 Kt—B3, Kt—B3. This is a variation of the opening known as the Giuoco Piano, or Slow Game. It is optional now for both sides to castle, to bring out the Q and QB, and to move both rooks into the centre; but such procedure would not necessarily be the best.

A very different type of opening is seen in the various gambits. A gambit implies the sacrifice of a pawn, and sometimes more, in the opening. Here, for instance, is the Muzio Gambit, as illustrated in a game played by Morphy at the age of 20: 1 P—K4, P— K4; 2 P—KB4, P x P (i.e. P takes P); 3 Kt—KB3, P—KKt4; 4 B—B4, P —Kt5; 5 Castles, P x Kt; 6 Q x P, Q—B3; 7 P—K5, Q x P; 8 P—Q3, B—R3; 9 Kt—B3. White has given up a knight and a pawn for the sake of quick development and a very threatening attack, against which any slip by Black may lead to disaster.

Nowadays neither of these forms of the opening is in favour with the leading masters at chess; but they serve best as examples of two extremes in opening tactics. Modern practice devotes more attention to what are known as the queen's side openings, beginning with 1 P —Q4, instead of 1 P— K4; while among the king's side openings the Ruy Lopez (beginning 1 P—K4, P— K4; 2 Kt—KB3, Kt—QB3; 3 B— Kt5) retains a popularity which it has had for nearly half a century. Both of these methods of commencing the game are somewhat intricate. J. H. Blackburne recommends for the beginner the Scotch game (1 P—K4, P—K4; 2 Kt—KB3, Kt—QB3; 3 P—Q4, P x P; 4 Kt x P). The openings are intended to put the player in a good position for the middle game which, is the principal part of a chess match.

CHESS BOARD: How to Make. Fig. 1 shows a chess board which can be inexpensively made. The base of the board should be of three-ply wood surrounded by a fairly bold moulding; the base is rebated into the moulding, and the latter is mitred at the corner, while the face of the board is covered with the chequered playing squares.



Chess Board. Figs. 1-4. Diagrams of board completed and in process of making.

With the playing space formed with 1½ in. chequered squares the base will be 1 ft. square, in addit-ion to which allowance must be made for rebating the base into the mould-ing, so that the piece of three-ply wood required for the base must be 12½ in. square, and it should be about ⅜ in. thick. The playing space consists of eight rows of chequered squares with eight squares in each row, sixty-four in all. Half of the

squares must be cut from a light wood, and the other half from a dark wood. Holly and ebony will give the best effect.

To cut the chequered squares accurately and quickly, provide five strips of light wood, about 14 in. long by 1½ in. wide by ⅛ in. thick, and four dark strips of similar dimensions. The strips should then be glued up in the order shown at Fig 2. After the glue is dry, one end of the glued-up strips should be cut quite square, and from it eight strips 1½ in. wide are cut, from which the complete playing space may be formed. The chequered strips are fixed to the base with glue as shown at Fig 3, care being taken to glue the edges of the strips together as well as to glue the strips to the base. When the chequered strips are arranged correctly it will be found that there will be a surplus light square at one end of one strip and at the opposite end of the next strip, and so on, but these must be removed before the strips are glued to the base.

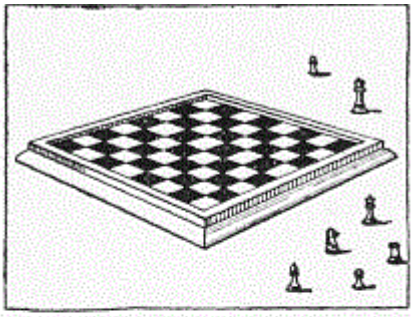


Fig. 1

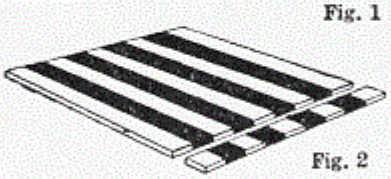


Fig. 2

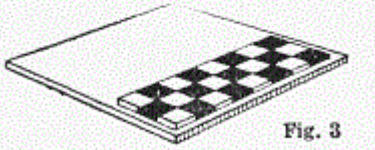


Fig. 3



Fig. 4

The moulding, which is mitred around the base, should be 1¼ in. wide by 1 in. deep, and of a section similar to that shown at Fig. 4. Mahogany could be used for the moulding, and a piece of the section shown could be very easily worked by hand A rebate or a groove is cut in the inner edge of the moulding, into which the base fits; the corners are mitred, and the moulding is fixed with glue. The best method of finishing the board will be by french polishing.

CHEST: In Human Beings. The important part played by the chest is sufficiently indicated by its position and the organs which it contains. Ailments of the chest are of common occurrence and injuries to it may involve the lungs or the heart, and call for surgical treatment.

In men chest measurement is regarded as a test of strength and stamina. Recruits for the army and navy, for example, must reach a certain standard in this respect. The chest measurement in most men varies from 33 to 40 in.

This region may be the seat of aneurism and of various tumours. Injuries of the chest may be slight and have no worse consequence than a bruise or a broken rib; or they may be severe and result in damage to the lung, the heart, or the covering membranes. All severe injuries require the attention of a surgeon. Until he arrives it is important that the patient should be kept warm, and in a state of complete rest.

First aid consists in tying a broad-fold triangular bandage round the chest, the middle of the bandage being placed over the broken ribs. A similar bandage is then applied overlapping the first above or below, depending on the site of the fracture. A broad strip of flannel or a soft towel may be used instead, and these are fastened with safety-pins. The object is to restrict as far as possible the movements of the chest, but it is important that the bandage should not be firm enough to hurt.

Probably the most common cause of pain in the chest is flatulent indigestion, and this often erroneously leads the sufferer to believe that his heart is affected. It is a mistake for anyone to try to make his own diagnosis. The explanation of the cause of such pain must come from the doctor; in the meantime the patient should be placed at rest in the easiest position, and hot fomentations or a hot-water bag applied over the painful area.

Care Of the Chest. Besides indicating a good physique, a deep, well-expanded chest is a help to wearing clothes with distinction. Chest development by proper breathing can be augmented by the following exercises:

1. Stand with head bent forward, shoulders and arms relaxed; raise arms sideways and straighten back, letting the head go back with mouth open. The effort of the movement is concentrated *between* the shoulder blades, and the expansion of the chest. Repeat 6 times.
2. Kneel and sit back on heels with hands clasped behind, head well back and chest expanded. Still keeping head well back, bend the upper body forward until the chest almost touches floor in front of knees. Then relax upper body completely. Gradually straighten the back, the chest and head being the last parts to be completely raised, and finish with chest well expanded.

Exercise with a bamboo cane held behind the shoulder blades is helpful, especially if seated tailor fashion on the floor, as this position renders it impossible to hollow the back, and the shoulders must do their proper work in helping chest expansion. Send the cane to the right by straightening the right arm, and then to the left by straightening the left arm. Then raise the cane with both hands over the head and bring down to first position. *See* Adenoids; Bandage; Breathing.

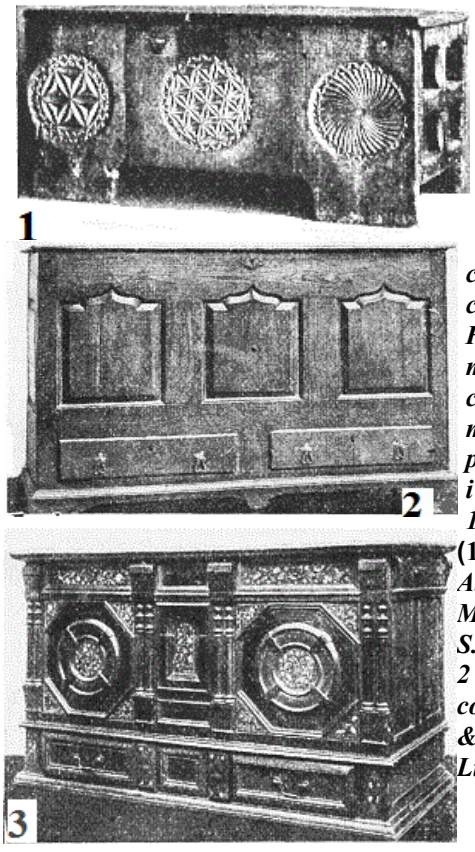
CHESTS: ANTIQUE AND MODERN PIECES
Information of Value to both Connoisseur and Woodworker

The reader may usefully consult the many entries that give practical advice to the amateur woodworker, e.g., Amateur Carpentry; Cabinet; Cabinet Making; Joint; Mortise

The chest is a development of the box, being really a large box with a hinged lid. In addition to their obvious use for holding clothing and other personal and household possessions at home and when travelling, chests were often, in the Middle Ages, used as seats.

These chests, however magnificent, were essentially boxes, but later they were raised from the ground by the addition of feet, and were used less than formerly for travelling purposes. Some were beautifully carved and ornamented with heraldic designs. Another class of chests, known as tilting coffers, were carved with representations of tournaments, or with figures of mythical monsters or heroes of chivalry. Examples are in the Victoria and Albert Museum, S. Kensington.

Existing antique chests are chiefly of the 16th, 17th and 18th centuries, although there are a few of even earlier date, at which time they were a common article of furniture, serving the purpose of cupboards. Some of them were marriage chests, of which there are magnificent examples inlaid with ivory and precious woods. English chests of the 17th century have often panelled fronts and sides, and are ornamented by carvings.

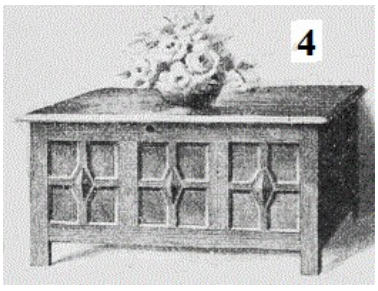


Chest: three antique examples. 1. Oak chest, English, 13th century, from a church in Hampshire. 2. Late 17th century oak coffer. 3. Heavily moulded oak chest, inlaid mother-of-pearl and ivory, dated 1660. (1. *Victoria & Albert Museum, S. Kensington;* 2 *and* 3. *courtesy of Gill & Reigate, Ltd.)*

In many, architectural detail, especially of wainscoting, was followed; thus earlier chests were carved in linenfold pattern, while the Jacobean chests often reproduce the pilastered and recessed oaken mantelpieces of that time. The three antique chests illustrated are of oak, the wood chiefly used for them in the 16th and 17th centuries and earlier, while mahogany and walnut were the woods selected for chests in the 18th. Fig. 1 is a finely carved specimen of English work, dating from the 13th century. Fig. 3 is a beautiful piece of work. This oak is heavily moulded and is inlaid with mother-of-pearl and ivory. Fig. 2 is a coffer of late 17th century make showing a plainer style. It will be noticed that it is well raised on feet, and also that in the lower part are two drawers, marking the development to chests of drawers (q.v.) which then were ousting the box chests.

Making a Chest. Fig. 4 shows a chest which can be made by the amateur, and will be suitable for the hall or for a dining room. The wood should be oak, stained to a rich nut-brown colour and oiled, waxed, or french polished to harmonise with the surrounding furniture. In a quieter way some suggestion of an old effect can be obtained: by finishing with red polish mixed with a small quantity of vegetable black. Those who prefer to make use of some other wood may be able to serve their purpose with birch or American whitewood, or something might be done with satin walnut, ash, or pine as substitutes. The length of the top is 4 ft. 3 in. by 1 ft. 10 in., and height over all a full 2 ft. Size of box is 4 ft. by 1 ft. 9 in. net. An elevation sketch of front and of end is shown at Fig. 5, and should be taken in conjunction with the sketch of parts at Fig. 7. The uprights (A) should finish 2 ft. by 3 in. by 3 in. if to be fitted as posts, but this part is frequently met with finished to a thickness of 1¼ in. to 1½ in. net. They will be mortised for tenons on front rails to enter well home and be pinned, and the corresponding rails on ends are entered in a similar manner. Between the mortises the uprights are grooved for panels ½ in. deep. The faces of uprights and rails (shown plain in Fig. 4) are often treated with scratch beads (Fig. 5).

The top rail (B, Fig. 7) is fitted from a piece 4 ft. by 4 in. by 1⅛ in. or ⅞ in., to be grooved for panels and for the entry of the inner uprights. It has shouldered tenons at each end. The bottom rail (C) finishes 3 in. by 1⅛ or ⅞ in. The two inner uprights (D) take pieces 1 ft. 4 in. to finish 3 in. by 1⅛ in. or ⅞ in., and are stubbed to rails top and bottom. The three panels (E) are allowed a size of 1 ft. 4 in. by 1 ft. 2 in. by ⅝ in. net for fitting. These may be treated as plain or bevelled.



Chest. Fig. 4. Simple dining room chest which can be made by following the instructions given. *(For details see page 415)*

The detail for the panels shown in Fig. 4 is one that is easily mitred up of ¾ in. mould.

The two upper end rails (F) are fitted from pieces 1 ft. 9 in. by 4 in. by 1⅛ in. or ⅞ in. The bottom rails (G) finish 3 in. wide to agree with the front. Both are tenoned to uprights and pinned with panels grooved in, taking 1 ft. 9 in. by 1 ft. 4 in. by ⅝ in. net. The back is rebated into position behind and screwed. It can be made up of three boards with the grain reversed and

glued up, or (preferably) tongued and glued, using hardwood tongues. The bottom is pieced up in the same manner and rebated to enter housings in front and ends. It may either be screwed or glue-blocked under.

The lid should be tongued together, if made up of lengths to the required width, 1 ft. 10 in.; a lining (Fig. 6) screwed on under can lap over the top edges of box at front and ends and serve as a stop for drifting dust. The top, however, is best framed up in the manner indicated with three panels at Fig. 8. For this the stiles (H) take two pieces 4 ft 3 in by 3 in. by ⅞ in., and rails (J) four pieces 1 ft. 8 in. by 3 in. by ⅞ in. to be mortised and tenoned together and pinned or wedged. The framework is also grooved for the panels to be fitted flush, Fig. 9, allowance for panels being 1 ft. 6 in. by 1 ft. 3 in. by ⅝ in. Fig. 13 shows fitting of back, and Fig. 14 the jointing of front and end panels to posts and inner uprights. *(For working drawings see page 415)*

A Simple Stand. Those who would prefer to raise the chest above the ground, in order that the top may form an attractive side table, may construct a stand similar to that indicated at Fig. 10. The idea is useful, too, for anyone already in possession of a chest of which the lower part is dilapidated, or where the plinth or legs have been shortened, making the whole thing rather squat. Such a stand can be 12 in. high, and made with a wel top, so that the chest may drop in snugly. Details for making this stand with secure joints for the rails and legs, are shown in Figs 11 and 12.

Legs (or uprights) take four pieces 12 in. by 1½ in. by 1½ in., or may be finished 1⅞ in. if preferred. They may stand four square on the ground, but are indicated at Fig. 10 as with 2 ¾ in. flat ball feet dowelled in, of the type known as bun shape. The rails can be allowed 4 ft. 3 in. by 3 in. by 1½ in. for front and back, and 1 ft. 10 in. by 3 in. by 1⅛ in. for ends, to be dovetailed into uprights and be stiffened with braces in the angles as at Fig. 12. The brackets under provide some little finishing effect. They can be cut 3 in, by 3 in. by ⅞ in., to be dowelled and screwed into position. The mould, forming a lip edging, behind which the chest (less its legs) will bed, can be a 1¼ in. by ¾ in. section, glued and screwed as shown in Fig. 12. The cutting list is given in the previous page.

THE CHEST OP DRAWERS

Construction, Renovation and Small Repairs

See further Cabinet; Drawer; Dressing Table; Tallboy; Wardrobe; also the preceding article Chest, and the entries dealing with the methods of the amateur woodworker

A chest of drawers is in essence a chest into which drawers have been fitted. For it the chest in ordinary use was made larger and the front cut away to admit the drawers.

The early chests of drawers were of oak, and of walnut, veneered on oak or pine, dating from the time of William and Mary and Anne. The beautiful effects of the drawer-fronts were obtained by cutting and laying the wood in various directions. Later in the 18th century mahogany became fashionable for these chests, and many fine specimens are in that wood. They are made by Sheraton, Chippendale and other great designers.

Of the two illustrations of antique chests given herewith, the first is of pine and oak veneered with walnut and lignum vitae. It follows the conventional style in having two small drawers and two larger ones in the upper part of the piece, but the bottom is more elaborate than is usually the case. The chest has there a further drawer, and the whole is supported on five beautifully carved legs, three in front and two behind, which in their turn rest on a plinth or stand. On each drawer are brass escutcheons and drop handles. The second is an example of Dutch work of about the same date. The supports of old chests of drawers vary. Some are supported on a plinth and carved legs respectively, but others rest upon short legs of a plainer kind.

A Man's Dressing Chest. The type of chest of drawers illustrated in Fig. 3 requires only a small space, and will be of special use to the man who likes a convenient glass for shaving. The chest is 3 ft. 6 in. high, having a useful set of drawers ranging from 4 in. to 7 in. deep. The glass is thus at a suitable height, and the whole article is not only neat and compact, but easily made by those who have an average amount of cabinet-work skill. Oak is the most suitable wood to use, or, if mahogany be preferred, the lower corner brackets should be left out and the leg portion tapered.

The four posts should be prepared first. These are 1½ in. square, and are mortised to take the side rails and drawer rails, the top front rail being dovetailed as in Fig. 6. This diagram shows the top portion of a front leg with the top removed, the view being taken from inside the job. The posts are grooved to take the side panels, and the back legs are also rebated for the back as in Fig. 5. The ends are glued together first and allowed to set before glueing the remainder. If the job is to be stained a dark colour, it is advisable to put a little stain round the edges of the panels, so that in the event of their shrinking no white edges will become visible. The top dividing drawer rail is stub-tenoned between the two top rails, and all the rails except the bottom are grooved to take the dust-boards, as in Fig. 6. The bottom one is rebated to take the bottom board, and is 1 in. thick. The drawer rails measure 2¼ in. by ¾ in., and the runners 1 ¾ in by ¾ in.

Having put the carcass together, the runners may be fixed. These are also grooved for the dust-boards, and are fixed at the front by stub-tenons fitting into the grooves of the drawer rails (Fig. 6), and at the back are screwed to the back posts around which they are cut. Note that these runners are in no way fixed to the side panels. To the tops of the runners the guides are screwed, being lengths of 1 in. squares, as Fig. 6 shows.

	Long ft.	Long in.	Wide in.	Thick in.		Long ft.	Long in.	Wide in.	Thick in.
4 uprights (A)	2	0	3	3 or 1½	Bottom	4	0	21	¾ or ⅝
1 front top rail (B)	4	0	4	1⅛ or ⅞	Lid	4	3	22	¾ ⅝
1 front bottom rail (C)	4	0	3	1⅛ or ⅞	Lining	8	0	¾	⅝
2 front inner uprights (D)	1	4	3	1⅛ or ⅞	Or,				
3 front panels (E)	1	4	14	⅝	2 stiles (H)	4	3	3	⅞
Mould	15	0	¾		4 rails (J)	1	8	3	⅞
2 upper end rails (F)	1	9	4	1⅛ or ⅞	3 panels (K)	1	6	15	⅝
2 lower end rails (G)	1	9	3	1⅛ or ⅞	Stand (if required)				
2 panels	1	9	16	⅝	4 uprights	1	0	1½	1½
Back	4	0	21	¾ or ⅝	2 rails (front and back)	4	3	3	1⅛
					2 rails (ends)	1	10	3	1⅛
					6 brackets		3	3	⅞ ¾
					Mould	9	0	1¼	
					4 ball feet, 2¾ in. diam		—	—	—

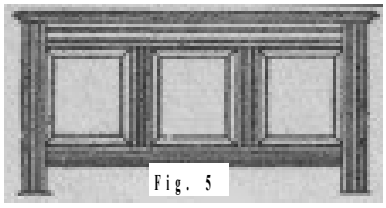
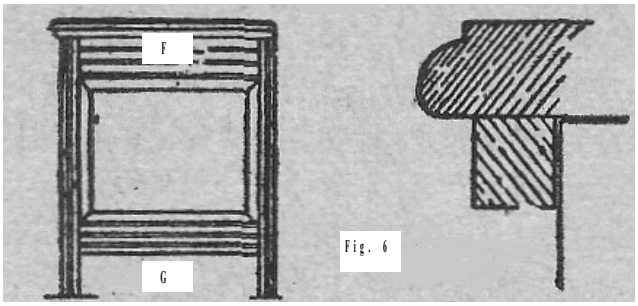
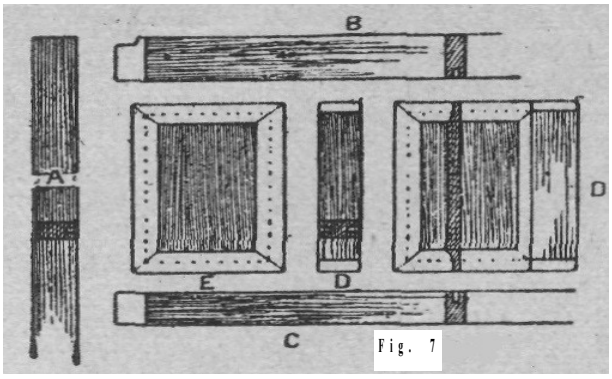
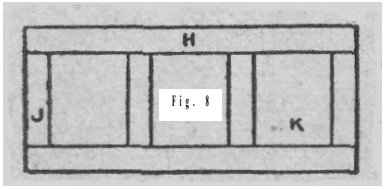
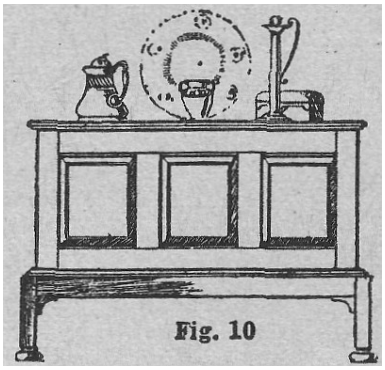


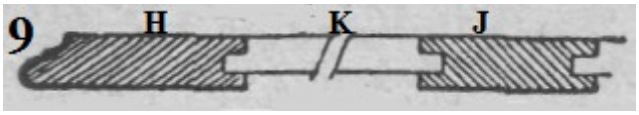
Fig. 5

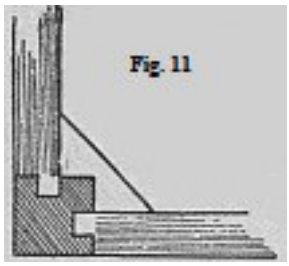


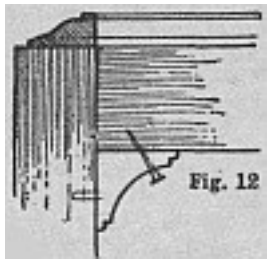


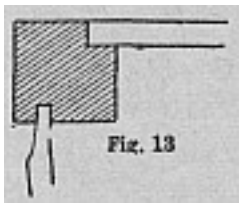


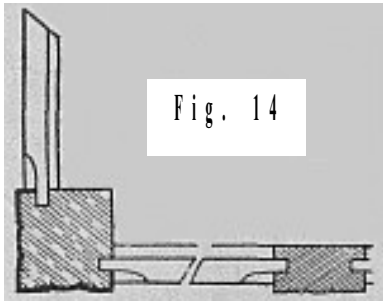












CHEST.

Figs. 5-14. Working drawings of the chest shown in Fig. 4.

How to Make the Drawers

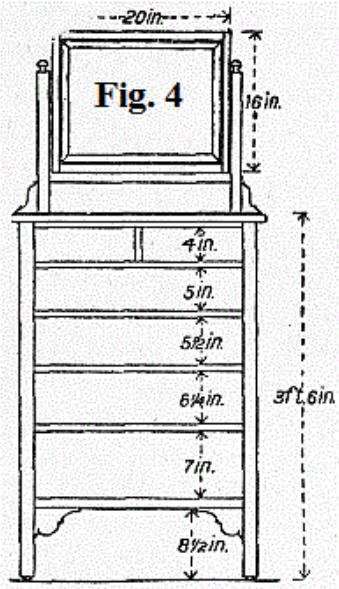
The drawer fronts finish ⅞ in. thick, and the sides and back 5/16 in., and all the parts are fitted separately to size. Fig. 7 shows the correct setting out for the dovetails. An important point to notice is that the groove for the bottom is contained within the lower dovetail, so that this will not show a gap when the drawer is together. The total width of the back measures from the top of the groove to the dotted line (Fig. 7), the top being rounded as shown. The bottom is fixed in a groove run along the drawer front, and at the side in grooved fillets with a rounded upper edge, as in Fig. 8; these are glued to the drawer sides. At the back, the bottom is screwed or nailed to the drawer back. It is usual to allow the bottom to stand out from the back, as shown, so that if the bottom shrinks the screws can be taken out and the bottom pushed forward.

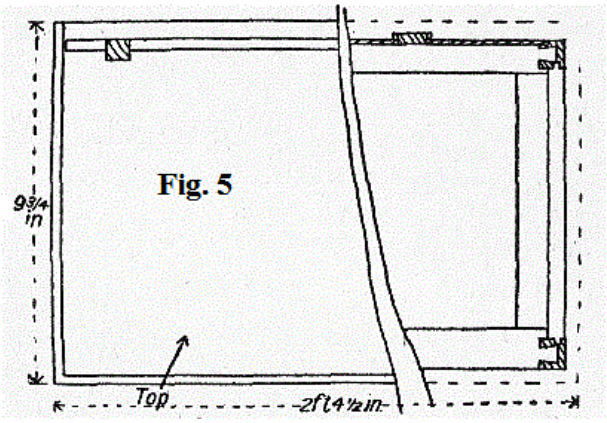
The top is moulded at the front and sides, and overhangs 1 in. at the back to allow for the wall skirting. It measures 2 ft. 4 in. long by 19 ¾ in. wide, and is fixed by screwing from underneath. The addition of the lower angle brackets (glued and screwed) completes the lower part of the chest. The mirror supports are 1⅛ in. square, and are tenoned into the top, the rail being dowelled into them; also the side brackets. The frame is mortised together and the glass fixed with wedges glued to the rebate (Fig. 9). The back board is screwed on, as shown. The glass swings on special brass movements made for this purpose. The handles of the drawers, if the job is in oak, should preferably be of the drop type.

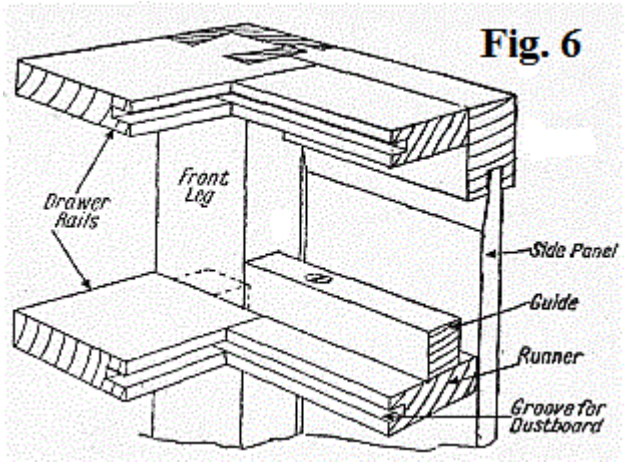
Converting a Painted Chest. An old painted chest of drawers such as that illustrated in Fig. 10 is to be found in almost every house. If the paint has become worn, a practical plan is to strip the paint off and mount the chest on a stand, decorating the drawer fronts with mitred mouldings, and thus producing an attractive Jacobean chest (Fig. 11).

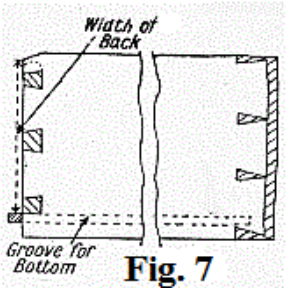


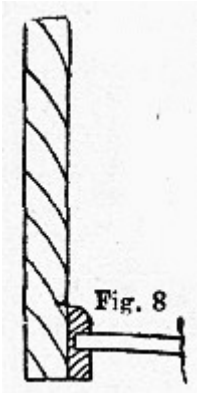
Chest of Drawers.
Fig. 3. Compact set for a man's room, the whole surmounted by a shaving mirror.
Figs. 4-9, Diagrams showing details of construction.

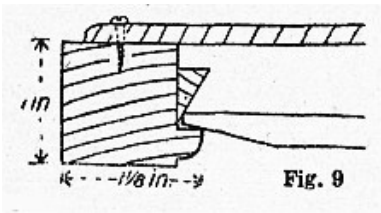












The plinth is usually attached with glue and nails, and strengthened underneath with corner blocks. These latter should be knocked off with a chisel before removing the plinth. The old handles, too, should be taken off. The paint should then be cleanly stripped off, using one of the well-known strippers. Every bit of paint should be got off, as when later the job is stained any paint left on would prevent the stain from taking.

Any necessary repairs may now be done to the chest, including filling in the holes left by the removal of handles, and the whole thoroughly glass-papered, finishing off with No. 1½. Mouldings can be purchased at a cabinet maker's store; either oak or deal is suitable. For the chest illustrated about 60 ft. would be required. Mark out on the drawer fronts the position of

the mouldings, and at the jutting portions glue on small slips of wood 3/16 in. thick, round which the moulding is mitred (Fig. 14). The moulding is glued and pinned, and care must be taken to remove all surplus glue. The drawer stops must be removed and fixed further back to allow the moulding to stand only slightly forward from the carcass of the chest.

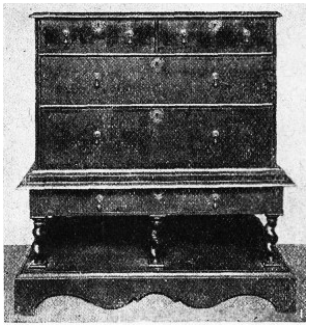
The stand may now be proceeded with. Allowance must be made at the front and two sides for the moulding shown (Fig. 13), inside which the chest stands. The stand is mortised together as in Fig. 12, using 2 in. stuff for the top rails and 1½ in. for the bottom rails. When this has been glued together and is quite dry, clean off the top and place the chest upon it in the required position, and fix the moulding round; this will ensure its fitting accurately. The moulding should be glued and pinned to the stand only, so that the chest is always free to be lifted off. The job is now ready for staining; dark walnut water stain is the best to use. Afterwards polish it with wax, and finally fix the brass drop handles.

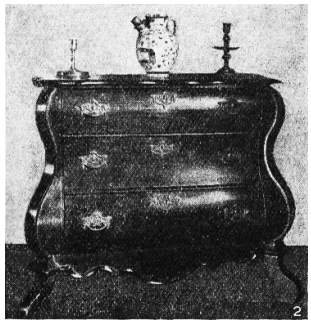
Repairing a Chest. The illustration (Fig. 15) is an example of an old mahogany chest of drawers of the general type that any amateur might be called upon to repair. The chest top is veneered with one sheet of mottled mahogany, the grain of which runs lengthways of the chest. The veneer is laid upon a yellow pine top (or core, as it is termed), and this top has clamped ends similar to a drawing board. The edges of the top are cross-banded by glueing on ⅜ in. solid mahogany strips, these being afterwards rounded off to give a finish to the work.

The carcass ends are of solid mahogany of the straight-grained variety, commonly called bay-wood. The front of the chest immediately under the top shows a wide bearer rail, veneered with mahogany curl veneers, jointed up to obtain the necessary width across the carcass front. The drawers have their fronts veneered with mahogany curls, and small projecting cock beads have been fitted into rebates at the ends, but are simply glued on to the top and bottom edges. The plinth or lower part of the chest has been made in a separate portion, screwed to the carcass.

One of the commonest repairs to an old chest of drawers is the renewal of a cock bead which has accidentally been damaged by splintering a piece out of the drawer, or the replacing of a small portion which has been broken during removal operations. Fig. 16 (A) shows a new length of beading made out of a piece of old mahogany. It is ready to be glued to the bottom, and its mitred ends have been cut and tried in position. The lower edge of the drawer should be carefully scraped to remove all trace of the old glue. The necessary pressure to hold the bead in position whilst the glue hardens would be obtained by using two handscrews or G cramps, which would span across the drawer front. The edge of the bead should be bodied up with french polish before fixing in position.

At the top edge of the drawer (Fig. 16 B) is shown the method of letting in a small piece of new wood to replace a bruised or damaged portion, where it is not thought desirable to fix a new bead on account of disturbing and re-fixing the lock, etc. The new piece is made to a dovetail shape and laid on to the existing bead: then a mark is scratched around it with a needle or sharp penknife point. This will give the exact size and angles of the new piece, and the recess may be sawn and carefully pared out with a chisel. The new piece should be made rather thicker than required, so that, after fixing, a shaving or two may be removed, thus leaving all flush. The top edge will then have to be glass-papered, stained and polished to the required colour.





Chest of Drawers. Left. Example of English design, made in the late 17th or early 18th century. It is of pine and oak, veneered with walnut and lignum vitae. Right. Antique Dutch chest of drawers, with bowed front (1, Victoria & Albert Museum, S. Kensington; 2, courtesy of Our Homes & Gardens)

Owing to constant friction, the lower edge of the drawer sides becomes worn away as indicated by the line drawn on the side of Fig. 16 (C). This allows the drawer to sag and throws the front out of truth with the face of the chest. This shows an unequal margin of the cock bead, and also causes the drawer to run badly. Drawers that have their lower edges badly worn should be turned bottom upwards on the bench and the worn portions planed away as indicated by the line at Fig. 16. The planing will not interfere with the drawer bottom, which stands clear of the lower edge of the side by anything from ⅜ in. to ⅝ in. A new piece, preferably of hardwood, is glued on to the existing drawer side and cramped in position. After, say, 24 hours, the surplus material may be planed off the newly-jointed piece, taking care to mark it out and make it parallel to the top edge of the drawer.

In other cases it may be found that the runner or piece that supports the drawer shows signs of considerable wear, and the remedy for this is to replace the worn runner with a new one. Runners are fixed in two ways, and it will be found that in most of the old chests a groove has been cut across the carcass end, as illustrated in Fig. 17, to receive the entire thickness of the edge of runner. This groove is generally about ¼ in. deep, and the runner is simply glued into it. The end of the runner has a small tenon to engage the back edge of the front bearer. The partitions or dust-boards fit into the grooved edges of the bearer and the runners, and preclude any possibility of the runners working

out of the grooves cut in the carcass ends.

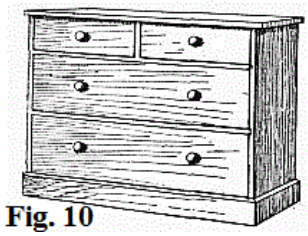


Fig. 10

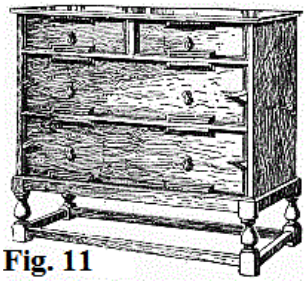
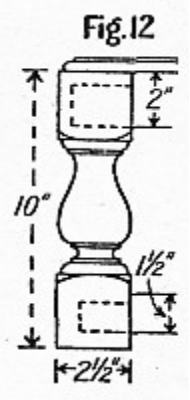


Fig. 11



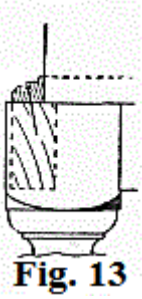
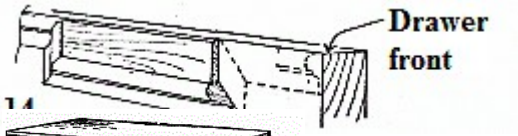


Fig. 13

Figs. 10-14. Painted chest of drawers and diagrams showing how it can be transformed into a piece of furniture in Jacobean style.



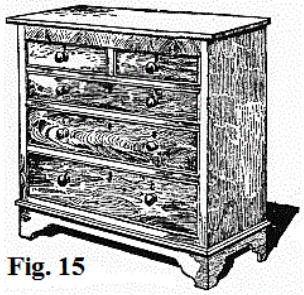


Fig. 15

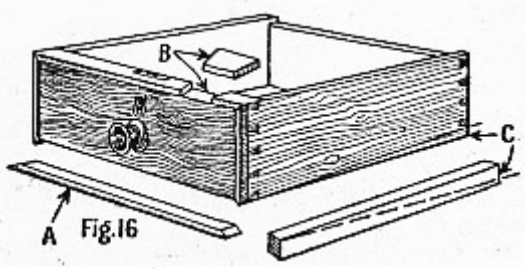
Fig. 15. Example of an old mahogany veneered chest of drawers, a common type to require repair.

Another Method of Fixing a Runner

The lower part of Fig. 17 illustrates the second method of fixing a new runner, and in this case no groove has been cut in the carcass end. The tenon on the runner is glued into the bearer groove, the opposite end notched out and prepared to receive a screw. A dab of glue is applied to the carcass end as indicated by the arrow. If the back edge of the runner be glued along its entire length, it does not allow for any contraction or expansion in the carcass end, and this will often cause a fractured or open end joint.

Fig. 18 shows such a fractured end, and, as it is practically impossible to knock the chest asunder and re-joint the end, it is necessary to glue into the crack or joint a small strip of wood with its end section wedge-shaped. If the fracture follows the general contour of the grain and a straight strip cannot be conveniently applied, the strip will have to be cut into short lengths of say, 6 in., so that they can be easily bent to the shape. Care must be taken to joint up the ends of the strips so as to leave no open joints. The job is then cleaned off level and polished.

Another common repair is a broken foot. Fig. 19 is a part sketch of a plinth which has been taken off the carcass and turned upside down. The repair is carried out by cutting away the broken portion of the old foot, until the new joint is in alinement with the top of the straight portion. This will allow the bull-nose plane to be brought into operation, so as to plane up the major portion of the joint, after which the existing mitre and corner block are scraped by using a toothing plane blade which has been temporarily removed from its stock. A new piece of wood is planed true on its lower edge, and the end is mitred. This piece is glued in position and handscrewed down, whilst two ordinary screws are inserted from the back of the corner block to secure it. When the glue has thoroughly set, the new piece is cut to the desired shape with a bow saw, as shown by the dotted line. A fine sprig or panel pin may be driven in the edge of the shaping, as suggested in sketch, after the foot has been cut to shape.



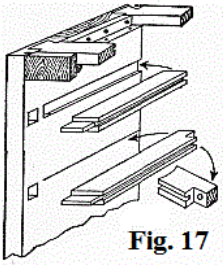


Fig. 17

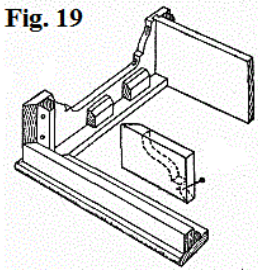


Fig. 19

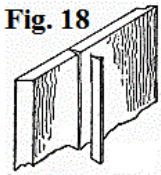


Fig. 18


Fig. 21

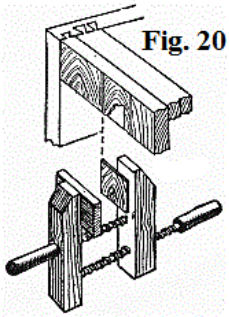


Fig. 20

Chest of Drawers.

Figs. 16-21. Diagrams illustrating how various simple repairs can be effected.

Fig. 20 shows how to effect a repair to a piece of broken veneer which has formed a cross-band on the wide top bearer of the chest. Using a steel rule as a guide to the penknife blade, a deep incision is made and the old piece of veneer removed. This may be accomplished by damping a piece of rag and placing it upon the damaged veneer. A hot iron is now applied to the rag, and the steam so generated will soften the old veneer and glue to such an extent that it may easily be peeled away.

A new piece of mahogany curl veneer is fitted to replace the damaged part and is laid by the caul method. The caul in this case may be a piece of yellow pine wood which has been planed up and rubbed over with raw linseed oil. It is heated in front of a fire, and a piece of clean white paper is placed between the caul and the glued veneer. The pressure is applied to the work by the handscrew, as shown. The work will in due course be levelled up with the steel scraper, after which it is glass-papered and polished. If old curl veneers which have been out for some years be used, it will save much time and matching up when the polishing is commenced.

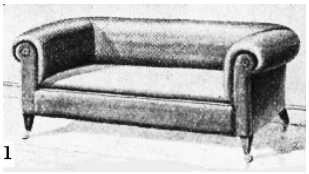
Fig. 21 represents one corner of the chest where the cross-banded mould and the veneered top have been broken away. To repair this a cut is made across the corner and the old veneer removed by the method above described. A suitably grained piece of veneer is selected and laid in position by the caul and handscrew method. A day later, a piece is glued to the cross-banded edge, and in due course it is rounded off to shape with a block plane.

The polishing and colouring up of the repaired portions of antique furniture call for great care on the part of the worker.

CHESTERFIELD SOFA. Stuffed all over, back as well as sides, to seat two or three persons, this comfortable style of sofa is sometimes supplied with added loose cushions, which should be soft and resilient, while in some makes one end is adjustable to ensure greater length for reclining.

In selecting a chesterfield it is necessary to get a good quality guaranteed by the name of the firm to be of good workmanship, since it is not possible, even for an expert, to judge of the durability of the sofa in its finished state, but any basic faults will quickly show through. The framework of beech or birch, the bracing of the frame, the spiral springs, the webbing, all lie hidden beneath the upholstery, and it is upon these unseen parts that the lasting quality of the sofa depends. The frame must be of well-seasoned timber, birch being used in the best work; the spiral springs must be of well-tempered steel, and the workmanship should be of the highest standard.

The covering can be of various materials, according to the room in which the sofa ia placed. For a lounge or living-room, velveteen, velvet cord, tapestry, a durable moquette, or a similar fabric of heavy weave, are suitable; for a drawing room, damask or velvet. This sofa is not suitably covered with any fragile material as it is usually selected for comfort and service.



Chesterfield Sofa. Fig. 1. A comfortable sofa which can be made by following the directions given in this article.

How to Make. Dimensions for the chesterfield shown in Fig. 1 may vary slightly in length for individual requirements, 5 ft. 6 in. over all when finished being about the smallest useful size; 6 ft. 6 in. the size most frequently met with; and sizes up to 8 ft. or 9 ft. for halls, institutions or ballrooms. The length for framework (Fig. 2) in the present case is put at 5 ft. 6 in.; height to top of end posts, 1 ft. 10½ in. or *2* ft., to include castors; height of front rail (seat), 8 in.; and depth of seat, front to back over all, 2 ft. 6 in. to 3 ft. for a large size. Settee frames of the chesterfield size vary in detail according to the character of the furniture they go with, but for a fixed end settee, the frame (Fig. 2), of which one half is shown, will be as simple as any to make. The woods generally used for frames are beech and birch, but pine or American whitewood could be used for parts, the show wood (in this case the legs) being in oak, walnut or mahogany, as an improvement upon staining to match existing furniture.

In making a start with the settee frame the front posts (A) will be cut from 4 in, by 2 in., the rounded or scroll portion being made up by an extension piece to project 1½- in. or so, dowelled on. This post is flush with front of settee, but in some instances is shaped or set back a few inches from the front edge of seat rail, separate stumps (either turned or tapered) being jointed into the seat framing. The front rail of seat (B) is 4 in. by 3 in., preferably tenoned into position, but sometimes dowelled. It is shown as straight, but is often shaped to break forward as at X (Fig. 2). The end (C) and back seat rails can be somewhat lighter, 3 in. or 2½ in. by 2½ in., tenoned or dowelled at front; shaped portions at corner are separately worked and dowelled into position.

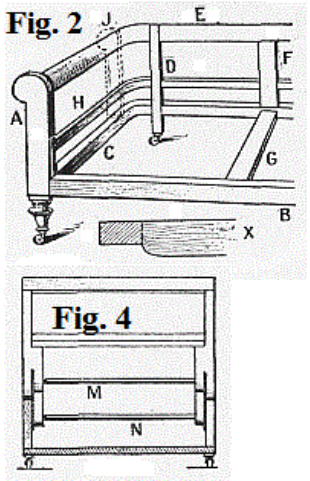
For the back legs (D) 2 in. by 2 in. material will be required, the legs being continued to the ground. If preferred they may finish into the back seat rail and have separate shaped legs dowelled or bridled into the seat framing. The top back rail (E), 4 in. by 2 in., has the centre upright at back (F) tenoned into it and into the seat rail, size for this and the centre stretcher (G) being 3 in. by 2 in., the latter being dovetailed and screwed to the seat rails from below. The stretcher is sometimes shaped with a dip or bend in the centre, or its place may be taken by one or two stout iron rods similarly shaped and screwed between the seat framing back to front. The stuffing or tacking rails (H) are made to finish 1½ in. by 1½ in.

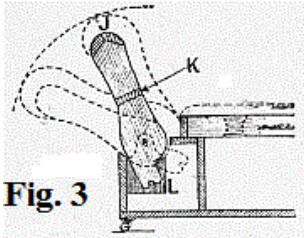
How the Adjustable End is Made

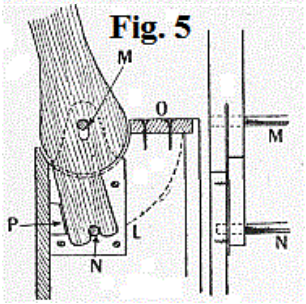
A frame made to the foregoing sizes will be fairly stout for the size (5 ft. 6 in.) mentioned with fixed end. A chesterfield settee frame, however, is nowadays usually made with one or both ends adjustable to let down to the seat-level and serve as a lounge. In this manner the framing of Fig. 2 would have a similar upright to A built into the back framework, as shown in dotted line (J), and a separate head framing on the lines of A, E, H, hinged to let down. There are several head adjusting actions on the market, some of which are obtainable through cabinet makers' sundries-men; but, as a rule, they are somewhat complicated for the

amateur to deal with. Details of one are shown which would be of assistance to the average worker in making his settee with drop end, the best way being to make a smaller model in thin wood, so that the method of action is clearly understood, before cutting up good material.

Fig. 3 gives a diagram of an adjustable head. The sectional view shows the head erect with dotted line of stuffing, together with a dotted line of head lowered to a reclining position. All that is necessary to operate the action is to lift the head slightly, which disengages it from a bottom stop-rod, and allows the head to revolve to a lower angle, where it is stopped by the extension piece bearing against a rail fixed for the purpose from side to side of the box seat. The wood from which these head scrolls are shaped should be about 2½ in. thick, preferably of hardwood, to counteract any undue strain. The seat frame should be boxed in at ends to a height of about 5 in. clear above ground, and with sufficient opening above to receive the base portion of scrolls, which revolve inside, in addition to clearance for the material with which the settee is covered to be turned in and tacked down. The bases of the scrolls will be portions of a 7 in. circle, and a radius of 3 ¾ in. struck from a point about ½ in. above the box will indicate the amount of clearance required. These head scrolls are connected by the stuffing rails indicated on Fig. 3 at J and K. The sheet-iron brackets at L are screwed to the insides of box, and serve as rests for the head to pivot upon. The upper portion of the brackets can be shaped as the dotted line indicates, and is holed above and below for the entry of ⅜ in. gas pipe, to serve as pivot M and stop rod N, Fig. 4.







Figs. 2-5. Working diagrams, including details of alternative drop end.

The brackets are boxed in to prevent any possibility of interference with the upholstery at a later stage. The horn, or extension of the scroll lying over the bracket (as in section, Fig. 3), is therefore inside the box, and is mounted by means of a rip saw cut midway of the thickness for the bracket to enter. The outside portion of the scroll follows the compass line so that it tilts clear of the box opening previously referred to.

The end view of the framing of head seen at Fig. 4 shows pivot-rod and stop-rod in position. An indication of the method of lowering and securing the head, to an enlarged scale, is given at Fig. 5. The elongated hole for the pivoting rod at M (Fig. 5) allows of the lifting of the complete head clear of the stop-rod N; and, when thus free, it will pivot back till the horn is stopped by the rail O, which must be stout and well screwed home to afford a firm bearing. The dotted line shows the limit to which the saw cut for the passing of the iron bracket extends, and the latter must have the screw holes well countersunk so that the screw heads do not hinder free action. A tapered block, P, glued to the box end will serve as a guide for the horn to slip back to its position after being lifted.

An enlargement of the end view of the rods on the lower portion of the scroll (Fig. 5) indicates the stop rod N, bedded into the box sides to about two-thirds of its thickness, and the pivot rod M, passing through scroll and secured by burring over on a washer, which may be thin and slightly sunk. The position of sheet iron brackets is made clear at L, Fig. 5. By a little manipulation it would be possible to obtain an angle of adjustment for the head midway between the extreme points indicated by the foregoing, fixing being in the course of the dotted line near L, Fig, 5. *See* Divan; Ottoman; Settee; Upholstery.

CHESTNUT (Spanish). The Spanish or sweet chestnut, with green serrated leaves, grows up to 60 ft. in height. When ripe, the nuts are brown and glossy, but sweet and not bitter like those of the horse chestnut (q.v.). This tree likes a loamy soil with sand rather than clay. Propagation is by nuts sown in autumn or spring.

CHESTNUT: The Wood. There are two varieties of wood, differing very much in character, produced respectively by the horse chestnut and the sweet or Spanish chestnut. The first is a light, soft, spongy wood, which loses nearly half its weight and a considerable amount of its bulk in seasoning. It is used for turning bobbins and other small articles, for carving, packing cases and also for rough outdoor boarding where durability need not be considered.

The sweet chestnut is a more valuable wood, and is the one in general use, being easy to work. Comparatively hard and heavy, it sometimes serves as a substitute for oak. In rough carpentry it is employed for fencing, palings, piles, beams; also for coffins, door and window sills, in cabinet making and for fretwork. Ladders, small casks and hoops are amongst the innumerable articles that are made with the wood of the Spanish chestnut.

CHESTNUT: In Cookery. Of all cuts the chestnut contains the least oil, is probably the most digestible, and many dishes are made with it. It is also employed in stuffing for poultry and in sauce. To boil chestnuts, make an incision in the skin of each nut and put them into a saucepan of salted, boiling water. Boil

them for about ½ hour, drain, and remove the shells and re-heat the nuts in a little butter.

If chestnuts are boiled for a few minutes before being roasted on a shovel over a good fire, they will be cooked through to the centre instead of being done merely on the outside, as is so often the case with roasting.

A savoury dish is prepared by mixing one cupful of boiled chestnuts, mashed and sieved, with the same quantity of mashed potatoes, 1 oz. of butter or margarine, a teaspoonful of grated onion, and a little salt and pepper. Butter an au gratin dish thickly, fill it with the mixture, and sprinkle the top with breadcrumbs, together with 2 oz. of butter divided into small lumps. This quantity is sufficient for one or two persons only.

Chestnut Sweets. In order to make chestnut charlotte, cut some sponge cake into a round about 2 in. thick, spreading the outside edges with a little royal icing, and fixing around it about 2 dozen savoy finger biscuits. While these are setting, put 1 lb. chestnuts into boiling water, boil them for 10 min., then remove the outer shells and inner husks.

Break the nuts into pieces, put them in a pint of milk, together with 2 in. of vanilla pod, and stew them gently until they are soft. Then rub the chestnuts through a wire sieve, and mix the purée with a little castor sugar to taste, a gill of cream (whipped), 1 teaspoonful lemon-lemon-juice and 3 oz. matrons glacés each cut in about eight pieces.

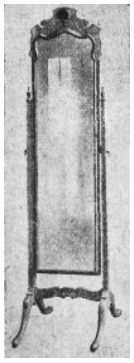
Put the mixture into the prepared case, whip, sweeten, and flavour another gill of cream, and force it over the top of the mixture, using a large rose pipe and raising the centre well. Decorate the top with pieces of glacé cherries and crystallised flower petals.

Another attractive sweet for a party is chestnut trifle. The ingredients are 6 square sponge cakes, 1 lb. chestnuts, a little white wine, some apricot jam, ½ gill cream and some custard. Boil the chestnuts, skin and mash half, and mix them with 3 tablespoonfuls of apricot jam. Leave the remainder of the nuts in hot water. Cut the sponge cakes open, spread them with the nut and jam mixture, and arrange them in a glass dish, soaking them with two tablespoonfuls of wine, or fruit syrup may be used in place of wine.

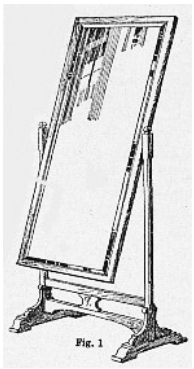
Cover the whole with a good thick custard, and when the latter is set, shell the remainder of the nuts and press them through a large-holed sieve so that they fall like threads over the custard, leaving plain a round central space.

These give character to the trifle. The central space is then filled with whipped cream. *S e e* Christmas; Marron Glacé; Royal Icing; Sauce; Stuffing.

CHEVAL GLASS. The name is applied to a mirror swung between uprights which form a stand. The mirror frame is made of 1 in. stuff, 1 ¼ in. wide including the moulding and is mortised together. The rebate for the glass is on the same level as the quirk of the moulding (Fig. 2), so that both the tenon shoulders will be level, the moulding on the mortised pieces being cut away. When ordering the glass allow the size to be 1/16 in. small all round. Fig. 2 shows how the glass is secured by glueing wedge-shaped pieces to the rebate.



Cheval Glass in walnut, Queen Anne style (*Courtesy of Harrods, Ltd.*)



Right. Cheval Glass. Fig. 1. Large swinging mirror which can be made by the amateur worker.

Glue the frame together and clean up and prepare material for the back. The panels are 3/16 in. thick and the crosspieces ⅝ in., these being grooved to take the panels. The vertical rail is in two pieces, tenoned into the other at the centre, and both are screwed to the frame.

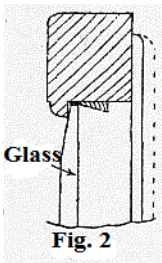


Fig. 2

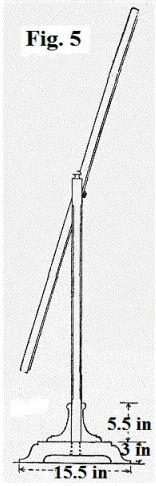


Fig. 5

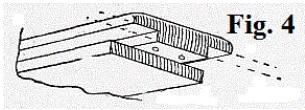


Fig. 4

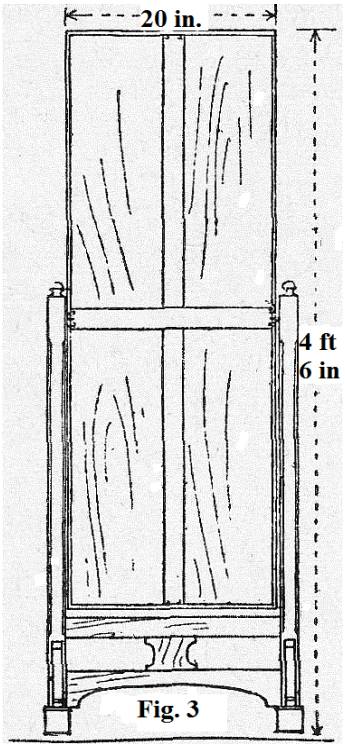


Fig. 3

Fig. 2.Showing fixing of glass.
Fig. 3. Back elevation.
Fig. 4. How rails are cut away to fit on frame.
Fig. 5. Side elevation

As it is necessary for the panels to fit right on to the frame the rails are cut away, at the ends, on the underside, just the depth of the bottom flange, as in

Fig. 4. Screw these in position and fit the panels, rounding off the edges to give a lighter appearance, and mark on the inside their relative positions, so that they may be replaced in the same places.

The uprights, for the stand are 1¼ in. square and are cham- fered at the edges as shown, the top being cut to a finial shape. They are tenoned into the feet as in Fig. 5, the tenons being wedged from the underneath to give greater strength. The feet are cut from a block of wood each measuring 16 by 3 by 1¾ in. The corner brackets are fixed after the uprights are glued, and fit into small grooves cut to take them. The rails joining the uprights together are tenoned; the length is obtained from the mirror frame, an extra allowance being made so that this will swing freely without touching. The small centre ornament is stub-tenoned into the rails and is glued just prior to glueing the uprights. The frame should be carefully polished before fixing the glass.

To fix the glass lay the frame flat on a table and put the glass in position, being careful that it is right down in every part. Glue the wedges all round about 3 in. apart (the wedges are each about 1 in. long) and allow to remain until quite dry. The mirror is hung upon special brass movements which screw to the frame and stand. By turning a thumbscrew the glass is made to remain in any position. *See* Dressing Table; Mirror.

CHEVIOT CLOTH. Scottish tweed manu- facturers used to make their coarser tweeds exclusively from Cheviot wool, and in order to make softer tweeds and flannels they began also to get wool from Saxony. Thus, their coarser cloths became known as cheviots and their finer ones as saxonies; but cheviot has since come to mean not only cloth made from wool of the Cheviot hills, but any cloth made of wool less soft than Saxony, Botany or merino.

Cheviot tweed costs less than Saxony and often wears longer. Cheviot serges have a well-marked diagonal rib, and the surface instead of being bare has a short nap of fibre. *See* Serge; Wool.

CHEWING GUM. Introduced from America, this consists of chicle gum, sweetened and flavoured. Chicle gum is a substance resembling gutta-percha, obtained from the balata tree of S. America. The proportions used are chicle gum 1 lb., powdered sugar 3 lb., these ingredients being warmed and kneaded together and flavoured with cloves and cinnamon, wintergreen or peppermint. The mass is then rolled flat and cut into pieces.

CHIANTI. This Italian wine from the vineyards of Tuscany is light, dry, and easily digestible if properly matured. It has a fine bouquet and colour. It is best drunk in its own country, as it has a reputation for not travelling well. *See* Wine.

CHICKENS: THEIR INCUBATION AND REARING

Advice on Raising Birds for Egg Production and the Table

Further information will be found under the headings Coop; Incubator; Poultry. See also Boning; Casserole; Curry; Egg; Fowl; Soup and other cookery entries.

In the incubation of eggs, whether naturally under a hen or artificially in an incubator, the first essential to success is strongly fertilised eggs. Where the number of chickens desired is not large the broody hen will suffice, but for more extensive operations an incubator is a necessity.

In the selection of a broody hen great care is necessary, as it does not always follow that because a hen clucks and takes to the nest she will prove reliable. Birds with non-sitting blood in their veins should be avoided. Pullets, too, are not always to be relied upon, and it is advisable to choose birds that are two years old or over. In sitting a hen nighttime should always be chosen. The nest should be made on the ground in a sheltered corner of a shed or outbuilding, and so placed that no other hens can have access to it. It is best made by scooping out a saucer-shaped hollow, pressing it evenly down and lining it with straw.

The number of eggs to be set will depend on the size of the hen. A small bird will cover 10; a large one 15. While sitting, the hen should be allowed off the nest once a day for food and water, regularly at the same hour every morning. Sometimes a hen will refuse to leave the nest, in which event she must be gently lifted off. After this has been done a few times she will act for herself. She may remain off for about 20 min.

The food of a sitting hen should consist of maize, clean fresh water and grit being always within her reach. Should any eggs get accidentally soiled they must be cleansed with tepid water, and the nest material, if similarly soiled, should be renewed. All being well, the chickens should make their appearance on or about the twenty-first day.

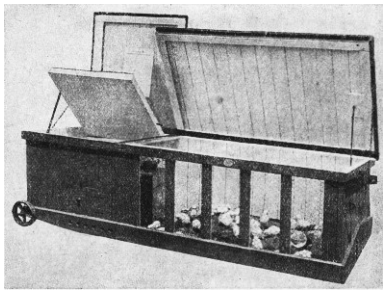
Artificial Incubation. This is a more complex proposition, everything, apart from the eggs, depending on the capabilities of the machine used and the care exercised in working it. In a small way a 50-egg machine may be quite large enough, but when it is desired to incubate a large number of chickens, one of at least 500-egg capacity will be needed. For the average poultry-keeper, however, a 100-egg machine will supply every need.

The mechanism and working of an incubator is explained in the article on Incubators. A good machine having been obtained, the first thing to be considered is where to locate it. A cellar offers many advantages; but wherever it is placed, the temperature must be even there must be no direct draughts and no fire. The machine should stand perfectly level and as firm as possible to ensure against vibration. The mode of working the incubator will vary according to the principle on which it is constructed, but every maker sends out full instructions. The temperature is the same in all cases, namely, for hens' eggs, from 103° to 104°,

reduced to 102½° the last seven days: and for goose and duck eggs, 102° throughout. The eggs require to be turned regularly once a day, and it is as well to keep the large end uppermost. As the chickens hatch they are allowed to dry, and then removed to the brooder.

Testing the Eggs. In both natural and artificial incubation, the eggs should be tested for fertility by means of an egg-tester. An infertile egg will be perfectly clear, while an egg in which the germ has started to incubate and dried will appear thick and cloudy. A rotten or addled egg will appear black, but the fertile egg will exhibit small veins radiating from a dark red centre. The testing operation should take place on or about the seventh day, when all infertile eggs should be removed, and if in an incubator, replaced.

Immediately the young chick emerges from its shell, whether it is hatched under a hen or in an incubator, it requires air and warmth to dry completely its down and to expand its lungs. Unless the hen is very nervous and resents interference, the shells should be removed from the nest as the chicks hatch, as otherwise an empty shell may cover up the chipped air-hole of a hatching chick and smother it before it has time to free itself.



Chicken. Oil-heated foster-mother or brooder, a useful appliance for rearing chickens when a sitting hen is not available. Adjoining the brooding chamber is a covered run. (Courtesy of Spratt's Patent, Ltd)

There is not the same necessity for so much care with an incubator, as the eggs are less crowded, and in some cases there is an arrangement by which the young chicks in struggling towards the light drop into the drying chamber. In other makes the chickens will need to be lifted into the drying box or drawer shortly after they free themselves from the shell, and as soon as they are properly dry, and if they seem strong enough, they can be again shifted into the warm foster-mother or brooder. Chickens hatched under a hen may be safely left with her in the nest for 12-24 hours from the time they leave the shell, but if she is clumsy or nervous it may be advisable to remove them earlier.

A coop having been prepared and previously disinfected by lime-washing or other method, the hen and her brood may be carefully removed to their new home. The hen should be lifted from the nest first, and the chicks carried in that, or an old hat, basket, or even the loose pocket of a coat. In cold weather it is an advantage to use a small rather than a large coop, as the hen will have less room to scratch about, and will brood the chickens better. It should face south and be protected from cold winds by a hedge, fence or wall, if possible.

Day-old Chicks. Many chicks are sold when 24 hours old. It is a good plan to place them on arrival in a brooder heated to as near 95° F. as possible for an hour or two. If no brooder is available, the birds may be placed in a flannel-lined basket reasonably near a fire. They should then be given a feed of warm steeped oatmeal or biscuit meal, and a little warm milk to drink. If the chicks have travelled a considerable distance, the best results will usually be obtained by rearing them under broody hens, if available. One or two chicks only should be given to a hen at first, and if she takes kindly to these the remainder may be slipped under her wings. The hen should have been sitting on "pot" eggs for some days before the arrival of the chicks.

Management of a Brooder. The brooder or foster-mother is used when it is not always possible to make use of a sitting hen. The ordinary brooder usually consists of a heated chamber which is connected with one or more outer chambers or chicken-runs. It is of the greatest importance that the brooder should be so constructed that the temperature is always kept equable throughout, and should be completely free from fumes at all times. This latter specially applies to those corners of the brooder into which the young chicks are likely to crowd. Finally, it is essential that brooders should be kept quite free from damp.

In most brooders the heating medium consists of a lamp, and in some types this lamp is placed outside the heated chamber and is rendered fireproof by the provision of a jacket made of asbestos. In another type the brooding chamber is heated by means of a hot-water tank, or by a circulating hot-water tube, which is run all round the inner walls. In a third type of brooder a hot-air tank is fitted. This tank is heated by means of a lamp. The position of the lamp should in any case be so chosen that the fumes rising from it can be carried away immediately.

The heat should be generated in such a way that the floor is properly warmed. Otherwise, if there is not a proper provision for warmth at floor-level, the chickens naturally crowd together in order to keep warm, and the strongest will climb on the backs of the weakest and either crush or suffocate them. One way of making provision for such bottom heat is by means of a lamp which is placed in the centre of the brooding chamber. The inner roof of this chamber is made of metal and forms a radiator. The heat which rises from the lamp strikes this metal roof and is reflected down to the chickens.

The newly hatched chickens should not be transferred to the brooder until the latter has been properly warmed. The brooding chamber should be prepared for their reception by heating it for one or two days. This heating will get rid of any damp which might have accumulated owing to winter storage or from any other cause. Any dampness would mean a

large mortality in the young chickens. For the first week that the chickens are in the brooder the temperature should be kept as near 90° as possible. During the second week this temperature may be gradually lowered to 85°, and during the third week to 80°, while during the fourth and the following weeks it should be kept near 70°. Too much heat is as bad as too little. Apart from the use of the thermometer, it is generally possible to tell to within a small degree whether the temperature is too hot or too cold. If the temperature is too low the chickens will invariably huddle into the corners of the brooder or round the lamp and will utter plaintive cries; if the brooder is too warm they will gasp for breath and lie huddled about in a listless fashion on the floor. Overcrowding of the brooder must always be carefully avoided. As a general rule, it will always be advisable to keep well within the number of chickens specified by the maker of the appliance as its full capacity.

Benefits of Scratching for Food

The covered run adjoining the brooding chamber is usually converted into a scratching medium by littering the floor thickly with cut chaff, among which dry chick food is scattered. This is an important part of the rearing of chickens, since scratching for the food induces exercise, generates natural warmth, and so keeps the chickens in fit condition to withstand any sudden changes of temperature, which are not always possible to guard against quickly. On sunny days, when the chickens can be confined to the outer run, the brooding chamber should be opened up and exposed to the rays of the sun. As the season advances and the chickens outgrow the necessity for a heated brooder, generally at 4, 5, or 6 weeks, they may be transferred with safety to a cold brooder.

The ordinary cold brooder comprises nothing more than a sleeping compartment and a covered outer run. The sleeping chamber should be well ventilated, but it should be so constructed that no currents of air can play directly upon the inmates, and there should be just enough room to enable the chickens to huddle together comfortably for warmth. The floor of the cold brooder should be of earth, above which a good layer of cut chaff or peat moss litter is placed, and the floor of the outer chamber should be covered in a similar fashion.

Feeding the Chicks. Several systems of feeding are practised. Owing to absorption of the egg yolk before hatching food should not be given until the chicks are 2 days old. Then they can have fine chick feed, which will encourage them to scratch and exercise. Sawdust, sand, or peat moss litter broken up fine, laid on the floor of the coop, when they are moved into it, will greatly encourage them to scratch, and will prevent them getting cramp. A wooden floor is always advisable if there is danger from rats, and will also keep them dry.

From 2 days old they should be fed every 2 or 3 hours from dawn to dark, and fresh water may be given in a shallow pan, too shallow for them to drown themselves in. If there is any danger from cats, rats or other vermin, it is advisable to attach a small wire run to the coop.

The Importance of Exercise

The hen should not be allowed to leave the coop at first, but the chicks can in this way obtain ample air and exercise without danger from vermin, or the possibility of the mother giving them too much exercise. It must be seen that the chicks have no difficulty in returning to their mother, and any difference in the height of the coop from the ground must be regulated by a brick or piece of wood.

The same care should be taken with the foster-mother or brooder, and in both cases the chicks should always be shut in at night. The coop must be cleaned regularly and all stale food and refuse matter removed. After the first 3 days an unlimited supply of fresh, clear water can be given. Special jars are obtainable which automatically regulate the supply of water, but make it difficult for the chick to foul it or drown itself. Fine limestone grit in small pannikins should also be given. If the weather is cold and damp and there is a tendency to diarrhoea, boiled rice once or twice a day will help to check it.

A grass orchard or small paddock or lawn is excellent for rearing chicks, as they will then have plenty of fresh green food, and ample shade in very hot weather. When possible, ground that has not had other poultry running on it for at least 6 months should be used. The young chickens will then be healthy and less prone to disease.

The feeding should be supplemented by coarser grain and chick feed as the chickens grow. Biscuit meal with a little meat meal may also be given. Some poultry raisers prefer to scald and give this slightly moist, whilst others —and this is the better method —dry it after scalding by mixing it with a little meal, such as Sussex ground oats. Dry feeding is much employed, i.e. a dry mash placed in pans or boxes, with a plentiful supply of fresh water always available. In a warm, dry season the chicks may be taken from the hen or foster-mother at 6 weeks old, but it is often better to leave them till 2 months old, unless the hen begins to lay again, when she may peck them.

Pullets and Cockerels. As soon as the sex of the chickens becomes apparent, e.g. from 2 to 3 months, according to the variety, they should be separated and kept in different runs. From then onwards they are termed cockerel or pullet, and though they reach maturity from 6-8 months, these terms are applied until they attain their second year. Frame, not fat, is the aim of all successful chicken-raisers, and especially is this applied to pullets, many breeders using only grain and green food for these until they approach laying, when a wet or dry mash may be used once a day. Cockerels thrive on tit-bits of all kinds, scraps of meat, etc. A mash of 1 part meat meal, 1 part pea or maize meal, 1 part supers and 1 part bran will be found very useful. Sussex ground oats, wet or dry, may be given as a change.

Wheat, oats, barley and buckwheat are the favourite grains for rearing, but it is better to give a feed of one variety, with periodical changes to others, than to give all varieties in one mixture. Maize or Indian corn is fattening and warming, and should be used when it is desired to supply these qualities. For further information consult Ministry of Agriculture Bulletin No. 54, also Advisory Leaflets Nos. 138 and 113.

How to Cook. Chicken may be cooked in many ways, roasting and boiling being the commonest. To roast, 35-45 min. should be allowed, and the oven must be hot for the first 10 min. of cooking, and maintained at a moderate heat for the remainder of the time.

Sausage-meat or veal forcemeat can be used for stuffing the chicken, and its addition makes the dish go farther. The breast of the bird should be stuffed with the forcemeat, and a greased paper placed over it.

The chicken should be trussed, and small slices of bacon laid carefully over the breast. It should be placed in a baking-tin in the oven, with some good beef dripping, and frequently basted while cooking. When half-cooked, turn the bird over and brown the back, then after 10 min. turn the breast uppermost again. While the bird is roasting, the liver and gizzard should be put to simmer in about ½ pint of well-seasoned stock for the making of the gravy.

When the chicken is cooked, skewers and string used in trussing should be removed, and the bird placed on a hot dish. The fat should be drained off the baking-tin, and the prepared stock poured into the tin and boiled up for a few minutes. It may be coloured with gravy colouring and more seasoning added. The gravy should be strained into a sauce-tureen, and bread sauce served separately, while watercress, washed and drained, may form a garnish.

Improving the Flavour

To boil a chicken, first truss it, then rub it all over with half a lemon, and tie over the breast 1 slice of fat bacon, cutting a few slits in the latter to prevent it from curling up. Wrap the bird in a piece of buttered paper; then wash and prepare 2 onions, a carrot, a turnip, and 2 sticks of celery, cutting all these into halves and putting them in a large stew-pan, together with a bunch of mixed herbs, 3 cloves, and 4 peppercorns tied in a piece of muslin. Pour in enough hot water to fill the pan about half full, and put it over a moderate fire. When the stock boils, put in the chicken and let it simmer very gently for 1 to 1½ hours. Then take the bacon from the breast, remove the greased paper, and wipe the bird with a clean cloth to rid it of grease. Serve the chicken on a hot dish with egg sauce poured over it.

Chicken may also be fried, a good method being to cut the fowl into neat joints and remove the skin, afterwards dipping them into a mixture consisting of 2 tablespoonfuls of flour, 1 teaspoonful of salt, and a dust of pepper and cayenne. Melt 2 oz. of beef dripping in a small frying-pan, put in the pieces of chicken, and fry them until they are golden brown on each side. Keep them hot while 5 or 6 neatly cut pieces of bread are fried in the same fat; then slice three tomatoes, fry them for a couple of minutes, and lay them on the slices of bread, placing a piece of chicken on top of each. Garnish the whole with small bunches of well-washed watercress and chopped parsley.

Ideas for Re-cooking. The remains of roasted or boiled chicken can be minced. To 1 lb. of finely chopped chicken allow 2 oz. margarine, 2 oz. flour, 1 pint stock, and some poached eggs. The stock can be prepared from the bones and trimmings of the chicken. Stir the flour into the margarine melted in a saucepan, add the stock, and simmer the whole for about 15 min. Seasoning should be added, and the chicken then placed in the stock. Leave the pan by the side of the fire until the bird is thoroughly heated, and serve it garnished with poached eggs, allowing one egg to each person, and one or two over. Finely chopped boiled ham can be mixed with the chicken if desired in the proportion of 4 oz. of ham to 1 lb. of chicken.

The remains of a cooked chicken may also be devilled for breakfast or supper, using a tablespoonful each of salad oil, tomato sauce, chutney, and vinegar, 2 shallots, peeled and finely chopped, and a dessertspoonful of lemon juice. Cut up the chicken into convenient-sized pieces, pour the salad oil (or oiled butter) on a plate, and dip each piece of chicken in it, sprinkling over them on both sides about a teaspoonful of pepper and salt mixed. Put the pieces on a gridiron, and grill them before a clear fire for 7 or 10 min., turning occasionally, and taking care not to burn them.

Put the shallots in a stewpan with the vinegar, and cook them over a fire for 10 min. with the lid off, then add the chutney, tomato sauce, lemon juice, about 5 grains of cayenne, and a saltspoonful of salt. Stir all together, and boil for 5 min. Serve the chicken arranged on a hot dish, with the sauce poured round.

Invalid Cookery. Specially suited for inclusion in an invalid diet is a gruel made as follows. Chop ¾ lb. chicken meat very finely. Soak a little less than ½ lb. breadcrumbs in sufficient milk to cover them, and then rub them through a sieve into a saucepan containing the chopped chicken, 1½ pints chicken stock, and a little seasoning. Boil the gruel for a couple of minutes, when it should be very thick, and serve it immediately.

Another easily digested and nourishing dish is chicken jelly. A small chicken should be boiled until tender, the meat then sliced and placed round the sides and bottom of a mould. The bones and remains of the chicken should be put back on the stove with the liquor in which the chicken was boiled, and slightly seasoned. These should be simmered slowly over gentle heat for two hours. The stock should be strained and poured into the mould. When cold, the jelly should be turned out.

A suitable dish for invalids is chicken mousse made by mincing 6 oz. raw chicken, pounding it well, and adding to it ½ oz. margarine and ½ gill of thick white

sauce. Continue the pounding process, and add 2 eggs, one by one, mixing and pounding them well with the other ingredients. Season the whole, put it through a sieve, and then stir in 1 gill of unsweetened condensed milk. Grease a large mould, three parts fill it with the mixture, and then cover it with a greased paper. Place it in a steamer and steam it for about 1 hour, then turn it out on to a hot dish, coat it with white sauce and decorate it with parsley.

CHICKENPOX. One of the commonest fevers of childhood is chickenpox, which occurs chiefly in epidemics and is extremely contagious, so that immediate isolation of the patient is always necessary. It is commonest in children up to six years of age, but also occurs among older school children, and grown-up people may contract the disease if they did not have it when young. As a rule a person can only have it once.

The first symptoms are slight fever, pains in the limbs and sometimes sickness, occurring 11 to 19 days after infection. Within 24 hours a rash appears on the body, or on the face and scalp; the small, hard red pimples form blisters filled with clear, transparent fluid. In a few days these dry into crusts and drop off, rarely leaving any scar unless the child has been allowed to scratch or pick at them. The pimples or vesicles may break out inside the mouth in some cases and cause pain in swallowing.

The chief dangers to guard against are inflammation of the kidneys and broncho-pneumonia, so that the patient, after being isolated from the rest of the family or the school, must be protected from chills and draughts, and kept in bed till the crusts have formed. Custards, puddings and other light milk diet are the rule, but otherwise no special treatment is required. If the itching about the face is troublesome, the following lotion will give relief, and should be applied with a pad of cotton-wool:

Carbolic acid	1 teaspoonful
Glycerin	1 „
Rectified spirits of wine	4 tablespoonfuls
Water	½ pint

CHICKWEED. The mouse-ear chickweed (Cerastium vulgatum) is a common and troublesome annual weed which sows itself freely in gardens. Cerastium tomentosum (snow in summer) is a vigorous, low-growing, spreading plant with grey leaves and white flowers in early summer; it is very attractive in a sunny place, but must be kept in bounds by severe cutting back when the blooms are over. Cerastium Biebersteinii is similar, but has larger flowers.

CHICORY or Succory. The chicory plant is a hardy perennial bearing toothed blue flowers in summer. It thrives in ordinary soil, and the seed is sown in ½ in. deep drills, 8 inches apart, about midsummer to provide roots for forcing.

The seedlings are thinned to 6 or 8 inches apart. In autumn the roots are lifted as they are needed for forcing. If placed in boxes of soil, the tips just below the surface, in a cellar or other slightly warm dark place they will start into fresh growth.



Chicory. Head of a forced plant.

As it contains both sugar and starch, the root of the chicory plant has a food value, and when ground it is widely used for mixing with coffee. The usual proportion is one part of chicory to four parts of coffee. It is also employed to darken the colour of soups and gravies. The green leaves are a useful addition to winter salad, or may be cooked for use as a vegetable. *See* Adulteration; Coffee; Salad.

CHIFFON: In Dress. This soft-finished, rather open-textured silk of light weight is used with lace or for fragile dresses and scarves, etc., in either plain colours or patterned varieties. Light and pliable silks of other descriptions are sometimes called by the additional name of chiffon. Thus there are chiffon velvet and chiffon taffeta.

CHIFFONIER or Cheffonier. Of French origin and descended from the cabinet, chiffoniers became popular in Great Britain in Victorian times and were chiefly made in rosewood or mahogany, fitted with knobs and handles of brass. They are still seen, usually taking the place of a small sideboard. The doors are well panelled, with brass beading along the edges, while the feet are often in the shape of claws. In the finer pieces sphinxes and other figures in gilded bronze serve for supports to the article. *See* Sideboard.

CHIGNON. Word used to denote a roll of hair in the nape of the neck. The ladies of the 18th century padded this roll of hair with a stiff cushion of false hair. It was then powdered and pinned in position with prong-like pins, and curls were attached to it. A century later women in dressing their hair threw it forward over their faces; they then pinned on the chignon pad and dressed the back hair over it, tucking the ends under the chignon. *See* Hair.

CHILBLAINS: How To Cure. Due to exposure to cold, chilblains painfully affect the fingers and toes in the form of purplish inflammation of the skin, sometimes running on to blisters and ulcers. As a rule, the sufferer's circulation is not very active, or he may be run-down. There is intense aching and tingling, with swelling and purpling of the skin. When blisters form and break, leaving ulcerating surfaces underneath, the chilblains are said to be broken.

The patient must see that gloves and boots are worn loose, socks thick and all-wool, and frequently changed. The feet should be placed in warm water at night and

dried briskly. A hot-water bottle in bed is not desirable, but if it is used it must not be placed near the feet. If the hands are cold, warm them by rubbing together or washing in almost cold water.

The circulation should be stimulated by regular outdoor exercise and a generous diet. Cod-liver oil should be taken, or cod-liver oil and malt. A teaspoonful of the syrup of the hypophosphates of iron, quinine and strychnia three times a day, after meals, is an excellent tonic for an adult. Benefit may accrue from taking calcium lactate in 15-grain doses (5 grains for a child) thrice daily for two or three days at a time. If the taste is objected to, add as many drops of the liquid extract of liquorice.

As soon as the redness and swelling appear the affected parts should be painted with tincture of iodine or camphorated alcohol rubbed in. They are then powdered with bismuth salicylate, 1 part, and starch, 1 part. If the heat and irritation persist it is well to apply zinc ointment or an ointment of ichthyol 30 per cent, in vaseline.

If blisters form and break, cover the whole part with a piece of lint, spread ⅛ in. thick with boracic ointment, and bandage tightly; or this ointment may be used: birch tar, 1 dram; zinc oxide, 2½ drams; vaseline, 5 drams. For washing the sores, especially if they are suppurating, there is nothing better than equal parts of hydrogen peroxide and warm water. *See* Boot; Foot; Hand.

THE CHILD: ITS CARE AND TRAINING

Dietary, Hygiene and Legal Status

The first year of life is dealt with under Baby. See also Adenoids; Croup; Measles and other complaints to which children are subject. Children's Party; Doll, etc., may also be read

All healthy young animals, the human included, are playful and active during waking hours, and need a large proportion of rest in consequence. During the second and third years 12 hours' sleep at night, say, from 6 p.m. to 6 a.m., with a couple of hours during the morning and another half-hour during the afternoon for the second year child, is a healthy allowance, though individual children vary a little in their requirements. As the child grows older and his interests increase, the daytime hours of sleep become shorter, but a rest after the midday meal should be encouraged up to 5 or 6 years of age. Early bedtime hours are most important throughout. Children from 10 to 13 years of age should have 11 hours' sleep, and from 13 to 16 or 18 at least nine hours.

From the earliest age they should be trained to sleep alone, in their own cots or beds. A hair mattress is the best, though during the second year, when control over the bladder is still imperfect, bran, which is easily and cheaply renewed, may be used. The bed-clothing should be as light as is compatible with warmth. Cellular blankets, being light and porous, are particularly good for children. Eiderdowns are not recommended. For very young children it is permissible in winter time to warm the cot beforehand with a hot-water bottle, which should be removed when the child is put to bed. Light woollen or Aertex sleeping suits, with long sleeves, may be used for boys and girls during the cold season.

The importance of fresh air in the bedroom cannot be over-emphasised. Fresh, cool, circulating air has a stimulating and beneficial effect on the body, and as children spend such a large part of their time asleep, effective ventilation of the bedroom should always be secured. So long as the bed is protected from direct draughts, the bedroom window should always be kept well open. An exception may be made in very foggy weather. In very cold weather the air of the room may be maintained at a suitable temperature (about 50°-55° F.) by artificial heat, such as a fire or radiator. Winter and summer, whenever conditions are possible, a day-time sleep should be arranged for in the open air.

The Child's Diet. By the age of 2 or 2½ the first dentition should be complete, and to ensure this and help the teeth to grow sound and strong the child's powers of mastication should be encouraged as much as possible. Three meals a day should be the rule throughout early childhood, the last meal being the tea-supper.

Up to the second birthday the child should have one pint of milk to drink, apart from that used in cooking. This should be reduced to three-quarters of a pint after the second birthday. Too much soft food should not be given, but chewing should be encouraged by serving crisp packeted cereals, dry buttered toast, rusks, Vitawheat, Ryvita and suchlike. Small quantities of honey or home-made jam (without pips or skins in the case of young children) can be added. Fruit is essential, and is particularly good at breakfast time. It should be fresh (sieved or pulped when the child is very young), if possible. Dried fruits are excellent, also, and of the tinned varieties apricots and pineapple are rich in vitamins and iron. If fruit is stewed, only those varieties should be chosen which do not need excessive amounts of sugar to make them palatable. Well-cooked porridge, served with milk, is wholesome, but should not be given constantly. Meat or fish dishes are not necessary for the child under two, their place being taken at midday by vegetables in season (except onions), served with coddled egg, ground nuts or cheese. Raw, grated vegetables and salads should be introduced in small quantities, and gradually increased. Milk mixture, and later milk, is given to drink at breakfast and the tea-supper.

After the second birthday the child may have for the midday meal an increasing variety of simple, well-cooked dishes, but fried or twice-cooked foods should be avoided. Twice a week the child may have under-done meat or chicken; twice a week fish, preferably light varieties such as sole or plaice, or herrings in season: three times a week vegetarian dishes made with egg, cheese, nuts, macaroni, etc. Green or root

vegetables daily are important. Potatoes are best baked in their jackets. After three years uncooked greens, salads and root vegetables should be increasingly used.

All varieties of milk pudding, junket, jellies, steamed or boiled suet pudding with syrup, also baked apple or sieved stewed fruits, may be given from 15 months, provided the child is of average development. Beyond two years more variety may be allowed, also light homemade pastry. Fresh fruit and vegetables are always essential, and may be usefully served in the form of a finely shredded salad.

From 7 or 8 years onwards, when the child begins to go to school, the tea-supper will be given later in the day and will be a more substantial meal. Meat is not advisable, but soup, fish, or a well-made egg or cheese dish may be added, with milk pudding or fruit. This should be given at least an hour before bedtime. Tea and coffee are best withheld until after 9 or 10 years of age.

Foods for Growing Children

From the age of 10 or 11 years onwards, a period of rapid growth and development, both boys and girls need a plentiful supply of wholesome food, but meat, if given, should not be given more than once a day. At no age should anything between meals be allowed except fresh fruit and water to drink. The best time for the latter is half an hour or an hour before meals. Drinking at meal times should be discouraged, and the habit of sipping between mouthfuls that some children are allowed to acquire is certainly a bad one. Highly seasoned dishes, sauces, pickles, vinegar, curries, or fried foods should not be given.

While food-faddiness should be discouraged, a small percentage of children display idiosyncrasies towards certain articles of food, such as fish, eggs, or some varieties of fruit. Skin rashes, maybe vomiting, with fever follow ingestion of these particular foods. If such be the case they should be omitted from the diet, and medical advice obtained if necessary.

The Use of Aperients. A word may here be said about the use of aperients. The child should be trained from infancy to empty the lower bowel daily, preferably after the first meal of the day. The stomach and intestines have natural, rhythmic movements of their own which need to be respected and cultivated. An unnecessary dose of purgative medicine may upset this delicate neuro-muscular mechanism for indefinite periods.

Washing and Bathing. For the first few years of life a daily warm bath, preferably at bedtime, is essential. If possible, this should be continued all through childhood, but where bathing facilities are restricted it may be given two or three times a week. From an early age, however, the child should be trained to the use of cold water. Unless contra-indicated on medical grounds, the body each morning should be sponged all over with tepid water, the temperature of the latter being gradually reduced until water from the ordinary cold tap is used. Rub briskly with a bath towel afterwards.

As a general rule quite young children soon learn to appreciate this process, which has a stimulating and invigorating effect on the whole body, and no doubt tends to increase resistance to catarrhal infections. Provided the reaction afterwards be brisk, healthy boys and girls should take a cold or cool plunge bath each morning, followed up by simple gymnastic exercises for a few minutes. When the warm bath is not taken at night, exposed parts of the body should be washed before going to bed.

Teeth must be cleaned in the morning and after the last meal at night, the latter being more important. If particles of food, especially starchy varieties such as bread and biscuits, remain around the teeth during the night, fermentative changes take place and the enamel of the teeth is injured. Examination by a dentist at regular intervals—about once every six months—is most important. The hygiene of the nose is also very important. Children should be taught as young as possible to blow the nose and use a pocket-handkerchief. If the nasal cavities become blocked the child tends to develop a habit of mouth breathing which is one of the factors in the development of adenoids and their attendant evils.

As children approach the age of puberty it is desirable that they be given simple instruction about sexual life and its results. One of the parents is the most suitable person to do this; but if he or she feels unequal to the task there are excellent little books to be had dealing with the subject, or the services of a sympathetic teacher may be enlisted. Girls should also be told beforehand the nature of the menstrual periods, which usually start from 13 to 14 years of age.

The Legal Side. A father is the guardian of his legitimate children. But if the father and mother do not live together, and there is a dispute as to which of them shall have the custody of the children, the court will take account of the children's welfare. Unless the mother has been guilty of adultery, or is a drunkard, or there is some other reason why she is not fit to have the custody of them, children of tender years are practically always handed over to the mother. She may even be appointed their legal guardian and the father entirely ousted when he is unfit to be guardian, as if he has been cruel to them, or is a confirmed drunkard and wastrel, or is living with another woman, or brings his children into contact with immoral persons.

The father has a right to say in what religious faith his children shall be brought up. After the father's death it is usually assumed that he wished the child to be brought up in his own religion, but the court will regard the welfare of the children as the paramount consideration.

Any agreement before marriage as to the religion in which the children shall be brought up is worthless, for the father can still insist on all the children being brought up in whatever religion he chooses, subject to the qualification stated above.

A child's earnings belong to the child, not to its parents. A child earning money who lives with his parents is entitled to bargain how much he will pay for his keep, and the parent has no right to demand his wages and make him an allowance for pocket-money. A child's misdeeds are his own, and he alone is responsible for them. So that a father cannot be called upon to pay, for example, for windows broken by his son. The father (mother, if no father) is responsible for a child of school age attending school, and may be fined if the child fails to attend.

A father cannot be compelled to maintain a child capable of supporting himself or herself; but if a child of any age is, by reason of infirmity, whether mental or bodily, incapable of self-support and becomes a charge on the rates, the Poor Law authorities may summon the parent and obtain a magistrate's order that the parent shall assist in defraying the cost of maintenance. A father is bound to provide a child under 16 with sufficient food, clothing, and medical attendance; and if he does not, is liable to be summoned for neglect, and fined or imprisoned. The mother of an illegitimate child stands in the place of the father of a legitimate one.

Baby Farming. Any person who, for payment, takes charge of children under 7, apart from parents, relatives, or guardian, must notify the local authorities within 48 hours of so receiving any child. If the child dies, or is transferred elsewhere or if the baby-farmer changes her (or his) address, the fact must also be notified.

These local authorities can appoint inspectors to visit the homes and regulate the number of infants which can be kept in them. Persons are not allowed to keep children if their premises are insanitary, or if they have been convicted of previous offences.

Child Labour. In Great Britain local authorities have power to make by-laws restricting the employment of children of school age, and to regulate street trading by persons under 18. Any rules made can be ascertained at the office of the town, or urban, district council.

No child under 12 can be employed at all. Children under 14 may not be employed before the end of school hours, before 6 a.m. after 8 p.m., or for more than 2 hours on any school day; or on Sundays; or at any time in carrying heavy weights. No child under 14 may, without a licence, take part in any entertainment in connexion with which a charge is made, and no child under 16 may take part in any public performance involving danger to life or limb. Under the Shops Act, 1934, no person under 18 can be employed in or about a shop for more than 48 hours in a week except during periods of exceptional or seasonal pressure.

It is a legal offence for children under the age of 14 to be found on licensed premises, and for anyone to sell cigarettes to any person under the age of 16, whether for his own use or not. The police have powers to seize cigarettes or cigarette papers in the possession of any person, apparently under 16, whom they find smoking in a street or other public place. Any person who gives any intoxicating liquor to any child under five except in case of sickness is liable to a fine of £3. No child under 7 must be allowed to be in a room with an open fire which has not a proper fireguard unless reasonable precautions are taken.

Juvenile Courts. These are held for the hearing of offences by children. Parents may be ordered to pay the fine imposed on the children. Children are prohibited from seeing certain cinematograph films unless accompanied by an adult, and in the case of other films are excluded altogether. The chief legislation on children and their protection is found in the Children Act of 1908, the Education Act of 1921, and the Children and Young Persons Act, 1933. *See* also Cruelty.

CHILDBIRTH. The expectant mother, besides making a sufficiently early arrangement with a doctor and nurse, must make other necessary preparations, for although childbirth is a perfectly natural and physiological process, it exposes the patient to the risk of infection by microbes. The room in which she is confined should, therefore, be thoroughly clean.

When there is a choice of rooms, let the one chosen be as large and airy as possible, and provided with a fireplace. The bedstead should be plain and easily cleaned, and should be placed so as to permit of easy access from either side, screens being used to prevent draught. It should have a good spring mattress and over this a clean hair one. A mackintosh or waterproof-sheet is placed over the latter, or, where this is not available, several layers of clean brown paper. Over this is placed a blanket and then a sheet. The bed is to be protected by putting a sheet of mackintosh below the hips and covering it with a draw-sheet, which consists of a piece of sheeting folded to the breadth of about a yard.

Labour takes place in three stages. In the case of a first baby the whole process occupies on an average 16 hours, but it may be shorter, as it usually is in subsequent confinements, or much longer. The doctor should always be summoned at the first symptom of labour.

It may be useful here to mention some of the more necessary things which should be procured in anticipation of a confinement: one or preferably two mackintosh or waterproof sheets, drawsheets, at least three abdominal binders for the mother, two or three dozen sanitary napkins of the largest size, 1 or 2 lb. of absorbent cotton-wool, some stout linen thread cut into lengths of about 10 in. or strong narrow tape, clean lint or linen, a bottle of lysol, large and small safety pins, a clean nail-brush, antiseptic dusting powder, a pot of vaseline, clean scissors, and two basins. Three or four lengths of thread are tied together at each end to form a ligature, and two such are required. They should be boiled for half an hour before use, or in an emergency

(*Continued in page 431*)

CHILD: FROM TWO TO TWELVE YEARS
Healthy Habits that teach the Art of Living



Right: a new idea in bibs. It protects sleeves as well as the front of the clothing (Photo. Strong)



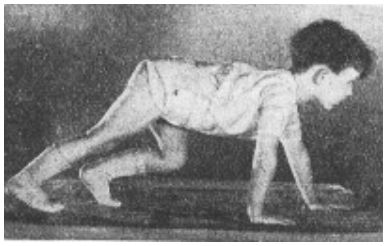
Left: the "Kangaroo Hop," for keeping the ankle, thigh and stomach muscles in trim.



Right: walking on tip-toe with tiny steps, a test of poise and muscular control which strengthens the metatarsal arches of the feet.



Left: another balancing exercise, heel on the floor, to keep the legs both supple and well-controlled.



Right: " Bear Walk "—keeping the back straight so that knees never touch the floor. (Photos, P.A.L)



Three more simple exercises. Right: bend down, touch one knee with head, and hold ankle.



Left: sit with knees straight, hold toes and tuck head down in between the arms.



Left, long-sitting: good for spine and shoulders. (Photos, P.A.L.)



Various good habits which, formed in early childhood, make for health and discipline. Left: deep dish and special baby spoon. Self-feeding should be encouraged at as early an age as possible.





Left: a bad way of sitting at table, apt to lead to round shoulders and hollow chest. Right: the proper attitude.



Above: By the age of four, or earlier, a child should be able to dress himself. (Photos, Magazine Service, Studio Lisa)

dipped in lysol solution. Lint and other dressings may be baked in a hot oven for half an hour, care being taken not to scorch them. Abdominal binders, towels, sheets, etc., should be freshly laundered and put away. *See* Baby.

CHILDREN'S PARTY. To be successful, a children's party requires an organized programme. It is easier to entertain children under 11 by themselves, as they like to play games and to have the undivided attention of sympathetic grown-ups, while older children often get bored with romping. It is usually a mistake to invite any child under five except to a real nursery party.

On the invitations, sent out about 10 days beforehand, the hour of leaving should be stated, to avoid any confusion in the fetching arrangements. Some hostesses engage a conjuror, a ventriloquist, or have a private cinema show, as a second part of their entertainment, finishing about 9.30, the older children staying on after that to conclude the party with dancing.

For a younger children's party beginning at 3.30, a room in which to play games should be cleared of everything except a gramophone or a piano and chairs. The more brightly this room is decorated the more quickly everyone gets the right spirit for a party. On arrival, most children are apt to be serious, and something must be done first to help them to get over their shyness. A jolly game such as musical chairs, or one of its variants, is a good start, while presents—trifles from a 6d. store— provided to send everyone away happy at the finish also make for success. The old-fashioned bran tub is voted rather messy for indoors, and the lucky dip has taken its place. This is simply a large laundry basket or box prettily disguised and filled with toys. A cloth is spread over the top, and each child puts a hand under this and drags out a parcel. Or the presents may be hidden about the room in which tea has been served, and the party end with a treasure hunt.

Making the Tea Table Attractive

Refreshments are most important at all children's parties. The table should be gay with a variety of cakes, fruits, and sweets. For small children there should not be too many rich things, but different layer and iced sponge cakes and varieties of fancy breads and buttered rolls. Fruit salad in pretty individual glasses always pleases. At a winter party crackers are an attraction. A large selection of coloured balloons are also useful, and can be given, one to each child, after serving as decorations, at the end of the party.

After tea all the old-fashioned games will go merrily. The great thing is to change a game directly it shows signs of flagging. When half a dozen children have been caught in blind man's buff it is well to start its variant. One person is blindfolded and given a stick to hold. The others take hands and dance round him in a circle until he bangs on the floor as a signal to stop. He then points the stick at somebody and says, Make the noise of a cat, dog, or any other animal that occurs to him. The person addressed has to take hold of the stick and obey the order, while the blind man tries to identify the voice. If he succeeds in guessing rightly he changes places with that person. After this game may come musical bumps, hunt the slipper, or any other game that may be suggested. Most children will like some dancing to a gramophone. Competitions also, with prizes, always seem successful. A favourite is to give each child a balloon that has not been blown up, together with a short piece of tape; stand the children in a ring and at the starting signal they begin to blow up the balloons, a prize going to the biggest, after everyone has either tied up their attempt, or burst it in the effort to win the prize.

Illustrations of fairy stories and nursery rhymes can be cut out of cheap paper editions, the names removed, the pictures pasted on cardboard, and the child who guesses the most correctly is the winner. Where a hostess is specialising in a young children's party, a marionette or a Punch and Judy show, which can be hired through the entertainment department of a big store, will be sure to prove a great success as a finishing touch to a party of this kind.

For older children, at a later hour, there would be either a sit down or buffet supper. If the latter, it is well to have small tables, with chairs, scattered about the dining room to put glasses, etc., on. Most children delight in a stand-up supper; it has all the joy of the picnic, and boys feel pleasantly unrestricted as to what they may consume. After supper, should there be no entertainer, dancing is the rule; sometimes the party is a bigger success when the guests are in fancy dress. In some houses the children have a passion for charades, and love to get them up secretly with some of their friends before the day of the party. Any costumes that are to be worn should be put out ready in bedrooms beforehand, and a stage-manager chosen to superintend.

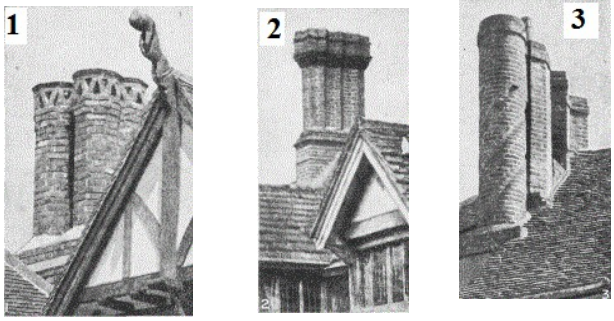
A summer party is pleasantly and quite easily arranged where there is a large garden, and all sorts of outdoor games can be played. Sports can be organized, with three-legged, wheelbarrow, obstacle, egg-and-spoon, and sack races. Tea is served either in the house or in a marquee, and in the evening there can be a dance with supper and an orchestra in a marquee lit by Chineselanterns.*See* Charades;Christmas;Fancy Dress.

CHILL. Exposure of the body to a draught of cold air or to dampness may bring on a chill. The patient feels shivery, may be nauseated or sick; there may be severe headache, a degree or more of fever, and he feels he is in for some illness. In a few hours all symptoms may pass off; on the other hand, congestion of some internal organ may follow, when the chill is said to have settled in the lungs or liver, etc. The commonest results of a chill are a cold in the head and bronchitis (q. v.). A hot mustard foot-bath, warm drinks, and hot-water bottles in the bed, the patient being put between blankets, are the immediate remedies for a chill. *See* Cold.

CHILLI. The dried pod of the capsicum plant is used in making curries, chutneys, and in pickling. In the green state it is eaten as a pickle. Chilli vinegar is used as a relish with fish. To make it 75 fresh chillies are used to 1½ pints of vinegar, the vinegar being boiled and, when cold, poured over the chillies. The whole must be tightly corked and left for two or three weeks, when it will be ready for use.

CHIMNEY. In building a new house it is well to remember how much the chimneys will influence its appearance, both at close view and at a distance when they become perhaps the most important detail of outline against the sky.

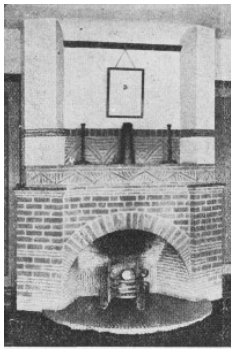
British architects are again taking an interest in chimneys and are not only designing them so scientifically in small houses that ugly pots and cowls are unnecessary to make the chimneys draw properly, but also with such an eye to decorative value that they may be now, as in Tudor times, ornaments which enhance the whole building. Elizabethan architects made such a feature of chimneys that they frequently designed them as part of the outer walls; the bases of such chimneys, when reproduced in modern houses, make provision in the interiors for inglenooks.



Chimney. 1. Ornamental brickwork, typical of the Tudor period, used with good effect on the chimneys of a modern house. 2. Three chimneys brought into one stack. 3. Spiral stringing on a round chimney.

Colour of brick used for the stacks is considered carefully. Dark red bricks may be selected for chimneys on a stone-tiled roof, a lighter shade of red on dark red tiles, and mellow tints for the plain brick chimneys suitable for thatched roofs.

Ornamental brickwork was also used with discretion in Tudor times. It is shown as adapted to a modern small house on the beautiful chimneys in Fig. 1. A good outline on a gabled roof is also achieved by bringing three chimneys into one stack, as in Fig. 2, while a round chimney is a charming architectural feature in Fig. 3, where the brickwork is enriched with spiral stringing composed of projecting bricks.



Chimney Piece. Modern brick chimney piece, particularly effective design for a hall.

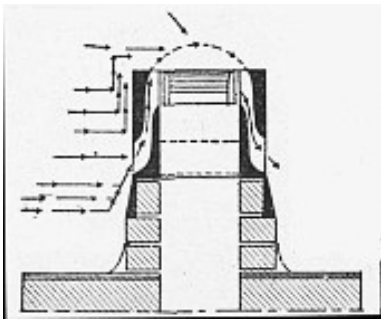
Smoky Chimneys. An insufficient supply of air to the fire is the cause of many a smoky chimney; it is discovered by opening a door or window, which is effective in curing the smoke nuisance by introducing a current of cold air. Remedies in such cases are to fit the ventilating bricks near the ceiling and through an outside wall to the open air. Another method is to fit a ventilating flue under the floor and terminating in a grating, provided with a regulating shutter, in the hearth or near to the fireplace.

The real trouble probably lies in the chimney itself or in the stove. The chimney may be choked with soot and broken pieces of mortar that have got loose and fallen down, and the services of the chimney-sweep are required. When the stove allows cold air to work into the flue or chimney it causes a down-draught. Being heavier than air, the smoke can only be carried out through the chimney if the draught caused by the heated air rising in the chimney is strong enough to carry it away. Therefore any excess of cold air must be stopped.

Eliminating Down Draught. This includes attention to the pointing of the joints in the brickwork, as the chimney must be airtight. Treatment may include the partial bricking-up of the flue, reducing the actual opening to not more than 9 in. square. If the new brickwork is so arranged that the flue makes an easy turn it will almost always effect a cure.

The most frequent cause of smoky chimneys is the shortness of the chimney stack. Surrounding roofs set up eddy currents in the air which nearly always have a tendency to blow down a chimney. A second advantage of a taller chimney is the extra draught it causes. All manner of shapes of pots have been devised; of them the louvre and bent top and certain other special type pots, as well as some of the revolving cowls, have substantial claims to success. When a considerable height is added to a chimney and a galvanised iron tallboy is used, light iron stay rods should be provided.

When every expedient in the way of extending the height of the chimney has proved a failure, attention must be given to the stove and its surround. The ordinary cast-iron register stove may not be fitting perfectly airtight to the brickwork at the back, and any leaks must be made good with cement or fire clay.



Chimney. Double-coned cowl to check down draught. The air channel narrows at its centre. (Konkerwind Ltd.)

Kitchen ranges are prone to this trouble as after lengthy use the mortar may have failed; when the brickwork is no longer a tight fit up to and around the stove back, it may be remedied in the same way.

How to Deal with a Large Flue

Large open ranges can only be treated effectively by making a blower of metal or glass to restrict the opening. Dog grates and the old-fashioned open fires with a huge chimney shaft are very difficult indeed to correct. Perhaps the neatest method is to enclose the chimney opening with an iron plate having a small hole through it to accommodate an ornamental hood or bonnet. A separate soot door must be fitted to allow the chimney to be cleaned.

It is a legal offence to allow a chimney to catch fire. Various treatments are prescribed for dealing with a chimney on fire The simplest and most effective is to close al doors and windows and to stop up the top of the chimney by means of wet sacks, bricks or anything handy that can be pressed into service. If the bottom of the chimney can be closed, this also has a retarding effect on the fire. It is customary to throw salt in large quantities on the fire in the grate or down the chimney from the top, while a patent extinguisher may be used when it can be brought to bear directly upon the fire in the chimney.

The best way to prevent a fire in the chimney is to keep the fire itself in moderation, to have the chimney swept at frequent intervals, and to avoid the burning, of large quantities of paper that may be carried up the flue and set fire to the soot.

Chimney Sweeping. When a visit from the sweep is thought necessary, certain preliminaries are desirable. Begin by removing and putting away all white covers in the room. Take everything off the mantelpiece, as the sweep will need it clear to fix his black curtain. Sweep the hearth and grate perfectly free of all ashes and cinders, and spread a thick layer of newspapers all around the fireplace. The housewife knows from experience that some sweeps are tidy workers, and if such a man is coming no other preparations are necessary. But in the case of an untried man, it is advisable to take down white curtains and to cover all furniture with dust sheets.

While sweeping is in progress go outside and see that the brushes go right up the chimney and are visible above it. Some sweeps are careless about brushing right up, and neglect of this means that soot will fall later. When the sweep has gone take a hearthbrush and sweep out from the lower part of the chimney, just above the grate, the loose soot which falls from above and collects there. Then put the room in order again. *See* Fire.

Chimney Bellflower. *See* Campanula.

CHIMNEY PIECE. Since the chimney piece embraces the whole protective structure round a fireplace, from floor to ceiling, its decorative treatment is a matter of importance. One has to remember, in this connexion, that the grate is always an integral part of the chimney piece, and that one cannot design or alter the latter without considering the former.



Chimney Piece. Old oak chimney piece beautifully carved and built up to match a Jacobean panelled room. (Courtesy of Gill & Reigate.)

There are ways of converting a Victorian chimney piece into a modern one without great expense. The marble shelf can be painted after the surface has been well rubbed down and finished off with a final coat of egg-shell enamel. But this leaves the elaborate supports still visible, and on the whole the more effective transformation can be brought about by encasing the entire structure in wood. Next the grate has to be dealt with. The straight up and down lines of the wood encasement call for a more or less rectangular instead of a horseshoe shape, and this can be got by placing a piece of sheet iron, cut in the centre to the required form, across the opening, finished off by a plain moulding. Copper can be used instead of sheet iron with fine effect when dark oak is selected for the casing, or another idea is stainless steel, with a surround of black marble in place of a fender. The re-moval of the bars of the fireplace and the substitution of a barless grate will complete the work.

Where it is a matter of creating, not merely adapting, a chimney piece, there are certain general principles which should govern the choice of a design. In the first place, the size and character of the room should dictate the nature of this feature. In a small room the mantelshelf can be entirely dispensed with or restricted to 3 or 4 in. in width—sufficient, perhaps, to carry a pair of good candlesticks and one good piece of pottery or china. It should always be remembered that there is nothing more disturbing to the ensemble of a chimney piece than a mantel crowded with ornaments. When bricks are used the colour and design of the brickwork is of sufficient interest to hold the eye without disturbing detail above. The illustration of a modern brick fireplace suitable for a hall shows perfection of treatment. A mirror in an antique gilt frame or a good oil painting, either landscape or a flower-piece, inset as a panel can be usefully introduced in cases where space and surroundings permit.

If the house owner should be fortunate enough to possess a hall or a living-room with an inglenook, there is unusual scope for artistic treatment. Nothing looks better than a surround of good bricks at the sides and on the chimney breast. These should harmonise with the hearth, of which— since an open dog grate generally takes the place of the shut-in fireplace—a good deal will be seen. Tiles require careful selection. They look well in Chinese or blue delft designs in small fireplaces, and with amusing figures on them are a bright touch for the nursery chimney piece designed without a mantelshelf, the tiles being carried up to the

frieze. Lustre tiles in harmonious colourings, with hearth and kerb to tone, are also suitable for a flat treatment.



Chimney Piece. Typical Adam style chimney piece, harmonising with the frieze, from Lansdowne House, London. (*Courtesy of Country Life)*

The more architectural the chimney piece, the less need for overloading it with extraneous ornaments. For a panelled room the beautiful treatment of the Jacobean chimney piece illustrated gives some idea of richness combined with simplicity. The Tudor arch of the fireplace can also be adapted, in a room where panelling is not introduced, to a simple overmantel treatment of a plaster relief in a fine design.

Chimney pieces in the 18th century were the central interest of the rooms. Some were made in wood, but larger ones are in marble. Adam style fireplaces are adapted for rooms with classical decorative schemes, as in the one above. The Adam brothers employed Italian craftsmen to work on marble mantelpieces delicately carved in low relief or inlaid with coloured marbles. *See* Bow Ware.

CHINA AND CHINA COLLECTING

The Quest and Care of Old and Modern Pieces

Other entries to be consulted include Crockery; Faience; Pottery and those on the various kinds of china, e.g., Chelsea; Crown Derby; Sèvres, etc.

Modern china is so good decoratively that, whether required for ornament or use, many people prefer it to old pieces for their homes, as they can select it to bring out an exact note of colour desired in a room. There is also not the same worry over breakages. On the other hand, china collecting is an interesting hobby when the amateur does not think that any bit of old china, however indifferent, is better worth buying and hoarding than a beautiful piece of modern work.

Old English china, if porcelain be meant, covers a period of about a century prior to the Great Exhibition of 1851. But many collectors roam farther afield, and regard all the products of the kiln, in every age and place, as fit objects for study. More thrifty and practical lovers of old china, content to explore patiently the byways which still exist, may in time accumulate quite desirable and instructive possessions. Some may specialise in memorial ware recalling historic personages and events. Others may concentrate on blue-and-white, tracing the course of decoration and colouring from Nankin porcelain to modern Copenhagen. Others, again, may turn to special fabrics, such as Wedgwood jasper or Staffordshire salt-glaze, two very distinctive forms of old English ceramic art.

Clay Fabrics. It is essential to learn to recognize the main features by which clay fabrics are classed. This knowledge does not come in a day, and for its acquisition a disciplined eye, a sensitive finger-tip, and a magnifying lens are indispensable aids. Unglazed pottery—fashioned of infusible, dark-coloured clays, fired once at a low temperature—has endured throughout the whole history of the art. The body may be fortified by white or coloured slip, or by fluid glazes covering the whole surface. Faience comprises earthenware which is not white, usually with decorative glazes, some of its supreme forms being the Persian polychrome faience brick bas-reliefs approxi-mately of the period of Darius, and the majolicas of medieval Italy and Saracenic Spain. Delft is a variety of tin-enamelled faience, painted on the enamel in emulation of the achievements of Chinese ceramic artists. It is distinguishable from true china by the dark hue of the body, often perceptible beneath the roughnesses of the base.

It was the use by medieval Chinese potters of fusible felspathic rock, similar to china-stone, in conjunction with infusible china clay, that led to the invention of true porcelain. This is coated or glazed with a mixture of the felspar and lime, the whole being fired at a high temperature. It is vitreous and resonant, breaks with a shell-like fracture and cannot be scratched by steel. The secret of this hard porcelain was discovered in Europe 200 years ago at Dresden; in England its production was practically confined to Plymouth and Bristol.

The old Sèvres ware, on the other hand, was a soft-paste porcelain, employing artificial fusible frits, having a granular fracture, and a surface that crumbles under the file. This was the parent of Bow and Chelsea. A great advance was made in England by introducing bone-ash. When this was used with a mixture of china-stone and china clay, without the old soft-paste frits, there resulted the bone porcelain, of which, since about 1800, the best English china wares have been made.

An intermediate form, called stoneware, is partially vitrified by hard firing, and when thin may be semi-translucent. Its main defect is a tendency to crack with sudden changes of temperature. It was produced in the 17th century by John Dwight at Fulham. Out of it developed Staffordshire salt-glaze, and afterwards Wedgwood black basalts and jasper ware. With these fabrics may be classed ironstone china, semi-porcelain, opaque china, and other efforts to secure a durable material without incurring the risk and cost of intense firing.

In the 19th century the Great Exhibition of 1851 served as a turning point. Parian or unglazed statuary porcelain had just been invented, Mintons had reproduced Delia Robbia and Palissy ware, and Irish

iridescent porcelain was being made at Belleek. To the previous half-century belong many of the old heirlooms treasured in present-day homes, including examples bearing the famous names of Spode and Copeland, Davenport and Adams, Coalport, Swansea, and the Mintons, not to speak of the new wares introduced by factories established long before, such as Longton Hall, where Staffordshire porcelain originated.

Old Chelsea and Bow. To the 18th century belong many landmarks in the progress of the art. But among all the productions of that age lovers of old china are the fondest of Chelsea ware, because of its charm and historic appeal. Owing to its remoteness from our own day it is not abundant, and the homes of Chelsea and Bow china are no more.

Some 18th century factories, notably Worcester, Derby, Wedgwood, and Sèvres, are still active. No European ware earlier than the French soft-paste of the end of the 17th century ranks as porcelain. Such fabrics as Greek vases, Rhodian bowls, Samian ware, Persian glass-glazed dishes, ancient Egyptian faience, amd neolithic pottery, are a collector's or student's separate studies.

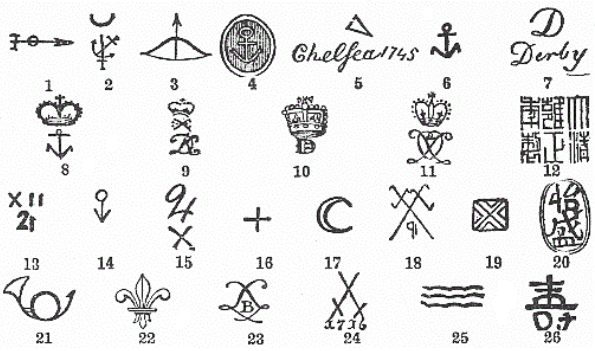
Large quantities of inexpensive porcelain are turned out in present-day China and Japan for the export market, some of which are effective. Examples of the great periods of oriental porcelain, from the Sung and Ming dynasties to Kang-hsi and the 18th century emperors, together with Arita porcelain— commonly called Imari ware—and other fabrics of Japan, tend to become rare and costly.

China Marks. The various devices used by potters for identifying work, whether it be porcelain, stoneware, or earthenware, are usually painted, stamped, or incised upon the base before the final firing. They may denote the place of manufacture, such as Swansea, the master potter, such as Spode, the workman or decorator, such as G. T. for George Tinworth, or the date, as in some periods of Sèvres.

On Chinese porcelain the date-marks usually consist of two characters, meaning period made, together with two for the emperor's name, making a four-character mark. Sometimes two others, denoting the dynasty, are added, thus forming a six- character mark. Japanese wares differ from Chinese in usually having potters' marks, which are sometimes dated, and associated with armorial bearings.

Much old work was unmarked, while, on the other hand, the presence of a standard mark on certain pieces may be actually proof of their being fakes. There are marks of indication, apart from trade devices, which connoisseurs regard as surer tests. Such are the grain of the surface, the tint and imperfections of the glaze, the roughnesses on the base, the glassy moons seen in Chelsea ware before 1757, or the substance itself, as revealed by fractures.

Often undecorated pieces, after being produced in a famous factory, have been sent elsewhere, either by their makers or by dealers, to be decorated and finished, and in such cases the marks, original or copied, have led to much uncertainty. Thus Chelsea imported genuine bodies from China for completion, and Sèvres biscuit pieces were at one time sent to Coalport for the same purpose.



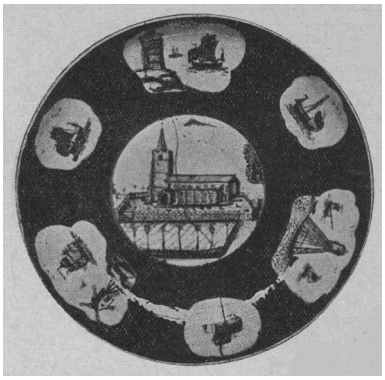
China Marks. 1, 2, 3. Bow, 1730-75. 4, 5, 6. Chelsea, 1745-69. 7. Derby, 1751-69. 8. Chelsea-Derby, 1769-80. 9. Crown Derby, 1780-1815. 10. Bloor, 1815-39. 11. Derby, modern. 12. Chinese 6-character mark, 1723-36. 13 and 14. Plymouth, 1768-72. 15 and 16. Bristol, 1770-77. 17, 18 19. Worcester, 1751-83. 20. Chinese dedicatory mark, meaning harmonious prosperity. 21. Chantilly, 1725. 22. St. Cloud, 1695-1773. 23. Sèvres, 1754. 24. Dresden-Meissen, 1716. 25. Copenhagen, 1772-74. 26. Japanese fabric mark, Imari ware, 1800.

How to Wash. In washing china, plenty of hot water, space, and clean, dry towels are essential. For ordinary household china a good soap powder should be used in a large bowl of hot water. If the china is greasy, a handful of soda should be thrown into the water. The water should be changed as soon as it becomes cool and cloudy or greasy. After washing rinse the china in clean water. The washing-up bowl must not be crowded with articles, as this leads to chippings and cracks. A dish-mop on a stick is the most suitable, appliance for washing plates and dishes. A dishcloth that is used in the hand is better for cups and small articles. A rubber scraper is useful for greasy dishes.

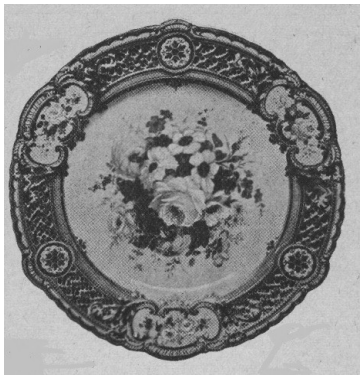
In the washing of china to which value is attached, a folded towel or thick, clean duster should be placed at the bottom of the bowl to protect the articles from the risk of getting chipped or cracked. Neither soda nor soap powder containing soda should be used when there is gilt or much red colouring on the china, as the action of the soda is sometimes injurious to such ornamentation. A few drops of ammonia or a dessert-spoonful of borax should be used instead. If the china is badly stained a little powdered fuller's earth should be applied on a cloth. For safety the fewest possible articles should be placed at one time in the bowl. A small hog's hair paint brush may be used to clean raised ornament or porcelain figures. Such articles should not be allowed to become really dirty, and should be rinsed after being washed, and then drained and dried. Tea stains can be removed from china cups

(*Continued in page 437) (Examples of various pieces of China are given in page 436)*

CHINA
Examples of English, European and, Oriental Pieces



1. Lowestoft porcelain saucer dish.



2. Crown Derby dessert plate.



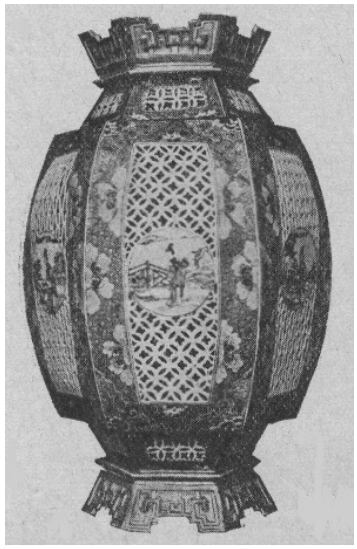
3. Dresden porcelain group, c. 1750.



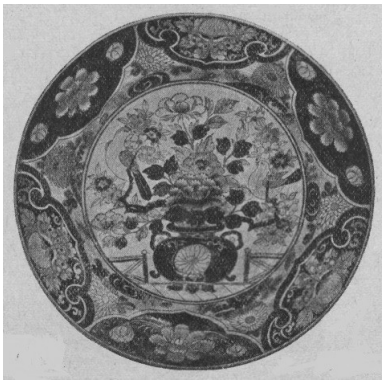
4. Chelsea porcelain group, c. 1765 .



5. Sèvres porcelain vase, c. 1770 .



6. Chinese vase with 'famille rose' panels



7. Plate in Japanese Imari porcelain, c. 1770



8. Chinese 'famille verte' vase, 17th cent.

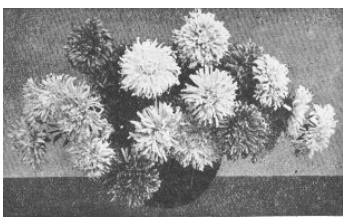
(1 and 7 British Museum; 3-6 and 8, Victoria & Albert Museum; 2. courtesy of Royal Crown Derby Porcelain Co., Ltd.)

by being rubbed with crushed salt on the dishcloth. Flower bowls and toilet jugs that have become discoloured by hard water can be cleansed by rubbing fine emery-paper over the stains, and afterwards washing them with strong soda-and-water. In putting away china in the cupboard, saucers and plates should be stacked in separate piles that are not too high. Cups and jugs, when not hung on hooks, should have the handles facing outwards in order to avoid accidents.

Packing of China. When packing china no piece should be in direct contact with any other, or with the walls of the packing case, and the packing material should be resilient and shock-absorbent. There must not be any gaps in the packing material, which should fi11 all spaces between the china. These requirements are met by the use of sawdust, old crumpled news-papers, straw or felt. Complete the work by filling in all gaps with more paper and straw, and have a layer on top at least 2 in. thick. Finally nail or screw on the lid. Give the box a good shake to ascertain if the con-tents are safe. If a rattling or clinking sound is heard, it will show that some of the china has been displaced, and this will necessitate repacking.

When packing china or any other articles for removal, it is well to remember that the removal contractor will not accept responsibility for anything that is not packed by his own men.

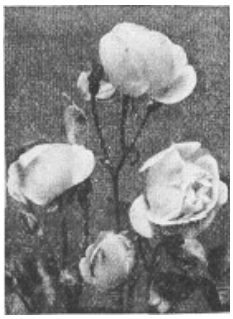
CHINA ASTER. One of the easiest flowers for amateurs to grow, the China aster is a universal favourite in all gardens. Seedlings may be raised outside in April, but stronger plants are obtained by sowing in a frame or greenhouse in February or March, always provided damping-off is avoided. The seedlings are transplanted at 4 in. apart, in boxes, and are planted out of doors in May. Great care must be taken not to over-water the small plants. There are many types and varieties of the annual aster with single or double flowers. The prim double blooms of the Victoria aster are still popular for exhibition and bedding, but for decorative effect and for cutting the Ostrich Plume, anemone-flowered and Comet varieties are superior. The single China aster is also charming. In each type there are varieties of rose, purple, mauve, so-called scarlet and other shades. If sown in May in the open, potted in mid-Sept., three in an 8-in. pot, and placed in a cool greenhouse, Victoria and other dwarf types will bloom throughout the autumn.



China Aster. Bowl of double blossoms of various colours, purple to pink and white. (Courtesy of Sutton & Sons, Ltd.)

Asters attacked by the black-leg disease, which turns the base of the stem black, should be uprooted and burnt. If this trouble has been experienced grow the plants on a fresh site, lime the soil and spray them with liver of sulphur, 1 oz. in 2 gallons of water.

CHINA ROSE. The popular name China rose is given to Rosa Indica semperflorens, or the monthly rose, so called because of the continuity of bloom. In mild districts, if planted against a sunny wall, the old pink monthly rose will bloom more or less all the year. China roses do well in beds in a sunny place. they should be pruned lightly. The best varieties are Armosa, pink; Comtesse du Cayla, reddish yellow; Laurette Messimy, rose and yellow; White Pet, white. The variety Fe11enberg, which is rose-red, is more vigorous and makes a good hedge. *See* Rose.



China Rose. Blossoms of the pink monthly or China rose.

CHINA TEA. There are about a dozen varieties of China tea, divided into two classes —green and black. It is paler in colour and less highly flavoured than Indian and Ceylon teas, and not infrequently it has a perfumed taste and aroma. It may generally be described as being a delicate, fragrant variety of tea. It is sometimes medically advised for people with weaker digestions. *See* Tea.

CHINCHILLA: The Fur. The fur of the chinchilla, which is soft and thick, from ¾ to 1 in. long, is a delicate light grey in colour, darkly mottled on the back, and shading into dusky white below. As the chin-chi11a is becoming extinct and the skins are very small, they are very valuable. Because of its fragile nature, combined with its bad wearing qualities, chinchilla ranks amongst the most expensive of furs. *See* Fur.

CHINE. When trimming the broad piece of bone at the end of a loin of mutton or ribs of beef or pork, the butcher is frequently asked to chine it, or saw off the chine-bone. It should be noted that, as this piece of bone will have been weighed in and charged for, it should be delivered with the joint for use in the stockpot or stew.

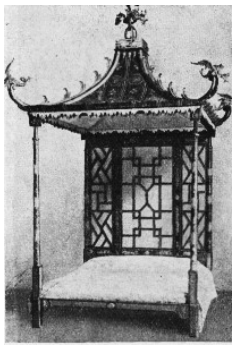
A chine of pork is a favourite joint for roasting; it is the piece between the head and shoulder, and should be carefully jointed before cooking. Or, if liked, the chine may be slightly salted, boiled, and sent to table with a pease pudding and some green vegetable. It needs to be cooked slowly in plenty of water and skimmed thoroughly to rid it of any superfluous fat. Chine of pork should be salted for a few days before it is cooked.

CHINÉ. Satins, taffetas, ribbons, and also cotton materials are described as chiné when printed in a blurred and shadowy-coloured design. The printing is done upon the warp, or lengthwise, threads before the cloth is woven. The weft threads are not printed, and they half conceal the design, tone down the colouring,

and account for the softness of effect.

CHINESE STYLE: In Furniture. The three ornamental features used in Chinese furniture are the cloud form, the dragon, and the fret. All three may occur on the same piece of furniture; the commonest is the cloud form, and it may be found practically alone in chairs, settees, and joss tables. To the unpractised eye the cloud form looks more like a conventional spiral suggested by the snail shell. The dragon and the fret, much conventionalised, are more easily recognized in forms approximating to those their names would suggest, Chinese furniture is commonly made of dark rosewood polished to a patina resembling bone.

The Chinese style in English furniture became popular in England when Thomas Chippendale took it up and exploited it with his Chinese Chippendale furniture, examples of which are rare and valuable. This furniture contains what to English people appear as more typically Chinese features than those already mentioned, many of them obtained from architecture. The principal one is the pagoda form, which Chippendale and other cabinet makers of his day employed in carved chair and settee backs, cabinets, beds, and wardrobes.



Chinese Style. Lacquered and gilt bedstead in the form o£ a pagoda; English, c. 1760
(Victoria & Albert Museum, S. Kensington)

The legs of chairs and tables of this style are fundamentally square in section, but nearly always cut up very elaborately into frets, these frets often having daylight through them, but quite frequently being applied by glue to the solid. Occasionally a conventional rendering of the dragon's head will be seen carved on the terminals of chair arms.

Much of the so-called Chinese furniture used in England in the late 17th and 18th centuries was made of lacquered panels imported into Holland and England and made up into cabinets on carved and gilt or silvered stands. This style had much influence on that of Chippendale (q.v.). *See* Decoration.

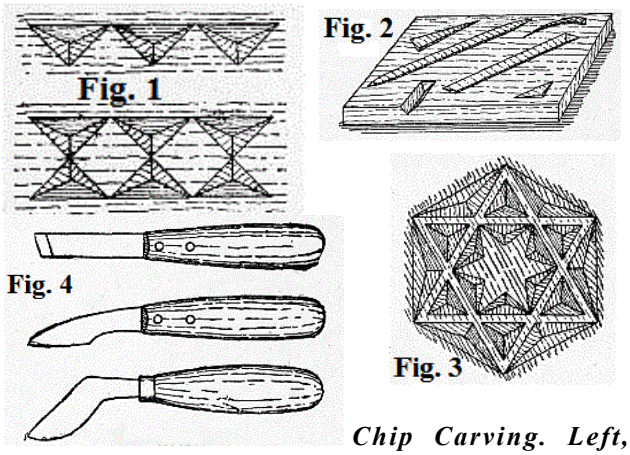
CHINTZ. Being a glazed cotton material, printed in several colours, usually 31 in. in width, and dust-resistant, chintz is suitable for bedroom upholstery. It may be used for linings for hanging wardrobes, and ottomans. Old English designs are best in this fabric with its suggestion of coolness and cleanliness.

Being a stiff material, chintz requires much manipulation in upholstery work, especially when making loose covers. Careful planning is therefore advisable before starting to cut it out. Instead of gathering or folding the surplus material into pleats, as in the case of thin cretonne, a dart should be made by cutting away the material where any fullness occurs and sewing the edges into a fine point.

In laundering chintz it is advisable to add bran water to the first washing water. Bran water is made by boiling for about half an hour ½ pint of bran (placed in a muslin bag) in a quart of water. This addition helps to stiffen the material and to revive the colours of the pattern. Chintz should be starched in boiling-water starch. *See* Upholstery.

CHIONODOXA (Glory of the Snow). A pretty spring flowering bulb suitable for planting in the rock garden or in grass. Luciliae, blue and white, and sardensis, blue, are the chief sorts. The bulbs should be set 2 in. deep in September. Pron. Cio"-nŏ-doksá.

CHIP CARVING. This art, which is done with a sharp-pointed knife, has nothing whatever to do with the shaping of the article, the pattern consisting of simple V-shaped grooves or excavations cut in the surface, just as lettering or figures may be cut in a flat surface of stone. Designs, which are usually geometrical, are produced in this way in order to ornament what would otherwise be plain surfaces.



Chip Carving. Left, Fig.1: Various V-shaped cuts. Above, Fig.2: Carved trenches and triangles adapted from the V-shaped cut. Fig. 3. Geometrical design. Fig. 4. Chip carving knives.

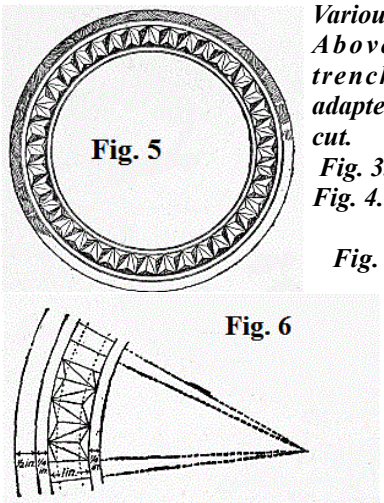


Fig. 5. Circular bread board with carved border. Fig. 6. Detail of pattern which is used in the border.

Examples of various cuts are illustrated in Fig. 2. Before commencing on actual work it is best to practise on waste pieces of wood. Draw pencil lines and try to follow them accurately with the knife or with a chisel. As seen in Fig. 2, the V-shaped trench may have square ends, sloping down at

the same angle as the sides, or may curve or narrow up to a point at the ends. In other cases the excavation may be a small triangle with its three sides sloping to a point at the bottom. A number of these are generally cut in a series forming straight lines of the pattern. Examples are shown in Fig. 1.

More elaborate forms of chip carving are shown in Fig. 3. The method is the same in detail, but the complexity of the design is increased. Two trenches side by side may have only a ridge between, corresponding with a single line on the surface, or there may be a flat between them necessitating two lines in drawing the pattern.

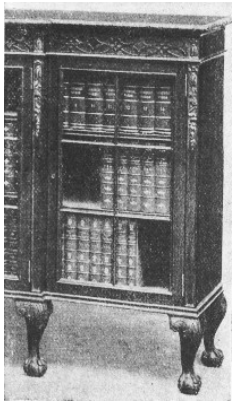
After the design has been drawn on the wood the lines are followed with the knife sloping, so that when at the correct depth the edge of the knife is midway between the surface lines. First one side is cut, and then the slope of the tool is reversed for cutting the other. Instead of reversing the knife it is often more convenient to turn the work round. In a long trench the chip can be removed when the second side has been incised, but in the case of a triangle, or square end of course, a third incision is necessary to release the chip.

Material for chip carving should be evenly grained, quite free from knots or splits, and soft enough to cut easily without imposing too great a strain on the hand while manipulating the knifp. Lime and American whitewood are both excellent for the purpose; they are light in colour, pleasant to handle, and the white wood is particularly amenable to treatment with water stain. Articles adapted for chip carving include wall brackets, medicine and other cabinets, and occasional tables; the turnery department of any large store is a happy hunting ground for suitable subjects. Similar articles are also available with a design ready traced upon them. Varieties of chip carving knives are shown in Fig. 4, the one most commonly employed being that which is bent in relation to the handle.

A straight cut may run with the grain or across it or diagonally, and in either case the knife can travel along it in the direction which suits the grain. In following a curved line it may be necessary to reverse the direction of cutting once or twice to avoid tearing up the grain. In a diagonal cut the knife must travel one way on one side of the trench and come back the opposite way on the other.

The bread board shown in Fig. 5 is a simple example of chipcarving, and may be made by any woodworker. It measures 1 ft. 2 in. over all, and should be cut from ¾ in. or 1 in material, sycamore or beech being suitable. The full size design may be set out from the particulars given at Fig. 6, the main lines running to the centre as shown. It is transferred to the wood by means of carbon paper. The principal lines should be veined. The edges should be finished with a pronounced chamfer. *See* Fretwork; Woodcarving.

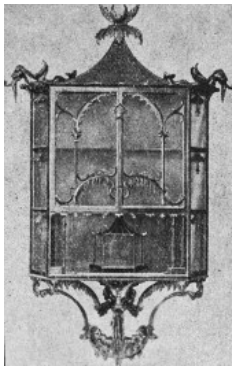
CHIPPENDALE STYLE. Thomas Chippendale, a cabinet maker, who died in 1779, gave his name to a style of furniture which has been generally admired for its beauty of design. Genuine specimens command very high prices, while good imitations are valued.

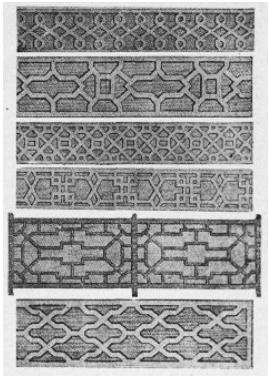




Chippendale Style. Left, portion of mahogany bookcase, showing use of fret. Right, typical armchair with cabriole legs and claw and ball feet (Courtesy of Waring & Gillow, Ltd.)

One authority has laid down the following useful hints for recognizing Chippendale furniture: "Chippendale furniture is made most frequently entirely of mahogany with carved enrichment and no inlay. Its construction is sturdy but its ornamentation often exceedingly light and fragile. Most of it shows skilful exploitation of curvilinear forms. Fretted or pierced ornamentation is common, and in general the style of the decoration follows Louis XV models. In colour old Chippendale furniture is inclined to brown, often becoming deep chocolate with an almost metallic-looking patina. It is never a hot red."





Chippendale Style. Mahogany hanging shelves showing influence of Chinese design, made c. 1750-60. Right, characteristic fret patterns used in furniture decoration. (By permission of the Director, Victoria & Albert Museum, S. Kensington)

The following articles are found in old Chippendale: chairs, stools, settees, commodes, dining tables, side tables, bookcases, card tables, basin stands, wine coolers, mirror frames, writing-tables, brackets, wardrobes, bureaux, secretaires, tallboys, candle stands, clock cases, china cabinets, fire screens, tea caddies, bedsteads, and chests of drawers.

As far as can be ascertained, Chippendale never made a sideboard, as we understand the term, and even his side tables rarely have a drawer in them. Spanish mahogany, which was carefully selected, was used by him for most of his pieces, but some of his designs were carried out in carved and gilt wood. Chippendale's chairs and tables had square or cabriole

legs, the latter not infrequently terminating in a claw and ball foot. Foliage and scrolls, trophies of musical instruments, and fretwork carved out of the solid wood and cut separately—not applied, as was the custom with reproductions—are some of the features which characterise his cabinets. Mirror frames were divided into compartments by scrolls. Figures and animals were introduced.

Chinese Chippendale. After the middle of the 18th century Chippendale varied his furniture designs to fall into line with the prevailing Chinese mode. We have the lattice work backs of chairs, pagodas on tops of bookcases and cabinets, fretwork of Eastern patterns, and other details which give the style to Chinese Chippendale.

Later in the century French designs came into fashion, and Chippendale's work accordingly became more rococo. We have the interlaced riband-backed chairs sometimes with a free treatment of the lover's knot ornament, and generally scrolls and foliage were carved with a lighter hand. *See* Antiques; Chair; Chinese Style; Table, etc; also illus. p. 281.

CHIPS: A Potato Dish. The secret of making chips lies in having the fat so hot that a blue vapour rises from the pan, and in well draining the potatoes before frying. After peeling the potatoes wash them well in cold water, as this washes away the starch and prevents the chips sticking together in the pan. Slice the potatoes lengthwise. Wipe them dry with a clean cloth, then put them in a wire basket, plunging the latter into a saucepan containing sufficient hot fat to cover the potatoes. Fry them until they are crisp and lightly browned, turning occasionally to make sure that both sides are cooked equaly. Lift out the basket, and drain the potatoes in this for a minute before turning them on to a soft paper so that they may finish draining. *See* Potato.

CHIROPODY. The treatment of the feet in order to keep them healthy and comfortable is a very important detail of the toilet, and the instruments employed for the purpose must be scrupulously clean. Scissors, files, scalpels, etc., should be placed in boiling water and then soaked in a solution of disinfectant.

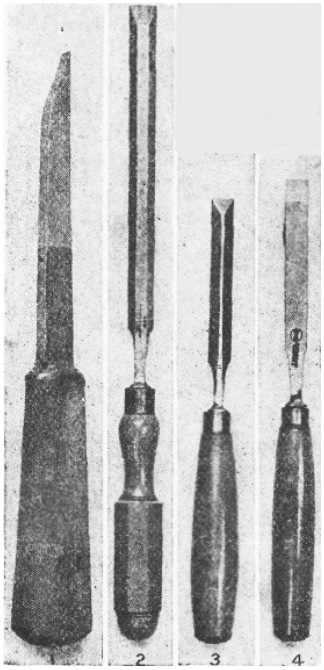
The toe-nails should be kept well trimmed, but they ought not to be cut too short. They must not be cut in a curve like finger-nails, but straight; if cut down at the corners they develop a tendency to grow in at the sides, which is injurious and painful. If an ingrowing toe-nail makes its appearance, a notch should be cut in the free edge of the nail. As the toe-nail grows this notch will fill up, and the pressure of the nail at the side of the toe will be relieved.

If the spot at which the nail is growing in is very painful, a little piece of cotton-wool that has been dipped in boric powder should be gently pressed under the nail. This must be renewed daily, and will raise the nail so that the edge does not cut into the flesh. *See* Bunion; Corn; Foot. Pron. Chi rop-o-dy.

CHISEL: How to Use. In woodwork chisels are most important among the cutting tools. Those known as firmer chisels (Figs. 3 and 4) are most generally employed, and are sold in eleven sizes, from 1/16 in. to 1½ in. wide, the most useful being ¼, ⅜, ½, ¾, and 1 in. and 1¼ in. wide. A variety of the same class is a long, thin paring chisel (Fig. 2), intended for paring or cutting across the grain and working in deep holes. Both are rectangular in section, and are also made with bevelled edges.

Mortise chisels (Fig 1) are extra strong., and made from ⅛ in to ½ in. in width, for cutting mortises. A drawer-lock chisel indispensable for cutting recesses for drawer locks, is an all-steel double-ended tool.

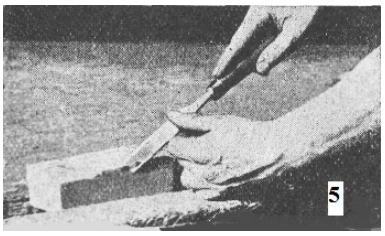
Good chisels should be clean and straight, all bright parts of uniform colour and texture, and the bevelled end straight and evenly ground. The carver shape of handle shown in Figs. 3 and 4 is smooth in contour, and generally made of boxwood. The plain beechwood or ash handles, as in Fig. 2, are larger in diameter, and give a good grip. Mortise chisel handles are more tapered.



Chisel. 1. mortise, 2. Paring. 3. Bevelled edge firmer. 4. Ordinary firmer.

Before a chisel can be used it must be sharpened or set. This is done by first grinding the bevel to a uniformly flat surface and square at the end. When grinding a chisel the grindstone should be turned towards the operator. The chisel should be held firmly and squarely on the stone near enough to the top edge of the latter to allow the tool to be in a nearly horizontal position, with the bevel lying flat upon it. Holding the tool too low, so that the handle points downwards, will cause the water from the stone to run on the hands of the operator. The chisel should be constantly moved across the edge of the stone to wear the latter evenly. It is then rubbed along the face of a good-sized oilstone, at a slightly steeper angle than that of the bevel (Fig. 7). This produces a shorter bevel, terminating in a clean, sharp edge (Fig. 9), but the pressure put upon the tool will have turned up a tiny ragged edge on the flat side. This is removed by placing the chisel flat on its back on the oilstone and rubbing it off (Fig. 8). A few strokes on both sides, putting on little pressure, will result in a perfectly clean and sharp edge. Chisels must be maintained in this state by rubbing on the oilstone from time to time as they become dull or blunt.

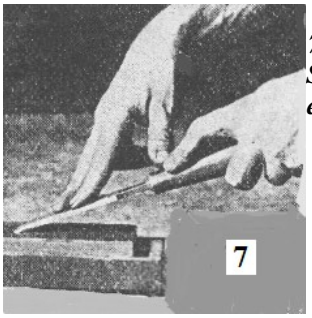
The quality of work done with a chisel depends upon the correct handling of the tool. However good a chisel or sharp the edge, no satisfactory work can be done unless the handle is properly held. Generally speaking a chisel should be used with both hands. The right grasps the handle and directs the course of the tool, and also supplies the energy for its propulsion (Figs. 5 and 6). The left is used to grasp the blade near to the cutting part further to control and direct the cut. By far the greatest amount of work is done in one of four ways. These are: chiselling with the grain of the wood, paring across the grain, paring across the end grain and at right angles, and by oblique cutting partly across and partly with the grain.



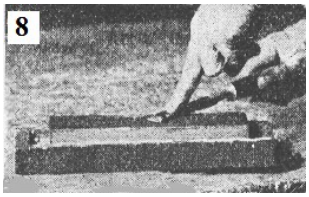
5. Horizontal chiselling.



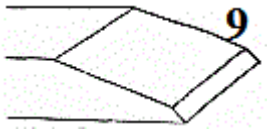
6. Vertical work.



7. Sharpening edge.



8. Removing rough edge after sharpening.



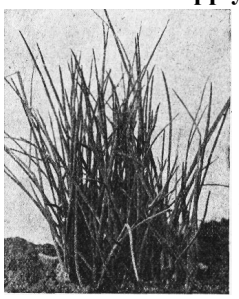
Chisel. Fig. 9. Enlarged view of the cutting edge when correctly set, showing the smaller bevel formed by rubbing the edge on oilstone.

In chiselling with the grain the tool is held at a small angle and simply propelled forwards, taking care not to let it dig in, by making judicious use of the left hand. In paring horizontally across the grain, work from one side of the job towards the centre; reverse the job and work from the other side and finally clean up the surface flat and true, making diagonal cuts to aid in the flattening. Test the work with a square at frequent intervals.

When paring across the end grain the tool is held upright and the cutting edge applied near the end and side of the wood, starting the cut with a slight side-tilt on the chisel, and bringing it up straight as the cut proceeds. The right shoulder should be close to the top of the chisel handle, and the whole strength of the arm, shoulder, and back put into the cut. One should never attempt to cut off too much at a time, repeated light strokes produce better results. In oblique paring always work downhill—that is, cut with and across the grain. Do not attempt to cut against or up the grain, as the result will be ragged work and splits in the wood.

The art of using the chisel is only acquired by practice, and the amateur is advised to begin with simple jobs, such as the shaping of a hexagonal piece of wood, say 6 in. across the flats and 1 in. thick. If accurately chiselled to shape, and square and true on all its faces, this will be ample evidence that he has passed his novitiate. ***See*** **Amateur Carpentry; Bench; Wood Carving, etc.**

CHIVE: Its Culture and Use. The plant grows in a thick cluster of small bulbs with grass-like, hollow leaves. If an old clump is pulled to pieces in spring, and the separate plants are set a few inches apart in a line in a fairly fertile soil, fresh clumps are soon formed. Where no old clumps are available, seed should be procured and sown, as if for onions (q.v.). The clumps require to be renewed about every third year. The leaves are cut close to the ground occasionally in order to ensure a full supply of young ones.



Chive. A plant of chives, valued for its mild onion flavour in salads and soups.

Use in Cookery. The chive is a very useful variety of the onion tribe. Though small, it has an exceedingly powerful flavour and should be used in cookery with caution. The young leaves are often minced, and when freshly cut the flavour is delicate and forms an important ingredient in French salads. They are also used as a pot-herb, and chive sauce is much liked with roast meat or grills.

To make this sauce, put a gill of fresh breadcrumbs into a saucepan with 2 oz. butter. Cook them over the fire until a pale gold, when ½ pint stock and 3 tablespoonfuls finely minced chives should be added. Stir while it boils for 5 min., season it with salt, pepper and a tiny dust of grated nutmeg, and it is ready to serve.

CHLORAL or Chloral Hydrate. On account of its soothing effect on the nerves and power of inducing sleep, chloral or chloral hydrate is often prescribed. Nevertheless, it exercises a depressing effect on the heart, and must be used with the greatest caution; if taken for any length of time it may result in a chloral habit that will be very difficult to shake off. It should not be taken by anyone suffering from kidney disease, and never except on a physician's prescription.

CHLORODYNE. For relieving pain chlorodyne is a proprietary remedy very commonly used. It is useful in colic either with or without diarrhoea, and when this appears to be due to indigestible food a dose of castor oil should be given at the same time. It may also help an irritable dry cough. It should not be given to infants or children without medical advice. The

symptoms of poisoning are those of opium, and the treatment is the same. *See* Poisoning.

CHLOROFORM. This drug is widely used in medicine on account of its properties of inducing loss of consciousness and preventing pain and shock during surgical operations or in childbirth.

The compound tincture of chloroform and morphine is somewhat similar to chlorodyne, and is used in the same way. The dose is from 5 to 15 minims. Chloroform water is a pleasant diluent for other medicines, as it has a somewhat pungent odour. The dose is ½ fluid oz.

Chloroform liniment is frequently used as ABC liniment, which is a mixture of the liniments of aconite, belladonna, and chloroform. This may be rubbed on the part, or it may be applied on lint covered over with gutta-percha tissue. It may be used in muscular rheumatism or in neuralgia.

Spirit of chloroform may be used in flatulent dyspepsia, and may be combined for this purpose with a third of a teaspoonful of bicarbonate of soda dissolved in a little water. It is also used in cough mixtures. A single dose is from 30 to 40 minims; a repeated dose is from 5 to 20.

CHLOROSIS. Women and girls who follow indoor occupations are liable, under certain conditions, to suffer from chlorosis, which is a form of anaemia and is also known as green sickness. The patient becomes breathless on exertion, as in climbing stairs. The complexion may not show any marked change, but more frequently it has a greenish tinge. Constipation and digestive troubles are common. Examination of the blood shows a large diminution of its colouring matter, haemoglobin. The treatment consists in the administration of iron, a convenient form being freshly made Blaud's pills, increasing from one to three, thrice daily, and frequent doses of Epsom salts. *See* Anaemia.

CHOCOLATE MAKING AT HOME

Recipes for Some Popular Varieties of Confections

Other articles dealing with Sweet-making include Fudge; Sweets; Toffee. See also Cocoa; Decoration; Icing; Sugar, etc.

With additional cocoa-butter and fine sugar carefully incorporated cocoa becomes chocolate. Without the sugar it is known as unsweetened block cocoa, of which only the best should be used. Table cocoa must not be used for sweetmaking.

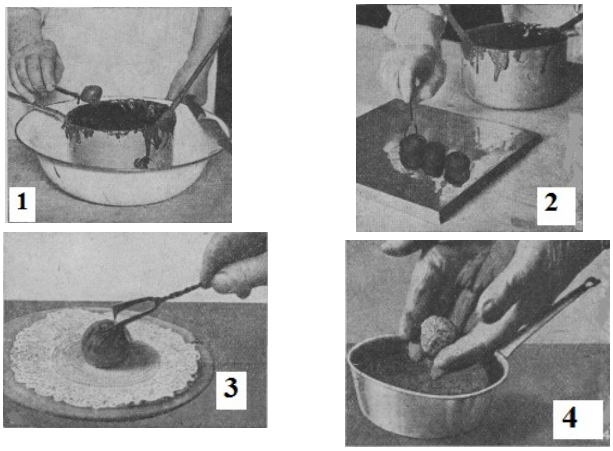
Although impossible to make first-rate chocolate without machinery, a good eating chocolate may be prepared as follows. Put 1 lb. of unsweetened block cocoa in a small pan and place this inside another containing water. Slowly melt the cocoa over gentle heat, stirring well, and taking care that no water comes over. Add 1 lb. icing sugar, stir while this melts, and then thoroughly mix the two together. Run in 4 oz. melted cocoa-butter, and beat the mixture vigorously.

The contents must not be allowed to rise above blood-heat. Remove the pan from the warm water, add essence to taste, vanilla, kirsch, maraschino, etc., and keep stirring and beating till the chocolate becomes almost solid. Allow it to stand for several hours, then remelt it as required, never letting it get much over 88° F. or 31° C.

If the chocolate is to be poured into tin moulds, these must be warmed to be of the same temperature as the chocolate, and should be clean and brightly polished to get nice glossy sweets. Once moulded, the chocolate should be cooled as rapidly as possible; otherwise it will be spotted and dull in appearance.

Milk chocolate is prepared as ordinary chocolate, but with the addition of 4 oz. full-cream milk powder to the amount mentioned above.

Hazel nuts, shelled, blanched, and well roasted in the oven, are used for nut chocolate. The hazels, while still slightly warm, should be stirred through the chocolate just before pouring, which in this case should be as nearly as possible at its setting point.



Chocolate Confectionery making. 1. The cream or other centre is dipped in liquid chocolate, and then, as in 2, placed on tin to be decorated with a whirl, made, as in 3, with a little chocolate twisted round with a sweet fork. 4. In making a truffle the chocolate and whipped cream are mixed; the sweet is then rolled in the hands and dipped in chocolate powder.

A great variety of chocolates are prepared by dipping sweets, known as centres, in a specially prepared chocolate. These centres, which may be either of a hard or soft nature, are made of fondant, variously coloured and flavoured, and also of fruit paste, caramel, nougat, marzipan, and other mixtures. Effec-tive decorations can be devised from angelica, artificially coloured nuts and sugars, and crystallised flowers.

The prepared chocolate required for dipping is known as couverture, and it has to be melted down with the greatest care, for therein lies the secret of success. The correct temperature, too, when once attained, must be preserved throughout. With too hot a couverture, the sweets become grey; if too cold, the couverture is muddy, the dipping slow and tedious, the

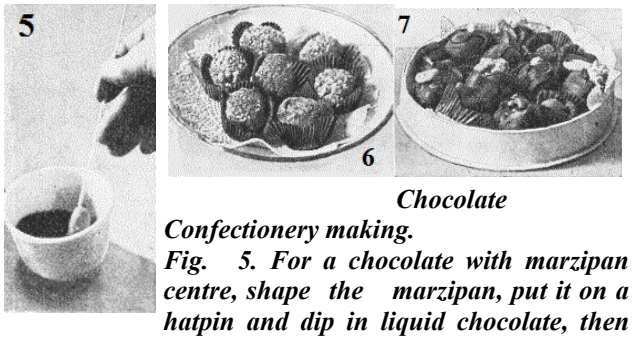
coating heavy, and the finished sweet of unattractive appearance.

In dipping centres, wire forks or loops should be used. The pan with the chocolate, set in another containing warm water, should be in front of the dipper, with the centres on the left and highly glazed papers or brightly polished tins, on which to place the finished sweets, on the right. The centre is dropped into the chocolate with the left hand, and picked up with the fork in the right; the fork is tapped on the side of the pan to spread the coating evenly and remove any surplus, then drawn along the side to prevent "feet" on the sweets, and the covered centre laid on the paper or tin. Unless to be otherwise decorated, each sweet is ornamented with a twirl or line, made with the fork as the dipped centre is laid on the paper. All manner of centres may be dipped thus.

After each of the centres has been dipped, the chocolate in the pan should be well stirred, otherwise there will be layers at different temperatures and the sweets will be streaky. Couverture which runs very freely is too warm. It should set almost immediately the sweet is placed on the paper and show a gloss. The dipping should be done in a dry room, with a temperature of about 60° F. Only the best cocoa-butter should be used.

Almond centres are prepared by shelling ½ lb. sweet almonds and putting them on a baking-tin in the oven until they are slightly browned. When they are quite cold, dip them in couverture, and leave them on an oiled tin to harden.

Chocolate truffles are rich, soft chocolate centres dipped in grained chocolate or dark, unsweetened chocolate powder. For each ounce of chocolate allow one tablespoonful of cream and a teaspoonful of coffee or vanilla essence. Mould the truffles with two teaspoons and toss them in the grained chocolate until they are coated; finish by placing them in fancy sweet cases.



Chocolate Confectionery making.
Fig. 5. For a chocolate with marzipan centre, shape the marzipan, put it on a hatpin and dip in liquid chocolate, then plunge quickly into dry chocolate powder.
Fig. 6. Home-made chocolate truffles. Fig. 7. Box of home-made chocolates of assorted shapes.

Nougat centres are prepared by putting 6 oz. strained honey and 2 oz. glucose into a small pan, and setting the latter inside another containing hot water. Stir the mixture till it is quite hot. In another pan boil 1 lb lump sugar with ½ pint water, and also a pinch of cream of tartar, to 290° F. While this is boiling beat up the whites of three eggs to a stiff snow, which should just be ready when the sugar reaches the requisite degree. Add the boiling sugar to the egg whites, stirring vigorously all the time.

Next add the honey and glucose, place all together in a double boiler (one large pan inside another will do), and keep on heating gently and stirring vigorously till it becomes quite stiff. Add a few blanched almonds and glacé cherries, warmed and cut up, and pour the whole into a tin or wooden frame lined with wafer paper. Cover it with wafer paper, place a board on the top, then a heavy weight; let it remain thus for 24 hours, then cut it up.

Orange cream centres are made by adding to the grated rind and juice of a carefully selected, deep-coloured orange sufficient icing sugar to make a stiff paste. Add to this a ½ teaspoonful of citric acid dissolved in a few drops of water, and mix all well together. Form the mixture into small balls, or other shapes, and dip them.

To prepare Turkish delight centres, dissolve very slowly together 1 oz. of ground gelatine, 4 oz. of glucose, 1 lb. of honey, the juice of one lemon, and a full ½ pint of warm water. Bring these carefully to the boil, stirring all the time, and boil for 10 min. Flavour and colour the mixture according to taste, and put it out into bright tins, rinsed out with cold water. When cold cut it up into squares.

Marzipan squares are made by dividing ¾ lb. of warmed almond-paste into three parts, leaving one white, and colouring the others pale yellow and pink. Flavour the white with vanilla, the yellow with lemon, and the pink with rose or raspberry. Roll them into sheets, and lay one above another. Cut them up into squares and set them out to dry before dipping.

Fruit Centres. To prepare fruit-paste centres, bring to the boil a little apricot jam, stirring it all the time. Remove it from the gas or fire, mix in an equal quantity of finely-cut preserved pineapple, and drop the mixture with a spoon in small drops on some glazed paper. When these are set, stick them together in pairs with stiff jam or jelly, and allow them to dry thoroughly.

Chocolate fruit dominoes can be made by finely chopping a cupful of shelled walnuts, half a cupful of figs, and the same quantity of stoned dates, and adding to them the grated rind of an orange, a tablespoonful of orange juice, and a square of melted, unsweetened chocolate. Turn the mixture on to a board sprinkled with powdered sugar, and roll it out to one-third of an inch in thickness. Cut the paste into the shape of dominoes, using a sharp knife; coat these thinly with melted chocolate, and decorate with small pieces of blanched almonds.

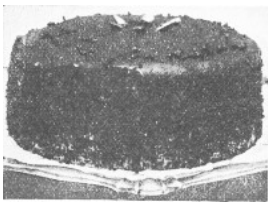
The ingredients required to make chocolate caramels are ¼ lb. chocolate (scraped fine), 1 cupful brown sugar, 2 cupfuls treacle, 1 cupful milk, and 1 piece butter the size of an egg. Boil these in a porcelain saucepan, stirring all the time, till the candy hardens when dropped into water. This should take about ¾ hour. Stir in 1 tablespoonful of vanilla extract when the

saucepan has been taken off the fire and the mixture has stopped bubbling. Pour in a shallow, oiled tin; leave candy to set and mark into squares.

CHOCOLATE: The Beverage. When possible, this should be made with a French chocolatière, which, by reason of a small beater device that passes through its lid, enables the chocolate to be easily whisked while cooking. A good drinking chocolate can be made by grating two large bars of plain chocolate into a pan, and adding to them 1 heaped tablespoonful of white sugar and a teaspoonful of the best cornflour or arrowroot. Mix these ingredients smoothly with a breakfastcupful of water, and let the whole boil gently for 5 min. Then stir in 1 breakfastcupful of milk, bring it to the boil, and serve it in cups, adding, if liked, a spoonful of whipped cream on the top of each. *See* Cocoa.

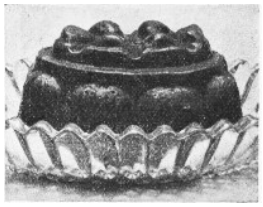
CHOCOLATE BISCUIT. These are ex cellent for afternoon tea. To prepare them, dissolve 2 oz. grated chocolate in a small tablespoonful of water. Put 2 oz. margarine in a basin, work it up with a wooden spoon, and add 3 oz. castor sugar, beating the mixture to the consistency of cream. Mix in the dissolved chocolate, beat in an egg, then add the vanilla and lastly 6 oz. sifted flour, stirred in lightly. Turn the mixture on to a floured board, and roll it out into a thin sheet. Cut it into shapes, and bake these on a greased tin in a moderate oven for 12 to 15 min.

CHOCOLATE CAKE. First of all ¼ lb. each of butter and castor sugar are creamed together. Then the yolks of 2 eggs are beaten in, 3 oz. each of grated chocolate and flour, and ½ teaspoonful of baking-powder added, and finally the whites of the 2 eggs beaten to a froth. The mixture is baked in a moderate oven for 1 hour and may be covered with chocolate icing if desired, top and sides sprinkled with chopped nuts and centre decorated with pistachio nuts.



Chocolate Cake, covered with chocolate icing and decorated with pistachio and other nuts.

CHOCOLATE CREAM MOULD. A favourite party sweet is made from 1½ oz. grated chocolate, 2 oz. sugar, ½ oz. gelatine, and ½ pint of slightly whipped cream.



Chocolate Cream Mould, set in an ornamental shape and turned out in a glass dish.

Put the gelatine into a saucepan with enough water to melt it, and add the chocolate and sugar, together with a little milk, stirring the whole till dissolved. Whip the cream slightly, mix it with the rest of the ingredients, after they have cooled slightly, and put all into a wet mould to set.

CHOCOLATE ÉCLAIR. These iced cakes are made with ½ pint water, 3 eggs, 4 oz. flour, 1 oz. sugar, 2 oz. margarine, a pinch of salt, a little whipped cream and some glacé icing. Put the water, salt, sugar, and margarine into a saucepan over the fire, and, when they boil, add the flour. Stir the mixture until it becomes a soft paste and leaves the sides of the sauce-pan. Then take the pan from the fire and add the eggs separately, beating each in well. With a forcing tube lay the paste out in shapes measuring about 4 in. long on an ungreased baking-tin. Bake these for 20 min. in a moderate oven, and when they are cold split them open at the side and fill them with whipped cream sweetened and flavoured with vanilla. Ice the top of the éclairs with glace icing. This quantity is sufficient for about ten éclairs.

CHOCOLATE ICING. In making a simple chocolate icing, ½ lb. icing sugar and 3 oz. grated chocolate are mixed together with 2 tablespoonfuls of hot water or milk. A glacé for fancy cakes requires more sugar. Cook 2 oz. grated vanilla chocolate in ¼ pint of water in a pan, then add 1 lb. icing sugar with 3 tablespoonfuls warm water. The mixture should be poured warm over the cakes.

CHOCOLATE PUDDING. A baked pudding requires 1 pint milk, 3 eggs, 2 tablespoonfuls each grated chocolate and castor sugar, a few drops vanilla, and 1 oz. cornflour. Put the grated chocolate in a saucepan with ¼ pint of the milk, and boil the two together until they form a smooth paste. Then mix the cornflour with 2 tablespoonfuls of the cold milk, and add it, with the rest of the milk, to the chocolate, and stir the whole till it boils. Draw the pan to the side of the fire and beat up the 3 yolks of eggs and stir them into the cooled mixture, flavouring with the vanilla. Pour the whole into a buttered pie-dish, bake ½ hour, and then beat up the whites of 2 eggs to a stiff froth. Add half the sugar lightly, and heap it over the top of the pudding, sprinkling the rest of the sugar over all. Bake the pudding very slowly.

CHOCOLATE ROLL. Cream together 3 oz. each sugar and butter, and sieve together ¼ lb. flour and 1 teaspoonful baking powder. To the former mixture add 3 eggs, beating each in separately, and lastly fold in the flour and baking powder, together with a little milk if required. Pour the mixture into a shallow greased tin and cook for 10 min. in hot oven.

In the meantime, put ¼ lb. jam into a saucepan to warm, and when the sponge is ready spread it with the jam and roll it up immediately. When the cake is cool ice it with chocolate butter prepared with ¼ lb.

butter, 9 oz. icing sugar, 2 oz. grated chocolate, 2 tablespoonfuls milk, and a little vanilla flavouring. Cream the sugar and butter and add the chocolate (dissolved in the milk) and a few drops of vanilla. Pour the icing into an icing bag and force it from a shell-shaped icing tube in straight lines from one end of the roll to the other.

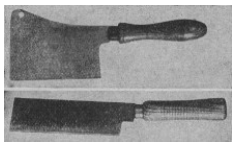
CHOKING. One of the commonest causes of choking is when a fish bone gets stuck in the throat orwhen a morsel of food goes down the wrong way. Artificial teeth may get fixed at the back of the throat or in the gullet, obstructing the air passages; and fragments of children's toys have been a source of danger.

By taking a sudden deep breath when there is something in the mouth the object is sometimes drawn quickly into the larynx, or even farther, into the trachea or bronchi. The result is a violent choking fit, in which the face grows red and swollen, with violent cough and difficulty of breathing. A child so affected may be held head downwards to ensure that the foreign body shall not proceed farther down the windpipe. If this causes vomiting, no harm, but perhaps good, may follow; nevertheless, the accident is sometimes accompanied with real danger, and it may become necessary to send the patient to hospital to have the object removed by the aid of an instrument called a bronchoscope.

Unless the patient is unconscious he should be made to kneel on a chair with the head downward and the body weight supported on the hands on the floor. In this position he should attempt to cough the obstruction out of the windpipe, while at the same time he should be given a few smart blows between the shoulder blades. If these means are not sufficient to remove the obstruction, the mouth should be prised open by some hard object thrust between the back teeth, such as the handle of a spoon guarded by a handkerchief. Then someone should thrust his forefinger well to the back of the throat as far as possible, and sweep it across the base of the tongue in an attempt to dislodge the obstruction. If there is any difficulty in affording relief, the doctor should be sent for at once. Artificial respiration may be necessary if breathing has ceased. *See* Artificial Respiration; Asphyxia.

CHOP: How to Cook. The accepted meaning of a chop is a small cut of mutton, lamb, pork, or veal taken from the loin. Neck chops are very occasionally spoken of, but they are more correctly alluded to as cutlets (q.v.). When cut from the tail end it is known as a chump chop. The texture of the chump end is excellent, but the proportion of bone is greater. Chops cut from a very fat loin are wasteful, and as the price is high a good butcher will trim them carefully. They are best grilled or broiled. The method of frying them is much used, but it is less excellent in flavour. With grilled chops serve potato chips or straws, and maitre d'hôtel butter. Lamb chops are cooked as those of mutton; they are more delicate in flavour, but should be well done, while many people prefer a mutton chop slightly underdone. Stewed chops make a very savoury and wholesome dish. Very little fat should be left on. For invalids, steamed chops are more suitable than grilled; serve simply, with their own cooking juice and a dust of seasoning. *See* Grilling; Mutton.

CHOPPER. Two types of chopper are in general use—the long, narrow pattern used for chopping wood, and a broader-bladed kind for chopping meat. A French kitchen knife, however, with its fine point and deep hilt, is better than the straight-bladed knife, and two or three of these are most desirable implements to have in the kitchen.



Chopper. Shown is the broad-bladed implement used for chopping meat; below, the narrow pattern employed for wood-chopping.

All that a chopper requires to keep it in good order is an occasional grinding. The edge can be kept in good trim by whetting it on an oilstone slip. A wipe over with an oily rag prevents the blade going rusty; a loop round the handle makes the chopper easy to hang up.

The correct method of chopping meat into small pieces is to hold the point of the chopper or knife firmly down on the chopping board with the left hand, and with the right work the handle up and down, now and then collecting together and turning over the food being chopped with the left hand, thus ensuring speed. *See* Parsley; Suet.

CHOPPING BOARD. Desirable qualities in a chopping board are rigidity, solidity, a smooth surface, and toughness to resist wear. It should, therefore, be made of a solid piece of hardwood, such as beech, birch, or maple. Convenient sizes are 14 in. long. 12 in. wide, and 2 in. or more in thickness. Four holes about ¾ in. diameter drilled near the corners on the under side of the block and filled with ordinary bottle corks, leaving ⅛ in. protruding, ensure the board resting firmly and, by providing a certain amount of resiliency, facilitate the chopping.

Chorea. This is the medical name of the complaint known as St. Vitus's Dance (q.v.).

CHOW CHOW. A clever and kind-hearted dog, devoted to his owners and endearing himself to their children, the chow is a spirited guardian of the house and a distinct ornament to it. With his handsome coat of dark red, black, yellow, white, or blue, he wears a fur ruff around his neck, and the plume that serves for a tail is curled far over his back. His small, pointed ears are carried stiffly erect, his dark eyes are almond shaped, muzzle broad, and tongue blue-black. His weight is about 40 lb.; that of his mate a few pounds

less. *See* Dog.



Chow Chow. Champion of the Chinese breed of dog.

CHOWDER. Cod or fresh haddock may be used, 1½ lb. being cut up into small pieces with ¼ lb. each of peeled onions and potatoes, cut in ¼ in. cubes. Trim and cut 3 oz. of pickled pork into the 1 same sized pieces, and fry the pork and onions until they are a light brown. Put potatoes, fish, onions and pork in a casserole in layers, adding 2 sliced tomatoes and seasoning and powdered herbs between each layer. Potato should be on the top.

Pour in 1 pint of stock, cover it and simmer for 20 min.

Heat ½ pint of milk and break into it three water biscuits. Let these stand for 3 min. Stir into the chowder, boil it once, and serve it in the casserole.

CHRISTENING. This term is used, especially by certain Nonconformist bodies, for the religious rite more generally known as baptism.

Christening Robe. The usual length is 44 in., and 3 yards of double-width material is sufficient. An effective robe can be made by utilising a piece of Brussels or Honiton lace in panel form from the yoke to the edge of skirt. Tiny tucks and insertion finish the rest of the skirt. A beautiful gown can be made with self-embroidery—a fine spray of flowers extending the full width of the front, and tapering up to the yoke. Smaller sprays may be used in a running pattern at the foot of the skirt. An insertion of fine Valenciennes lace, to which is whipped a tucked and lace-edged frill 4 in. in depth, is a better finish than a hem. The robe will sit better on the infant if the skirt is gathered into a yoke 3 in. in depth. This can be self-embroidered, or trimmed with tucks, lace motifs, or insertion. The sleeves should be rather full and reach to the wrist, as they will then cover a woolly vest or small coat. They can be finished with a narrow beading or insertion edged with lace. *See* Baby.

CHRISTMAS AND ITS MERRYMAKING

Preparation of Seasonable Fare and Suitable Decorations

Further information will be found in such articles as Artificial Flowers; Cracker. See also Children's Party and entries on Card Tricks; Conjuring

Preparations for Christmas are a serious or joyous matter according to the spirit in which they are tackled. It is far better to give simpler presents, fare, decorations and general entertainment than to attempt expensive elaboration, which will not make for happiness owing to strained nerves or over-taxed resources.

Most children love assisting with anything to do with Christmas festivities; also they like preparing presents, secret shopping and doing up their parcels. In the latter connexion the continental habit of packing up gifts in special coloured and patterned papers, with tinsel or holly-sprigged ribbons and attractive seasonable labels and seals, is one which delights children, and these little extra bits of decoration cost only a few pence. Par-cels sent out or arriving in Christmas wrappings with merry labels bearing the instruction "Not to be opened till December 25," are much more exciting than drab brown paper packages.

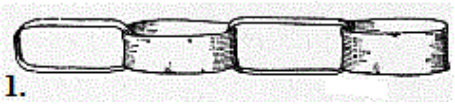
The modern child is apt to be incredulous of Santa Claus and of Father Christmas himself but is willing to do a little make-believe for the occasion. Therefore, in many households on Christmas Eve, when small people have given up the futile effort to lie awake until the arrival of Santa Claus, the stocking is filled and Christmas gifts are placed on the table by the bedside. This also has the advantage of keeping children busy until the elders are prepared to start the day: whereas, if the gifts are to be placed on the breakfast table, the whole house is astir before dawn. It is usual, especially where there are children, to have the Christmas dinner served in the middle of the day. This has advantages when evening refreshments have been cleverly planned to take the form of a help-yourself supper of ready-prepared dishes, as it allows the staff to have the evening off with their friends. If the Christmas party is a family gathering, probably after dinner games suitable to all ages will be included in the programme. Everyone enjoys a few conjuring tricks, if the host is able to do a short series of these. In addition it is well that a few records of popular dance successes should be forthcoming for the gramophone.

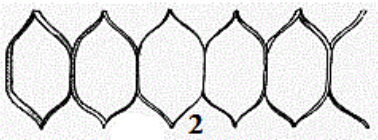
The Christmas menu may be simplified to grapefruit, consommé, flavoured and coloured by tomato and served in cups, roast turkey— chosen with due consideration for the size of the party—stuffed, with chestnuts in the body and sausage meat in the crop, accompanied by cranberry sauce, celery, a salad and baked potatoes, and followed by those essential features of a Christmas dinner, plum pudding, mince pies and special dessert. It is often found better to carve the turkey in the kitchen beforehand, arranging it nicely on a dish to be kept hot until served. Some-times roast goose is preferred to turkey. If not too fat, garnish the goose with chipolata sausages and serve with apple sauce.

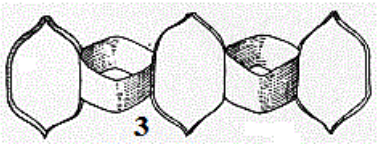
The table should be charmingly laid and decorated with as much colour in the scheme as taste permits. The big bowl of fruit, surrounded by scarlet or silvered candles, in glass or silver candlesticks, and by smaller sweet dishes with brilliantly coloured crackers interspersed, can be recommended where flowers are hard to obtain. A small frosted Christmas tree on a centre-piece of silver paper, outlined with holly leaves, or a snow man guarding a big bundle of crackers may be liked. If a tablecloth is used it should be a festive one, or mats of lace are always right, or an embroidered

runner is suitable for a long, narrow table. Place cards and menu holders carried out in seasonable designs add a finishing touch of gaiety.

Christmas Decorations. Some people like to decorate their houses throughout, others are content with an arrangement of evergreens in dining room or hall and sprigs of holly for the table.







Christmas. Figs. 1-3. How chains and festoons for decorations can be made of coloured paper.

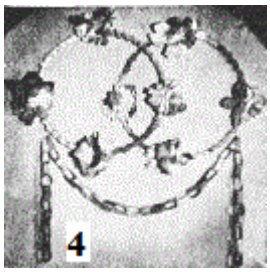
With many decorations about great care should be taken to see that there is no danger from the fire or any candles. The latter should only be used for the table or high up on a chimney piece out of possible danger of being knocked over. Wall decorations have the advantage of not encroaching on the space for dancing or games.

Holly ropes are effective when hung in festoons along the picture-rail or swung across the room. The foundation of one of these ropes is a length of stout cord. Small sprays of holly are tied to it with fine string, the leafy end of one piece completely hiding the stalk of another. Such a rope should be fastened securely to the top of the picture-rail, for it will be heavy. Paper bells and ornaments of all kinds may be hung from the holly garlands. The effect is improved if a rope of tinsel is twisted and looped around it.

The simplest garlands to make at home are paper chains, three different kinds of which are shown here. Bundles of coloured paper, about 8 in. by 1-1½ in., can be bought to make them. The simplest chain (Fig. 1) is made by pasting one strip of the paper into a ring, running another through it, and pasting that also into a ring, and continuing thus until a chain of the required length is made.

Another chain is made by pasting a sheet of coloured paper about 8 in. wide to form a tube and pressing it flat, and then cutting it across into strips about 1-1½ in. wide, each strip being a flattened ring. In the middle of one put a small dab of paste, then press a second upon that; paste that also, and stick another flattened ring upon it, etc. Fig. 2 shows a chain made in this way, in which each ring has been placed exactly over the one before; Fig. 3, one in which the rings are made to lie across each other. Twelve rings thus pasted together will, stretched out, make a chain about 3 ft. long. These chains possess an advantage over those shown in Fig. 1, as they fold up into small space and thus can be put away without fear of breaking.

Paper garlands and festoons are also bright and cheerful, hung from wall to wall. The prettiest effect is obtained with "love-hoops," as shown in Fig. 4, made with chains, bunches of coloured paper cut into strips and paper flowers. The hoops are small wooden ones twisted round with crepe paper. They are held up at intervals by wands, covered with twisted paper, topped by big brushes made of coloured paper cut in short strips. *(See* Fig. 5.) These decorations are in place of pictures that may be on the walls. A bunch of brightly coloured balloons depending from any central electric lighting fixture is effective. The paper chains and festoons can be held in place by drawing-pins. If the room is lit by gas or lamps the greatest care must be taken that no paper decoration is hung either directly over the light, or near enough to be swung towards it by a sudden draught. The entrance hall may be decorated with holly and a bunch of mistletoe hung from the central light.



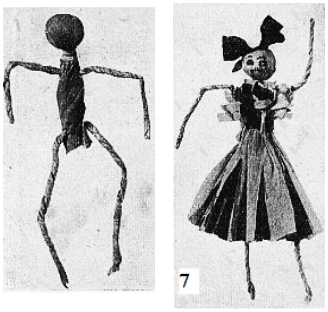


Christmas. Fig. 4. Wall decoration of paper-covered hoops joined by chains. Fig. 5. These are held up at intervals by wands topped by big brushes made of strips of coloured paper.

An example of a paper figure for table decoration is shown in Figs. 6-7. Crinkled paper, paste, and flower wire are all that are needed to make it, and with a little ingenuity the costume can be amusingly varied. To make the head roll a ball of paper about the size of a hazel nut and twist over it a piece of paper 6 in. square. Paste a narrow strip of white paper round it to form the neck, and keep the twist tight. The loose end of the paper will form the body. Having cut a strip of paper, 2 in. wide and 4 in. long, the elastic way of the paper, twist it up very tightly to form a rope. With a stiletto or sharp-pointed scissors make a hole through the body just below the neck. If the rope of paper is inserted into the hole at one side and twisted, it will pass right through and form the arms. The legs are made similarly from a strip of paper the same width and about 5 in. long, and are run through the body 1 in. below the arms. The doll is then made as in Fig. 6, ready for dressing.

For the skirt, cut lengths, 9 in. by 4 in., of two colours of the crinkled paper. Paste the ends of each together and put one of the rings so made inside the other. Slit the top of both narrowly to a depth of about ¾ in. to form the fringe, then slip in the little figure and gather the skirt closely and evenly round it, so that the base of the fringe comes just below the arms. Bind it round firmly with a doubled strip of paper about ½ in. wide to make the belt. Press the fringe down so that the under colour shows, and stretch out the bottom of the skirt to its fullest extent. The top skirt should now

be cut up nearly to the waist, into strips ½ in. wide. All that is needed to complete the figure is a bow of narrow paper pasted on the head and the face inked in. Such little figures made without legs can be mounted on sticks.



Christmas. Figs. 6 and 7. How to make and dress a doll for Christmas tree or table decorations.

Christmas Tree. For the children the most exciting decora-tion is often a Christmas tree. Sometimes this is of cut out painted plywood set into an imitation plywood tub. Toys, etc., are hung on the tree by means of tiny screwed-in hooks, and the tree is set flat against the wall. It obviates mess, but is rather a poor apology for the regulation fir.

With any candle-lighted Christmas tree there is risk of fire, for which season a long pole with a sponge at the end should be kept ready with a pail of water to extinguish the candles as they burn down. Because of this risk, many people prefer the tree lighted with coloured electric bulbs.

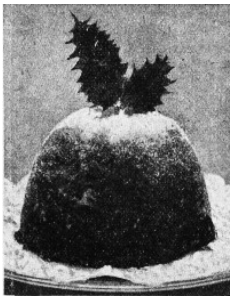
A fir tree standing about 6 ft. high takes two persons several hours to trim effectively. Ornaments made from silver, gold, and coloured paper should fill up odd spaces and trim the tub, or whatever the tree is placed in. Special shining ornaments are sold by the dozen and can be wired on the branches effectively, with chocolate animals in silver paper, baskets of sweets, little dolls, miniature furniture, crackers, and light wooden toys.

On the apex of the tree the Angel of Peace is symbolised as a fairy doll, with glittering crown and wings and spreading gauze skirts. A pretty touch is to let strands of tinsel fringing fall apparently from the doll's hands to festoon the branches. The girls generally draw lots for the fairy doll at the end of the proceedings. Large toys and presents, if to be given at the same time, should be placed at the base of the tree. The tree should be lighted up a few minutes before the children are admitted, and all other lights turned off. In many houses it is kept until New Year's Eve, when it is lighted up again about a quarter of an hour before midnight to welcome the New Year.

CHRISTMAS CARDS. There are not many house- holds that do not send out and receive a few Christmas cards. They are often elaborate and beautiful, but the personal card with printed name and address of sender, either specially designed or chosen from stock patterns, is increasingly popular. Miniature calendars are also frequently used. If the envelopes are left unsealed, Christmas cards can be posted at printed paper rates.

CHRISTMAS PUDDING. The basin in which a plum pudding is boiled must be quite dry and well greased. Fill it up well and tightly with the pudding mixture, and tie down over it a scalded and floured pudding-cloth, leaving a fold to allow for swelling.

A pudding for six or more persons requires boiling for at least 8 hours. Small ones require less in proportion, 3-4 hours sufficing for a 1 lb. pudding; but, in any case, long boiling does no harm. If several puddings are to be cooked in the same saucepan, put them into boiling water at intervals of a minute, so that the water is not cooled too much, and replenish with boiling water as it boils away. Puddings can be made months before use and stored in a cool, dry place; to re-heat them let them stand in boiling water for 2 hours or more.



Christmas pudding turned out ready to serve and decorated with powdered sugar and a sprig of holly.

The following is a recipe for a good rich pudding. Mix well together 4 oz. Flour, ¾ lb. breadcrumbs, a small teaspoonful salt, ½ Ib. chopped beef suet, and a flat teaspoonful allspice. Stone ½ Ib. raisins, or use ½ Ib. of seeded; wash and pick over carefully ¾ Ib. each of currants and sultanas, and stir them into the flour, etc. Add 3 oz. each of candied orange and lemon peel and 1 oz. citron, cut into thin strips, 2 oz. roughly chopped sweet almonds, and, if desired, 2 oz. glacé cherries. Mix in also ¾ lb. moist sugar, and the grated rind and juice of ½ a lemon. Beat up 3 eggs, and mix with them 2 ½ tablespoonfuls rum, 1 tablespoonful brandy, and 4 tablespoonfuls ale or stout. Pour this liquid on to the other ingredients, and the more thoroughly it is stirred the better. Leave it for about an hour, and it is then ready to be put in the basin and boiled. This will make a pudding which will be large enough for 10-12 persons.

For a plainer pudding, chop ½ Ib. of beef suet very finely. Clean and pick over ½ lb. each of currants and sultanas, and stone and chop roughly ½ Ib. raisins. Mix them in a large basin with ½ lb. moist sugar, ¼ Ib. flour, ½ Ib. breadcrumbs, a little salt, and a saltspoonful of allspice. Peel and core ¼ Ib. apples and chop them finely, or put them through the mincer. Blanch-and shred 1½ oz. sweet almonds, and cut 2 oz. mixed peel into thin strips. Add these to the other ingredients, with the grated rind and juice of ½ an orange and ½ a lemon, and mix well in. Beat up 3 eggs, strain them on to the other ingredients, and mix. Add ¼ pt. of stout, and enough milk to make the mixture drop from the spoon. Let it stand for an hour, then put into basins, tie down, and boil. If made into one pudding, this will be enough for 10-12 persons.

To serve a Christmas pudding, turn it out on a very hot dish and pour over it brandy sauce, or hand round brandy butter separately. Alternatively, pour a little

brandy over the pudding just before bringing it to table, and set it alight. Decorate it, with a sprig of holly. Ready-made puddings are sold by most grocers and provision dealers, and all they require is a few hours' immersion in hot water. *See* Brandy Butter; Brandy Sauce.

CHRISTMAS ROSE. Helleborus niger, commonly called Christmas rose, is a member of the buttercup family. It is a hardy perennial which thrives in partial shade in deep sandy loamy soil. When transplanting becomes necessary it should be done in July; the clumps ought to be broken into several moderate-sized pieces. The finest variety is named altifolius (maximus). The blooms are protected by covering them with a handlight.



Christmas Rose. Cluster of flowers and leaves of Helleborus niger.

CHRYSANTHEMUMS AND THEIR CULTURE
The Characteristics of Many Different Varieties

In addition to the entries on Aster and other favourite flowers, consult general appropriate articles as Borders; Greenhouse, etc.; also gardening notes under headings of the various months, e.g. April

Few flowers equal the chrysanthemum in popularity, for even in small gardens beautiful displays of hloom can be obtained with very little trouble during the months of September, October and November. It will nourish in beds and borders, but still more under glass, where the flowering period is prolonged into winter, so that it is practically the last of the great plants to bloom. No plant better withstands impurities in the air, and consequently the chrysanthemum is successfully cultivated in town gardens.

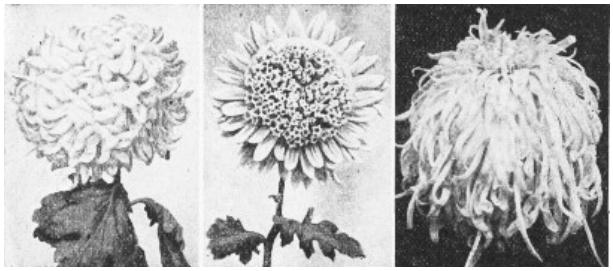
There are many types of chrysanthemum; some of them are suitable for cultivation out of doors, others in pots under glass. Among them are several hardy border perennials, e.g. the shasta daisy or hardy marguerite (varieties of chrysanthemums maximum and leucanthemum) which bear large white blooms on long stems in summer, and the moon daisy (chrysanthemum uliginosum), a tall plant with Chrysanthemum greenish-white flowers in September. Japanese, incurved, decorative and single-flowered chrysanthemums are grown in pots to supply blooms under glass in autumn and winter. Early or border chrysanthemums flower out of doors from August to October. Annual chrysanthemums, of which seeds are sown out of doors in March, flower in summer.

The border chrysanthemum is hardy in all except cold districts, is easily managed and blooms profusely in late summer and autumn. It is a flower for every garden. Present-day varieties are innumerable, and every year fresh ones are introduced; they bear double or single blooms in crimson, rose, yellow, pink, orange, bronze, and many other shades of colour.

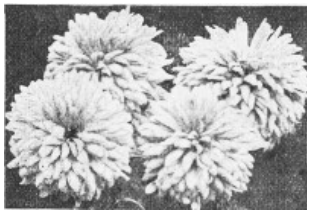


Chrysanthemum. Single variety.

A start should be made by purchasing small plants in May and setting them out at 18 in. apart in a sunny place. Ordinary soil which has been well dug suits them; some decayed stable manure and a scattering of bonemeal should be mixed in. In a fortnight's time the top of each plant should be pinched off to make it branch out; the fresh shoots may be stopped early in June, but not after that month or the blossoming season will be too late. This treatment will ensure the development of well-branched plants that will bloom freely in early autumn. During the summer months the soil between the plants should be hoed frequently, and it will be necessary to stake the plants securely in order to prevent the shoots being broken or becoming misshapen.



Left to right: Japanese "Mrs. George Monro"; anemone-flowered "Aphrodite"; another Japanese variety.



Chrysanthemum. Double variety of border plant.

Although most of the plants will pass through an ordinary winter safely, especially if covered with old ashes, it is wise to lift a few of them, cut down the stems, and set them in boxes of soil in a cold frame; in early spring fresh shoots will grow, and these are used as cuttings to increase the stock. They should be severed slightly below the soil surface, trimmed just beneath a joint, and inserted in pots or boxes of sandy soil in the frame. If the latter is kept closed and the soil moistened occasionally the cuttings will form roots in 3 or 4 weeks. They will be ready to plant out of doors in May.

Border chrysanthemums may be left out of doors undisturbed for two or even three years if large plants bearing an abundance of bloom are wanted.

The following are some of the best varieties, flowering in August-September:

Afterglow, terra-cotta; Charlotte Harley, crimson; Cranford, yellow; Crimson Circle, red; Gold Dame, yellow; Guinea Gold, yellow; Mme. Desgranges, white; Miss Mattie, yellow; Mrs. Thorpe, terra-cotta buff;

Mrs. J. Pearson, bronze; Phoenix, red; Shirley Bronze, bronze yellow; A. McAlpine, bronze yellow; Harvest Moon, yellow; Red King, reddish.

Flowering in September:

Almirante, chestnut crimson; Crimson Marie Masse, Early Buttercup, yellow; Fee Parisienne, rose mauve; Goacher's Crimson, Golden Goacher, yellow; Horace Martin, yellow; J. McAlpine, rose pink; Leslie, yellow; Mme. M. Masse, lilac-mauve; Normandie, pink; Pink Delight, Polly, orange yellow; R.A. Roots, white; September White.

Flowering in October:

Bébé Blanc, white; Betty Spark, rose pink; Champagne, red; Cranford Yellow, Dragon, bronze; Ethel Harvey, yellow; La Garonne, reddish salmon; Pink Spray, pink.

Single - flowered chrysanthemums which bloom out of doors in early autumn are:

Delice, pink; Doreen Woolman, yellowish: Early Mary Richardson, buff; Maidenhood, primrose; Red Riding Hood, red; Shirley crimson; Snowstorm, white; Vicar of Shirley, bronze.

Raising Specimen Blooms. For the culture of large blooms the plants, grown in pots under glass, should be cut down immediately the flowers have faded, and the shoots growing through the soil will form the cuttings for new stock. Place the cuttings round the edges of pots containing a mixture of sandy loam, first dropping a pinch of silver sand into each hole. Put them under a handlight or propagator in a greenhouse temperature of 50° F.

Well-known growers who specialise in the chrysanthemum may be relied upon to supply excellent young plants in the spring. They must be given plenty of air, and they must not be grown in a temperature higher than 50°. Their proper place is in an airy house close to the light. A 3-in. pot may be used, and the compost should consist of four parts loam, two parts leaf-mould or well-rotted manure, and one part silver sand.

It is a good plan to make the potting soil fairly moist, and it is then unnecessary to water the plants for a day or two. By the beginning of April the plants will be well rooted, and should be put into 6-in. pots, the compost being rougher and a trifle heavier. The newly potted plants should be put back in the frame and kept fairly close for a day or two until the roots have begun to push out into the new material; but the pots must not be crowded. When the plants are again growing well give them a sheltered position in the garden, and do not allow to become dry.

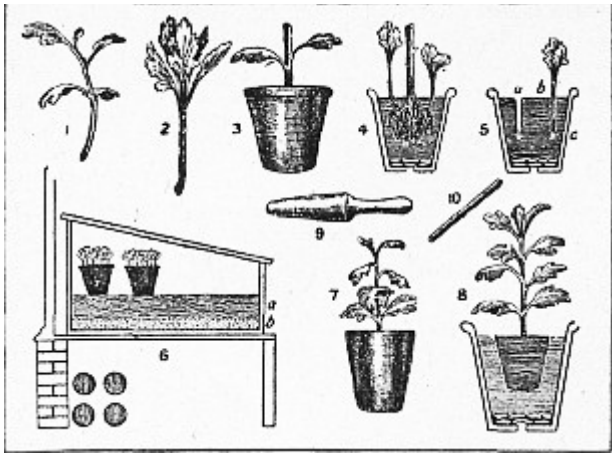
The final potting, which is done in June, is a detail of importance. Flower-pots, 9 in. wide, are suitable for most varieties. The compost should consist of pieces of loam (old turf) two-thirds, well decayed manure one-third with a scattering of sand and crushed brick, and a sprinkling of superphosphate of lime or special chrysanthemum fertiliser. The compost must be made firm with a wooden rammer and a space of about 1 in. left at the top when potting is finished. The best position for the plants is on a sunny gravel walk. Each plant must be staked.

Different varieties need different treatment in respect of stopping and taking the buds. Often the chrysanthemum produces a flower bud in May: this, which is known as the break bud, perishes and fresh shoots which will form the branches grow from beneath it. If this break bud does not form, the top of the plant must be pinched off to cause the development of other shoots. Usually not more than two or three of these are allowed to grow.

In August each one will bear a flower bud which is called the first crown. If the variety produces its best blooms from first crown buds, these are "taken" by removing the small shoots that grow beneath them.

If, however, the variety yields its best blooms from second crown buds, one of the small shoots beneath each first crown bud is allowed to grow; the bud itself will perish. Each of the new shoots will, in due course, produce a flower-bud—the second crown.

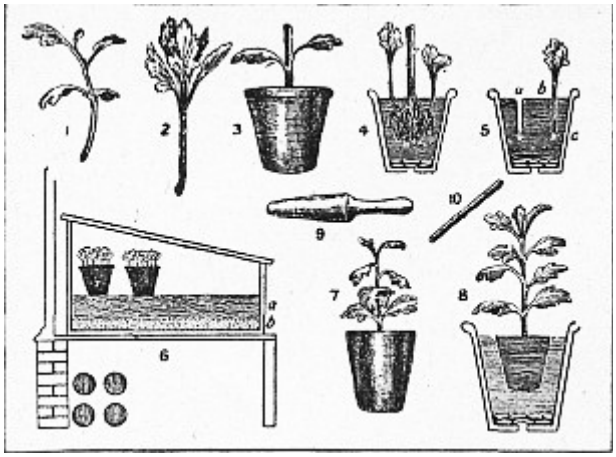
Amateurs will get the best results from most varieties by stopping the plants in April or May, and taking the first crown buds in August. If the shoots beneath the second crown buds are allowed to grow they will subsequently bear buds which are called terminals because they terminate the season's growth. Amateurs who grow for large blooms should consult the chrysanthemum catalogues which give the correct bud to take for each variety.



Chrysanthemum. Diagrams illustrating the method of raising from cuttings. 1. Poor, and 2, good cuttings. 3 and 4. Plant cut down, cuttings starting to grow. 5. Inserting a cutting; a. hole made by dibber; b, cutting inserted with sand at c. 6. Section of cold frame with cuttings in pots standing on a, sawdust or fibre; b, sifted cinders. 7. Booted cutting in small pot. 8. Later potting.9. Rammer used in potting. 10. Dibber.
(By special arrangement with "Amateur Gardening")

When the buds are developing the plants must be fed once a week alternately with weak soot water and with one of the special chrysanthemum fertilisers used according to the directions supplied. Towards the end of September the plants are placed under glass where

the blooms will open from November onwards. The glass house must be ventilated very freely in mild weather.



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(By special arrangement with "Amateur Gardening")

The Japanese varieties are grown to provide the largest blooms: not more than from one to three are left on each plant. The following are first-rate varieties:

Dawn of Day, reddish yellow; Duchess of York, rose-purple; Helena Margerison, pink; Lady Talbot, primrose; Louisa Pockett, white; Majestic, amber yellow; Marjorie Woolman, reddish bronze; Edith Cavell, bronze yellow; Mrs. B. Carpenter, rose; Mrs. R. C. Pulling, yellow; Peace, yellow; Princess Mary, yellow; Queen Mary, white; T. W. Pockett, silvery pink, very large; Viscount Chinda, yellow; W. Turner, white; W. Rigby, yellow.

Many new varieties are introduced each year.

Incurved varieties which need similar treatment to the Japanese are now little grown except for exhibition. A few of the best are:

Buttercup, yellow; C. H. Curtis, yellow; Lady Isabel, blush; Ondine, white tinged with green; W. Pascoe lilac pink.

Decorative chrysanthemums are splendid flowers for amateurs: they are double and of medium size. One plant will produce six or more blooms. The plants should be stopped in April or in June, the first crown buds being "taken." They can be planted out of doors for the summer and carefully lifted and repotted in September, though they do better if grown in pots throughout the season. They bloom under glass in late autumn. A few attractive varieties are:

Aldyth, crimson; Baldcock's Crimson: Blanche Poitevine, white; Cissbury Pink; December Gold, yellow; Dr. Enguehard, rose pink; Exmouth Crimson, H. W. Thorpe, white; Jean Pattison, copper salmon; Mme. E. Roger, greenish; Mrs. R. F. Felton, crimson; R. H. Pearson, yellow; Wellington Wack, primrose.

These varieties can be grown to form large specimen plants, each bearing from 40 blooms upwards. Cuttings should be taken as early as possible in November or December. By stopping the shoots frequently well-branched plants are obtained. Stopping should not be done after June. The shoots must be staked and tied with great care. The final potting is done in June.

There are some beautiful single-flowered varieties which bloom under glass in late autumn; they need the same treatment as the decoratives. A few of the best are enumerated below:

Ceddie Mason, crimson; Exmouth Pink; Fusilier, bright crimson; Godfrey's Triumph, yellow; Mary Richardson, terra cotta; Phyllis Cooper, yellow; Sandown Radiance, chestnut crimson.

Other types of chrysanthemum are the pompon, anemone-flowered, and thread-petalled. The latest novelty is the cascade chrysanthemum, which is of somewhat drooping growth, bears small single flowers and makes a most decorative pot plant.

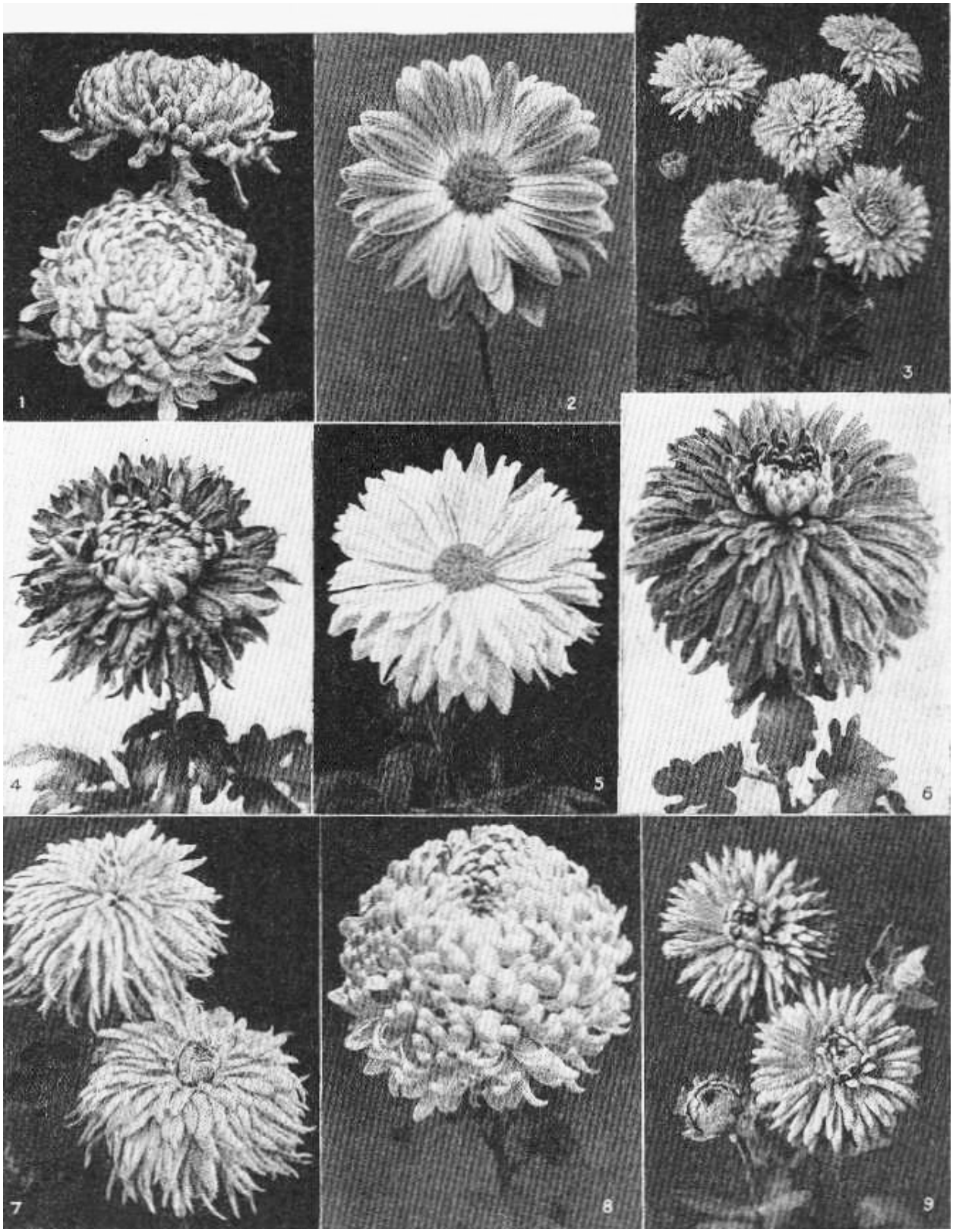
Aphis or fly attacks chrysanthemums, but can be destroyed by using one of the numerous proprietary insecticides. Earwigs may damage the buds; they should be trapped in small flowerpots filled with hay and placed, inverted, on the chrysanthemum sticks; the traps must be shaken over hot water every morning.

Rust and mildew are plant diseases which may damage chrysanthemums. On the first sign of infection the plants should be sprayed with liver of sulphur, 1 oz. in 2 gallons of water. The leaf mining maggot often disfigures the leaves by boring. Maggots can be destroyed by pinching the affected parts of the leaf between the finger and thumb. *(See also pages 452 & 453)*

CHUBB: The Fish. Casserole cooking is the best way with this freshwater fish, which somewhat resembles a carp. The fish should be washed in vinegar and water and then sliced; 2 or 3 small onions are sliced and fried in butter, and 1 pint fish stock added, with a dessertspoonful of mixed herbs and seasoning. The fish is allowed to simmer in this for ½ hour, then lifted out, and kept hot. Add 1 oz. flour mixed with melted butter to the liquid, and continue simmering until the sauce has thickened. The fish is served in the casserole and garnished with little sippets of toast.

CHUCK: Its Uses. In its simplest form this is a body piece adapted to screw on to the spindle of a lathe, or mandrel nose, as it is termed. Projecting from the end of the body is a tapered and coarse-threaded screw, on to which is screwed the piece of wood to be turned; such a tool is known as a screw chuck (Fig 1). When the work is long, like a baluster rail, and is supported at the other end by the tailstock, a prong chuck (Fig. 2) is the proper tool to

(Continued in page 454)



The varieties shown on this page are: 1. Bronze Early Buttercup. 2. Chrysanthemum Absolute. 3. Dawn. 4. Biterra. 5. Caroline. 6. Salamander. 7. Sylvia Superb. 8. Pink Topaz. 9. Golden Beam.

(Photographs, Nos. 1, 2 and 5. Reginald A. Malby; Nos. 3,4, and 9, courtesy C.W. Teager; Nos. 6, 7, and 8, courtesy W. Abbing)



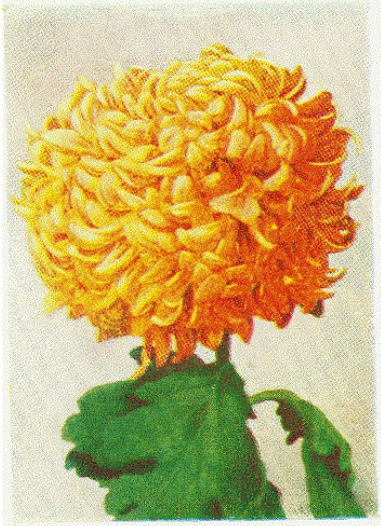
Single-flowered "Phyllis Cooper"



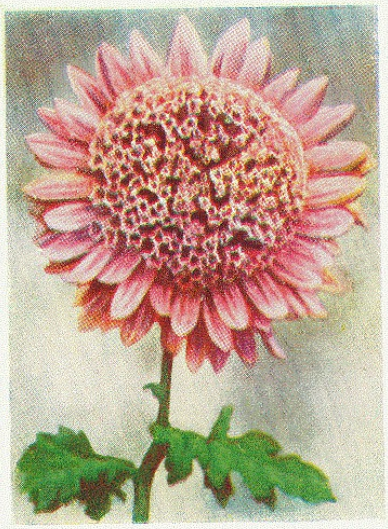
Group of " Mary Masse," for growing in borders



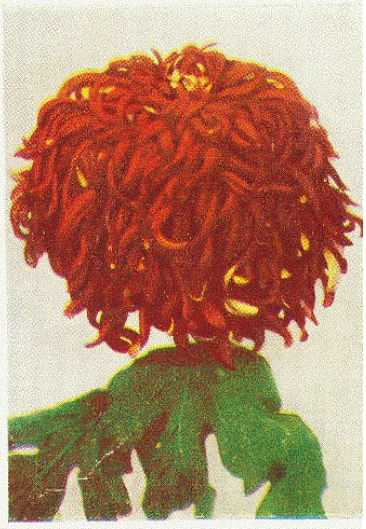
Decorative "Uxbridge Pink"



Japanese "Mrs. George Monro"



Anemone-flowered "Aphrodite"



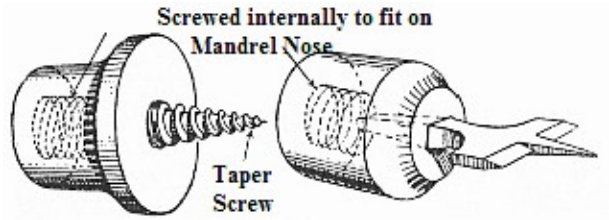
Japanese " Majestic"

CHRYSANTHEMUM: FOR THE GARDEN OR THE CONSERVATORY

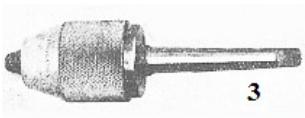
Some beautiful varieties of this most satisfactory flower. General directions for their culture are given in p. 451.

use.

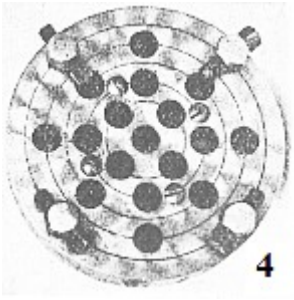
A drill chuck has movable jaws actuated by a screwed part of the body, a usual and cheap pattern like that illustrated in Fig. 3 being commonly found on hand drills, braces, and small drilling machines.

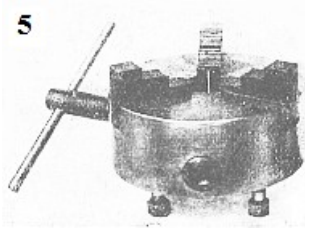


Chuck. Figs. 1-2. Showing construction of taper screw and prong chuck.



Chuck. Fig. 3. Goodell drill chuck. Fig. 4. Odd jobs chuck with four dogs in place. Fig, 5. Self-centring key scroll. (Courtesy of R. Melhuish & Co., Ltd.)





useful and inexpensive variety of chuck, known as a dog chuck, is shown in Fig. 4. The work is held by the short set screws; the posts, or dogs, in which they turn can be inserted in any of the holes in the body or faceplate. Such a chuck can be used on a simple lathe, and will also be found of service for holding work under a drilling machine, or while otherwise working upon it.

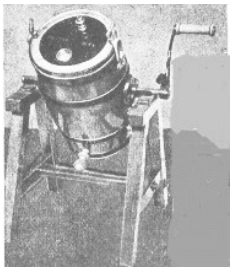
A popular chuck for amateur use is a three jaw self-centring scroll chuck (Fig. 9). This tool automatically centres the work. Two sets of jaws enable a wide range of internal or external work to be held very securely.

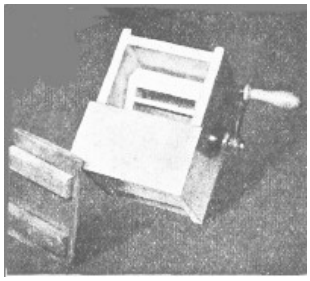
Chucks should always be kept clean and free from chips, especially the working parts, which may be lubricated from time to time with light machine oil. It is always necessary to clean the screw threads before screwing the chuck on to the mandrel nose, as any chips or dirt in the threads will make it jam or run out of truth. *See* Centre; Lathe; Mandrel; Metal Turning; Wood Turning.

CHURN: For Making Butter. One of the simplest churns consists of a glass jar or vessel with a nickel-plated screw cap, and a wooden beater actuated by means of bevel gears and a crank handle. It is readily cleaned and requires little attention beyond occasional oiling of the gears and spindle.

The barrel type of churn consists of a solid hardwood frame provided with roller or other bearings, on which is supported a steel shaft, rotated by a crank handle. A hardwood barrel with a remov-able lid at one end is attached to the shaft, and is rotated end-over-end when the crank handle is turned. The method of fitting and securing the lid is of im-portance in this class of churn. In some, a number of screw clamps are used to press the lid home; in another, a cam actuation is used to hold the lid in posi-tion. Some barrel churns are supplied without a dash or beater; others have various forms of patent devices, such as the diaphragm.

Churns should be kept in a condition of scrupulous cleanliness, and preferably in a cool and equable temperature. There is virtually nothing to go wrong or to require special attention in a good churn. *See* Butter.





Left. Churn.End-over-end diaphragm churn. Right. Wooden box churn, with cover removed in order to show the dash or beater. (Courtesy of Thomas Bradford & Co., Ltd.)

CHUTNEY: The Condiment. Taken as a relish with hot or cold meat dishes, chutney is an Indian condiment, of which there are many varieties, such as Bombay, Madras, and mango chutneys. The ingredients include raisins or mangoes, cayenne pepper, ginger, spices, and lemon. Several kinds of chutney can be made at home with apples, tomatoes, marrows, etc., recipes for these being given under their separate headings.

Cicatrix. *See* Scar.

CIDER: How to Make. The apples should be gathered in dry weather, of as even a degree of ripeness as possible, but just before they are quite ripe. Decayed, damaged, or worm-eaten apples must be removed and the stalks picked off. Keep the apples about 14 days in a dry, well-ventilated place, and make the cider in cool weather. The making is done in three processes, the apples are crushed to a pulp or pomace, the juice squeezed out, and finally fermented.

For crushing, take a very strong, iron-hooped tub, about 18 in. in diameter, put in enough apples to cover the bottom, and pulp them by means of a heavy hardwood bruiser, not unlike that used by a street pavior. Pound a few apples at a time, and see that the bottom of the tub is well supported on the ground so as not to risk splitting it. The pulp should be continually removed from the tub as crushing proceeds.

For pressing, a strong haircloth or coarse canvas sheet—a cloth called netting shading is the best—3 to 4 ft. square is used. The pulp is spread evenly over about 18 in. square in the middle, and when about 3 in. deep the sides of the cloth are folded over the pulp; then

another cloth is placed on top of this and more pulp packed in that. In this way, a cheese, as it is called, is built up, the number of canvas sheets depending on the size of the press.

The simplest form of press consists of two hinged boards, the pressing leverage on top being obtained by using a stout pole; this is a crude way of pressing, but has been used by cottagers. Wooden presses are made very like those used for copying letters; so long as the bare iron does not come in contact with the apple juice, the latter might serve as presses for a small cheese. The press has to stand in a tray or tub to catch the juice, and from this tray or tub the juice is run into a cask.

If one man pounds the apples while another does the pressing they can between them make 10 to 11 gallons a day, and this amount will take about 180 lb. of apples, or less with a good press. It is not absolutely essential that the pulp should be pressed the same day as it is made; some keep it 24 hours, as it is said to improve the yield; but there is danger of vinegar acid forming by too long exposure to the air and, in any case, the extra yield is doubtful.

As a rule apple juice is left to itself to ferment, the yeasts present on the skin at crushing being sufficient, as in the case of the grape; but in small fermentations it is usual to start the fermentation with a little brewers' yeast. This is advisable, because it can never be foretold how long apple juice will take to ferment; sometimes fermentation is complete in 10 days, sometimes not under six weeks.

Having collected, say, 10 gallons in a cask, mix 2 oz. fresh brewers' yeast with 2 oz. honey and 1 oz. flour, place it in a muslin bag, and suspend the bag in the cask by a piece of string. The cask must be supported on a stand so that a tub can be placed underneath to collect the yeasty froth which works out of the bunghole, and the cask must be topped-up occasionally to keep it full and allow the scum to overflow.

As fermentation ceases and the cider shows signs of clearing, it is run slowly and carefully into a clean cask, which is then bunged down and kept in a cellar at a temperature between 50° and 60° F. If the fermentation is very tumultuous, or if the cider is required sweet, the transferring to another cask (called racking) should take place earlier and be repeated two or three times, avoiding aeration as much as possible. This tends to stop fermentation and prevent the cider getting too thin. The rate of fermentation should be watched by using a saccharometer and the casks should be treated with a sulphur match after cleaning. *See* Apple.

Cider Cup. To make cider cup, slice 2 in. of cucumber very thinly, and put the pieces in a jug, together with 1 oz. castor sugar and a sprig of mint, pouring over them half wineglassful of sherry and a quart of cider. Then add 2 bottles of soda-water. Cover the jug, place it in ice or in a very cold place, and leave it for about 2 hours. Then strain out the mint and cucumber, and the beverage is ready for use.

CIGAR: Choice and Varieties. It is not possible to judge a cigar by the outside. The outside wrapper is very often made of fine leaf, and the inside filler of cheap leaf, or of scraps of leaf and stalk rolled up together. The only way to judge the filler of the cigar before smoking it is to cut through the cigar lengthwise. But if the cigar comes from a factory with a famous name, one can assume that the inside is of the same quality as the outside. Then the point to look for is an oiliness or glisteningness of the wrapper. Spots on the leaf are caused either by sunburn, or insect-bites on the leaf. They suggest by appearance that the cigar is not first rate; but, actually, they do not affect its smoking qualities at all.

If you place a cigar to your ear and crackle it, all that it tells you is whether the cigar is very dry or not, and the crackling may split the leaf! Some people prefer their cigars very dry, but the majority like them of medium, dryness. The smell of a cigar is a partial indication of its smoking quality; but a cigar which smells good does not necessarily smoke good.

As to the ash, if this remains firm for a long time while the cigar is being smoked, it means that the filler is composed of long leaves, neatly arranged and rolled. It indicates care in manufacture, but is not a guarantee of well-matured leaf. When the ash of a cigar is flicked off, the point should be sharp and bright, not ragged and dull. A sharp and bright point indicates a well-matured leaf.

Keeping Cigars. The proper keeping of cigars is important. Choice tobacco leaf is extremely sensitive to atmosphere, and to odours in the atmosphere, and will readily absorb them and affect its own taste. Paint, for instance, and especially wet paint, will ruin any cigar or tobacco placed near it. Salt sea-air will completely spoil a fine cigar. Therefore cigars must be kept in airtight boxes. Cedar-wood is the best material for the box.

If cigars are subjected to sudden heat they throw off their natural moisture and essential oils which give the character and bouquet to the cigar. In appearance the cigar is not changed; but in smoking quality it has become very different. That is why cigars have to be kept at a fairly even, medium, and dry temperature, in order to retain their condition. The best temperature is between 60° and 65° Fahrenheit. A fine cigar should be carefully lighted—lighted all round, so that it will burn evenly and not raggedly. When cigars burn down one side first it is usually due to careless lighting.

The shape of a cigar is a matter of individual fancy. Many people prefer the torpedo shape as a matter of appearance, or of comfort in holding the cigar between the lips; but in the shaping of such a cigar much good leaf has to cut away to waste, and this makes the cigar expensive in proportion to the amount of leaf it contains. A straight shape avoids this waste of cutting, and many of the finest Havanas are made in that form.

CIGAR CASE. The cases which are made to hold a few cigars for carrying in the pocket are usually either

of leather or of metal, the former being lighter and, generally speaking, more serviceable, while in a metal case the cigars are more effectually protected from getting crushed or broken. Some leather cases have the edges reinforced with metal, and others are padded to make them stiffer and less flexible. The most useful type in leather is made in two portions, one part containing the cigars, the other sliding down over the first, and so making the case practically airtight. Since this case does not require to be folded, the leather used can be much stronger, and a double thickness on either side lessens the risk of crushing and overheating the cigars.

A metal case affords complete protection, besides being airtight. The chief disadvantages are the size and weight. The lightest type is fitted with grooves to take three or four cigars. The hollowing out of the grooves makes for lightness, keeps the cigars separate, and so prevents the outer leaf from being damaged. A very small case is made to take a single cigar. Aluminium is of little use for a cigar case, as it is a good heat conductor, and may spoil the aroma of the cigars in a very short time. The ideal case is of silver, a metal which is lighter and harder than gold.

CIGARETTE. The main varieties of cigarette are Virginian, made from blendings of leaf from Virginia and Carolina; Turkish and Egyptian, manufactured from leaf grown in Asia Minor and Greece; and Havana, made from the cuttings of Cuban leaf used in the rolling of Havana cigars. Cigarettes are also made from Rhodesian tobacco. Mixtures of Virginian and Turkish are also sold, generally under the title of Turkish blend or Egyptian blend. Turkish leaf is considerably more expensive than leaf from Virginia and Carolina.

Cigarettes, like any other form of tobacco, are easily affected and spoilt by strong odours around them. They should be kept in condition in an airtight box, preferably of cedar-wood. The best cigarettes are rolled in very fine and pure rice paper, as thin as possible, so that no taste of burning paper shall spoil the taste of the tobacco smoke. Cheap cigarettes are rolled in inferior paper, to which saltpetre or other chemical is sometimes added to make it burn quickly. Many people prefer a cork tip, for the reason that it prevents fragments of leaf from entering the mouth.

Some smokers prefer to make their cigarettes, and this is quite simply and easily done by hand. All the outfit required is some light Virginia tobacco, which is mostly used, and a small packet of rice-paper, which is sold either with or without a gummed edge, some smokers preferring to dispense with the gum.

Cigarette Holder. The variety usually offered in cigarette holders is very wide, for they are manufactured not only in gold, silver, meerschaum, amber, and ivory, but more extensively in vulcanite, horn and bone, imitation amber and other compositions, or simply of wood.

Among the more expensive sorts is the plain tube of real amber of varying length, with gold rim, and the silver-mounted meerschaum with amber mouthpiece. Ivory, tortoiseshell, and mother-of-pearl holders usually have gold mounts.

Plain holders are made of horn or bone in great variety as well as in polished wood, and the cheapest of all are of cardboard with a quill mouthpiece. Imitation meerschaum and amberette offer another variety, and compositions figure largely in the manufacture of many others, particularly the tube or trumpet-shaped kinds, which are produced in many colours. The length varies from 2 in. to 6 in., or even longer, the average being about 3 in. to 4½ in. *See* Tobacco.

CIGARETTE CASE. The metals employed in making cigarette cases include gun-metal, as well as gold, silver, and platinum. The outer surface may be plain, but is more often engraved. Silver is largely used, and many beautiful cases are made from tortoise-shell. Cheaper varieties are of nickel, white metal, or papier mache, frequently decorated with enamel pictures. Most cases are flat, but some, especially those made of silver, are slightly elliptical.

Cigarette cases are also made of leather, and many smokers prefer this medium, as a larger number of cigarettes can be carried in a flexible leather case than in the rigid metal one. This also allows of several kinds of cigarettes being packed into one case.

CINCHONA BARK. Quinine is found in the bark of the cinchona tree, which grows in S. America and elsewhere. The official dose of cinchona bark is 3 to 15 grains, and more in malaria cases. The powder form may disagree with the stomach. Common preparations are given in the following doses:

Liquid extract	5-15 minims
Tincture	½-1 dram
Compound tincture	½-1 dram

The action of cinchona is practically that of quinine. The liquid extract of red bark is recommended for inspiring in dipsomaniacs a distaste for alcohol. *See* Quinine.

CINDERS. The cinders from a coal fire need never be thrown away. First of all they should be sifted through a fine sieve. The fine dust that passes through can be dug into the garden soil, while the coarser cinders should be used again mixed with coal. If the fire is merely to be kept in till needed, a shovelful of cinders will keep it going. Pine cinders make effective garden paths; they lighten a heavy soil and make excellent drainage material in garden pots, and for the garden generally. Mixed with cement, a good concrete results.

In country districts where no proper drainage exists, it is useful to filter waste waters, such as those from the kitchen sink through cinders contained in an old perforated pail. The solid materials, such as grease, are

the cinders should be burnt and the pail replenished. *See* Ashes; Path.

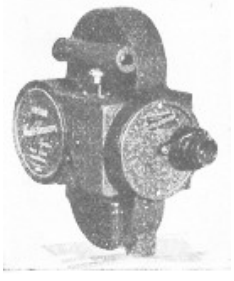
CINDER SIFTER. The cinder sieve usually measures 12 in. to 15 in. in diameter, and is made with japanned metal or wooden rim and blacked iron wire bottom of fairly close mesh. A heavier make of about 18 in. to 20 in. diameter has an oak rim 4 in. to 5 in. deep and a straight mesh. In a superior make the strands are separately soldered to the cross supports. Apart from their use for cinders, such sieves are serviceable in the garden for sifting mould, earth and gravel.

CINEMATOGRAPHY IN THE HOME
A Modern Popular Hobby and How to Practise It

Other articles dealing with domestic amusements, both indoor and outdoor, include Billiards; Bowls; Conjuring; Croquet. See also Camera; Colour Photography; Gramophone

The making and showing of motion pictures for home and general amateur use has now taken its place as a popular hobby, practised by many thousands of people throughout the world. A most complete range of apparatus and accessories is available for the amateur who wishes to take his cinematography "seriously"; yet for the non-technical man the matter may be simplified, more or less, to "button-pressing."

Standard cinema film of 35 mm. width, as used for the professional cinema, has been entirely superseded in the amateur world by "sub-standard" films, of which there are three recognised gauges, or widths: 16mm., 9.5mm., and 8mm. To arrive at a fair comparison between the cost of filming with these three gauges it is necessary to consider the total cost (including processing) of a finished film lasting for a certain time on the screen, and on this basis the average cost for a four-minute film is: 26s. for 16mm. film, 16s. for 9.5mm. film, and 10s. for 8mm. film. This compares with £5 or £6 for standard film.



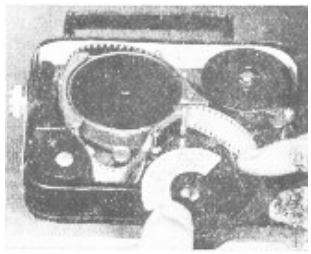
Cinematography. Fig. 1. The "Autokinecam," which can be used at three different speeds

Four minutes is a much longer period of time than it may seem, and it is a fact that about 30 different scenes can be adequately dealt with in a film of this length.

All modern sub-standard cine cameras are motor-driven; the majority by clockwork motor, but a few by a small battery-operated electric motor. It is only necessary to load the camera with film, wind up the motor (if a spring motor), adjust the lens stop to give the required exposure, sight the subject in the view-finder, press the release button—and the film is being taken.

The film is supplied for daylight loading in all gauges; either on a light-proof spool or in a magazine (according to the type of camera for which it is required), and in most cases the price includes free processing after exposure. Therefore, when the film has been exposed it is merely returned to the processors, who convert it into a positive ready for showing in the projector, and post it back mounted on a projection reel.





Cinematography. Fig. 2, left: a Cine Kodak 16mm. camera with view-finder, direct-vision finder, and two-speed clockwork motor. Fig. 3, right: double-run 8mm, film being loaded into camera. Note simplicity of mechanism.

Provided the exposure has been reasonably accurate the quality of screen picture derived from these small films —even the 8mm. film—is quite remarkable and compares creditably with the professional film of the public cinema.

The type of film which includes processing in, the price charged is known as reversal, or reversible film because, after exposure, the film is chemically "reversed" to give a positive instead of a negative image. Some brands of reversal film may be purchased without processing rights, but successful reversal processing is not a matter for inexperienced hands.

Separate negative and positive films are also available in the sub-standard sizes, but are not much used by the ordinary amateur, Who usually requires only one copy of each film and achieves better results on reversal than on positive printed from negative film. The chief advantages of "negative-positive " are that editing and titling can be effected on the negative from which a continuous positive, free of joins, can be printed; and also that any number of positive copies can be printed at any time from the negative, which is never subjected to wear in the projector. On the other hand, reversal films may also be duplicated provided the original has not suffered through use.

Most makers of cine cameras provide a choice of either fixed focus or focussing models: the former are more simple because the lens is permanently focussed to give sharp pictures of any subject beyond about 8 feet from the camera; for closer subjects a simple supplementary lens is slipped on to the camera lens. Focussing cameras enable subjects as close as 18 inches or 2 feet to be taken, without supplementary lenses, but the cameraman must always remember to adjust the lens for whatever distance is required. On the other hand, focussing cameras are usually provided with a "faster" lens, which means that filming may be undertaken in light which would be too poor for the

slower lenses.

The normal rate of film travel is 16 pictures (or "frames") per second, but some cameras are provided with a range of different speeds to allow for trick work or special effects.

How to Use the Cine Camera

When the cine camera has been loaded with film and the clockwork motor wound, there is —assuming the use of a fixed focus camera— only one adjustment to be made by the cameraman before commencing to film, and that is to set the diaphragm, or lens stop, to give the correct exposure. When the light is poor the diaphragm must be opened wide; when it is brighter the diaphragm must be closed, more or less, according to the brightness of the subject.

Owing to the special system of compensated processing adopted by the leading makers of film a fair latitude exists for errors of exposure, but it is always to be understood that the best results can only be obtained by reasonable accuracy in exposure. Tables, calculators and meters of many kinds are available to assist the cinephotographer in exposing correctly, and the most satisfactory aid is the photo-electric exposure meter, of which there are many different makes.

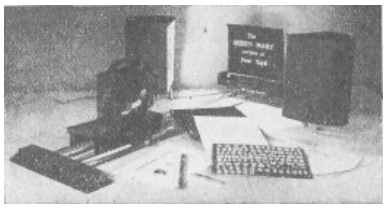
The first efforts of the beginnner at cine-photography invariably betray three outstanding faults: The camera is moved about, either to embrace a panoramic view or to keep some moving object within the view-finder; the "shots" are a succession of what are called "Long Shots" (i.e. general views and full-length subjects); and individual shots are held for too long.

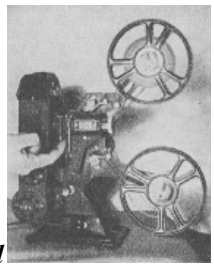
Variety and movement (of the subject) are the soul of cinematography, and three or four short shots showing different angles or phases of an action are much better than one all-embracing shot which lays no emphasis on the interesting details of the action. It is all a question of camera position in relation to the subject.

A successful method of treatment is to take first a short general view of the subject and then to move the camera closer, ferreting out the interesting details to be shown "in close-up." Although the camera position should be repeatedly changed in order to maintain interest in the picture it should be kept perfectly still during the actual taking of each shot, and not swung round or to and fro; this is most important.

The most successful films are those in which a certain amount of planning has been done beforehand. If each shot is simply left to the inspiration of the moment it is almost impossible to achieve—what should be the aim of the simplest film, even Baby on the Lawn—a connected story. Distant scenes are generally disappointing; mid-shots and close-ups are the most interesting.

Editing and Titling. All films are vastly improved by being edited and titled. Simple editing involves the cutting out of all badly photographed sections, identification numbers, and "dead ends" (e.g., surplus frames at the beginning and end of each shot, where no action is taking place) and, perhaps, joining several spools together to form a 300- or 400-ft. length. A splicer and film cement are indispensable to every amateur cinematographer.





Cinematography. Figs. 1 and 2. Above: The Cinecraft "Universal Senior" Titling Outfit. The letters can be obtained in cardboard, felt, celluloid and magnetic metal. Right: a popular "baby model" projector (Pathescope 200-B., 9.5mm.,) designed for use on all D.C and A.C. mains. The lamp-house is fan-cooled.

Titling is an interesting part of the hobby, and a great variety of titling outfits is available to the amateur. The title is either drawn, stencilled or printed on card or paper, or movable letters may be purchased which cling to a suitable background. A titling stand enables the camera and title to be correctly set up so that the title is photographed, by artificial light, to form the necessary title strips of film, which are afterwards inserted in the appropriate places.

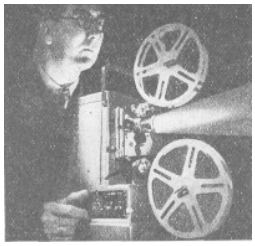
Cine Work in Colour. Cinephotography in natural colours is available in all substandard gauges, Kodachrome natural colour film being obtainable in 16mm. and 8mm. size, while Dufaycolor film is made in 16mm. and 9.5mm. gauge. No special filters or accessories are needed for these colour films, which are used exactly the same as black-and-white reversal films (except that a wider aperture or lens stop may be necessary).

Filming in the home by artificial light is easily possible with the fast films and reasonably priced Photoflood lamps now available, and even indoor colour films may be made by means of the Photoflood, Type "N," lamp. Special Kodachrome film is supplied for artificial light, while Dufaycolor needs merely the addition of a filter on the lens.

The Home Cinema. Projectors for sub-standard films are made in a wide variety of models, from simple low-power machines for projection in small rooms to high-class projectors suitable for use in halls. Each sub-standard gauge has its own range of projectors, while there are certain models which will project two, and in some cases three, different gauges of film. It is usual for the projector to incorporate an electric motor which drives it, and the models for home use may be connected to any ordinary domestic electric supply.

Operation is simplicity itself, and there is no danger of fire because all sub-standard film is "safety" film, which burns less readily than ordinary paper. In addition to personal films of one's own taking a wide

educational value of the cinema in the home is now a factor which is steadily gaining recognition.



Cinematography. Fig. 3. A more elaborate projector, the Bolex G3, for films of three gauges. Silent running, no flickering, and enclosed geared mecha-nism are some of its advantages.

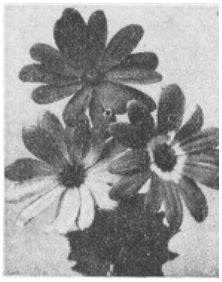
Screens for home projection are generally of stout fabric mounted on a wooden roller, the surface of the screen being coated either with a medium containing aluminium bronze powder, or with an adhesive preparation covered with myriads of microscopic glass beads. The beaded screen is claimed to yield a better screen picture than any other type yet evolved.

Sound films and sound film projectors are now available in 16mm. and 17.5mm. gauge (the latter exclusive to Pathescope home talkies), and the presentation of sound films within the home now presents no difficulties other than a somewhat heavier outlay. Operation is simple, and no intimate technical knowledge is required, the results being comparable with those achieved in the public cinema. It is usual to hire, rather than to buy, sound films, and numerous libraries exist from among which the home sound film projectionist has an extensive choice of films.

Attempts have been made to popularise sound film-making for amateurs, and at least two makes of 16mm. sound film cameras are available for amateur use; but it is doubtful whether personal sound films will ever displace the personal silent film. Apart from the fairly high cost, the technique of sound film-making imposes heavier demands than the silent film, not only on the capabilities of the amateur cameraman-director, but also upon the histrionic abilities of the untrained "subject."

CINERARIA. This is one of the showiest of all greenhouse flowers, and is in full beauty in spring and early summer. There are large-flowered and small-flowered varieties in innumerable bright colours. The latter, of which there are star-flowered and cactus-flowered types, are very decorative; they form plants 2 ft. or so high which bear a profusion of bloom. The large-flowered sorts bear one large head of bloom and grow about 12 in. high. A new type, intermediate between the two other types, has now been raised.

Cinerarias are grown from seeds sown in May in pots or pans of light sifted soil in greenhouse or frame; the plants will flower the following year and are thrown away after the blooms are over, a fresh supply of plants being raised annually. When large , enough to handle, the seedlings are put in 3-in. pots and later on into pots 5 in. wide. During the summer months they should be grown in a cold shady frame, the pots being set on ashes. They must have cool moist conditions. In September they are brought into the greenhouse: a temperature of 45° to 50° is high enough. If large plants are wanted repotting into 6-in. or 7-in. pots should be done in February.



Cineraria. Three blossoms of this large-flowered greenhouse plant.

A suitable soil compost consists of loam two-thirds, leaf-mould and decayed manure one-third, with a free sprinkling of sand. The plants must be kept free from greenfly by fumigating occasionally, or by using an insecticide.

CINNAMON. The bark of a tropical tree, cinnamon is used as a condiment and stimulates digestion. Cinnamon water in tablespoonful doses half an hour after meals is sometimes used in flatulent indigestion; or compound cinnamon powder might be used in doses of 10-40 grains. The dose of the bark is 10-30 grains, and the powdered bark has been suggested as a prophylactic in German measles and measles, children exposed to infection being given as much as will lie on a sixpence or a shilling with the morning and evening meals. The dose of cinnamon oil ½ to 3 minims. It may be used, dropped on sugar, in catarrh and influenza. It is also used as an application for toothache and for warts.

Cinnamon sugar is useful in the kitchen. Put 4 sticks or rolls of cinnamon in a mortar with ½ lb. loaf sugar. Pound them finely and rub them through a coarse hair-sieve. Put the powder into a bottle and keep it tightly corked. Use it for adding to cakes, etc.

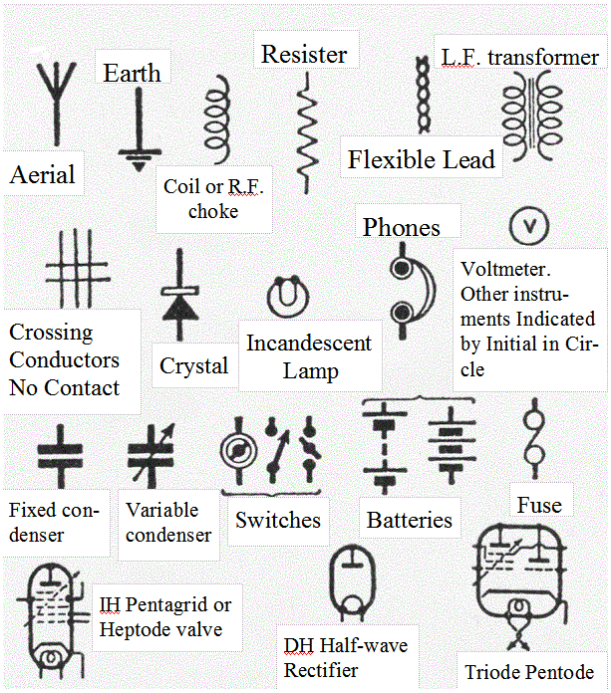
CINNAMON BUN. These are made with ½ lb. flour, ½ lb. barley flour, 2 teaspoonfuls cream of tartar, 1 teaspoonful bicarbonate of soda, 3 oz. sugar, 2 tablespoonfuls molasses, 3 oz. margarine, 2 teaspoonfuls ground cinnamon, and 1 gill milk. Mix together all the dry ingredients. Melt the margarine and the molasses, warm the milk, and blend the soda with a little extra milk. Add it to the milk and mix the whole to a stiff dough. Shape the buns quickly and then bake them in a hot oven for 20 minutes. This should make from 15 to 20 buns.

CINNAMON CAKE. Iced or plain, this makes a change for afternoon tea. To prepare it, beat up 2 oz. butter with ¼ lb. sifted sugar, and when the two are well creamed, add to them a little less than 6 oz. flour, ¾ teaspoonful baking-powder, 2 beaten eggs, ½ gill milk, 2 good saltspoonfuls each of powdered cinnamon and nutmeg, and a pinch of salt. Turn the mixture into a well-greased tin and bake for about ¾ hour in moderate oven.

Cinquefoil. *See* Potentilla.

CIRCUIT. In electricity this is the path traversed by the electric current. If the positive and negative terminals of a galvanic battery or accumulator be connected by a wire, a circuit is formed, the current flowing from one terminal through the wire, back to the other terminal, and through the battery. *See* Battery; Bell; Burglar Alarm; Dynamo; Electric Lighting.

CIRCUIT DIAGRAM. This is a graphic representation of the internal or external connexions of a wireless receiver or other electrical apparatus, in which symbolic rather than pictorial methods of denoting the various parts are used. Some of the chief symbols are shown in the illustration. *See* Wiring.



Circuit Diagram. Showing the principal symbols used in wireless and other diagrams, such as house wiring.

CIRCULATION: Of the Blood. In the human body the blood flows continuously in a circle, being purified at one stage of the journey and then redistributed.

From the limbs, head, chest and abdomen it finds its way into the right upper chamber (right auricle) of the heart. When the heart beats, the walls of this chamber contract down, forcing the blood through a valve into the right lower chamber or ventricle. This ventricle has thick muscular walls, and when it in its turn contracts, the blood is forced into the pulmonary artery and reaches a network of thin-walled little vessels, called capillaries, threaded amongst the air cells of the lungs. Through the walls of these tiny vessels, or capillaries, there is an interchange of gases between the blood and the air in the air-cells of the lungs, carbonic acid gas passing out and oxygen passing in.

The purified blood is collected into the pulmonary veins and carried to the left upper chamber of the heart (left auricle). Here, again, at the start of the heart beat, the blood passes through another valve, flowing into the left lower chamber or left ventricle of the heart. The walls of this chamber are very thick, and when they contract the blood is forced into the main distributing artery, the aorta, and reaches every portion of the body. The farther it goes from the heart the smaller become the branches of the arteries through which the blood passes, until finally it enters into the minute capillaries. The blood is then collected into veins which constantly increase in size and finally empty their contents into the right upper chamber of the heart.

The main bulk of the blood of the body is thus constantly moving through the circle. The blood of the walls of the intestines, however, after it has absorbed certain of the products of digestion, nutriment, etc., is carried by the portal vein to the liver. Here it passes again through capillaries, giving up certain of its constituents, and being collected again into a large vein, which in turn carries it to the right auricle or upper chamber in order to begin a new cycle.

Impairment of the circulation, may be general, and may be due to heart, lung, or kidney disease, or to anaemia amongst other conditions; or it may be local, as in piles, or chilblains, or Raynaud's disease. The person who always complains of cold hands and feet should keep his bowels freely regular, and take plenty of plain food, including fats. He should take open-air exercise, and should massage the affected parts. A sufficiency of woollen clothing should be worn. *See* Heart; Lung.

CIRCUMCISION. Wherever in infancy the foreskin is notably long, and cannot be retracted easily and thoroughly, circumcision should be performed. The operation is a minor one, and can be performed by the doctor in the baby's home. If this is not done, the secretions of the glands become dried and foul, causing local irritation, which may lead to other troubles.

CIRRHOSIS. Whenever the special tissues of an organ, such as the liver, kidney, or lung, are, as a result of disease, replaced by ordinary fibrous tissue, the condition is described at cirrhosis. Cirrhosis of the kidneys is the condition present in the small red kidney of Bright's disease (q.v.). Cirrhosis of the liver is a common result of prolonged over-indulgence in alcohol, or may be due to infectious diseases.

Nausea in the mornings, diminished appetite, a sour taste in the mouth, and a pallor of the skin, together with a gradual loss of energy and perhaps loss of weight, are the symptoms usually first noted in cirrhosis of the liver. The veins over the abdomen become engorged with blood and show through the skin as noticeable blue lines. Fluid escapes from the overcharged veins and collects in the abdomen, setting up dropsy. The patient has difficulty in breathing, through the pressure of the fluid in the abdomen

pressing upwards against the diaphragm.

No treatment will bring a cirrhosed liver back to its normal healthy state, but much can be done to retard the advance of the disease. The first step is to give up alcohol in any shape or form. The diet must be reduced to the simplest and most easily digestible form. Milk diluted with alkaline waters, vegetables, custards, etc., should be prominent in the diet, while heavy meats and all rich, highly spiced foods should be avoided. Plenty of plain water or mineral water may be drunk between meals, so long as there is no evidence of fluid in the abdomen. Constipation must be avoided.

Diarrhoea is often troublesome; but as much of the surplus fluid in the system is in this way got rid of, it should not be checked unless excessive, and not without advice. The following mixture is useful for the purpose:

Carbonate of calcium	½ oz.
Phosphate of calcium	½ oz.
Carbonate of bismuth	1 oz.

Mix thoroughly and take one teaspoonful every three hours, until the diarrhoea is checked. *See* Constipation; Diarrhoea.

CISTERN: In the House. As receptacles for water, cisterns are generally of galvanised iron, rectangular in form and open on the top. Usual stock sizes vary from 2 ft. in length, 16 in. wide and 15 in. deep, having a capacity of 20 gallons, to the 1,000 gallon tanks measuring some 9 ft. by 5 ft. by 3 ft 6 in. A durable cistern should be made of 16 gauge or 14 gauge steel plate, with closely riveted corners, and have strengthening angles at all corners and edges.

When fitting up a cistern it is well to bear in mind the very considerable weight of the water and to provide ample support. The cistern should always be placed as near to a wall as possible, if resting on the ceiling joists, and, further to distribute the load, should rest upon stout bearers of wood at least 4 in. by 2 in. and extending for 18 in. or so on each side of the cistern. *See* Ball Cock; Bath; Central Heating; Water Supply.

Cistus. This is a name of hardy and half-hardy perennial shrubs, also known as rock roses. *See* Rock Rose.

CITRATE OF MAGNESIA. Effervescent citrate of magnesia is a pleasant laxative and cooling medicine in doses of 1 to 3 drams. A solution of magnesium citrate, with the same properties, can also be obtained, the dose being 5-10 fluid oz. *See* Aperient.

CITRIC ACID. Obtained from the juices of fruits such as the lemon, citric acid in the proportion of about ½ teaspoonful to 2 tablespoonfuls of water makes a solution about as strong as lemon juice. The dose of citric acid is 5 to 20 grains. A weak solution increases the flow of saliva, and so is often useful in allaying thirst in fever cases. Sodium citrate is frequently added to the cow's milk given to hand-fed infants, in the proportion of 1 grain to the oz. Tablets containing 5 or 10 grains may be obtained for the purpose.

Effervescing drinks are made with citric acid, such as the following. In half tumbler of water dissolve 20 grains citric acid; in another tumbler half full of water dissolve 30 grains bicarbonate of potash. Pour the two half tumblers of liquid into one large tumbler and stir.

A good home-made beverage may be prepared by boiling the peel of a lemon in a saucepan containing ¾ pint water and ¾ lb. sugar. When these have boiled for 4 or 5 min., pour on ½ oz. citric acid, adding the juice of a lemon when the drink is almost cold. Pour a tablespoonful in a tumbler and fill up with plain water or soda water.

CITRON: The Fruit. The fruit of the citron tree resembles a large lemon, with much the same flavour and medicinal qualities. *See* Candied Peel; Lemon.

Citron: The Wood. This is sometimes used by cabinet makers, and is that of the sandarac tree. *See* Wood.

Clamp. The word is largely used to describe the various forms of cramps used in many trades. *See* Cramp.

CLAP BOARD. This name is frequently applied to a feather-edged board used as a weather boarding. It is also given to an inferior quality of oak imported from Norway, white coloured streaks distinguishing it from wainscot oak. Both materials are inexpensive. *See* Board; Wood.

CLAPPED BREAD. Also called clap-bread, this is much made in Lancashire and Cheshire. Two wooden spoons and a girdle, or griddle, are the utensils required, and if a girdle is unobtainable a thick baking sheet must be substituted.

To make it, put about six tablespoonfuls of oatmeal in a basin with a small teaspoonful of salt. Mix these well, and add sufficient cold water to make a stiff paste, but it should not be dry enough to crumble. Shake a little oatmeal on the board, turn the paste on to it and pat it out with the two wooden spoons as thinly as possible. It is this patting or clapping that gives the bread its name, also its characteristic shortness. Dredge the paste with more meal if it sticks, and put the girdle on the fire to heat whilst the making is in progress. The cakes should be about the size of a breakfast plate.

When ready, dust the girdles thinly with oatmeal and carefully slip on a cake, one or more according to the size of the girdle. Bake them on the top of the fire until they are crisp, turning them occasionally. They may be served hot and buttered, or cold. They keep in dry tins, but need to be reheated. At first it is wise to mix only sufficient for one cake, as the meal dries so rapidly.

CLARET. A great proportion of the wine drunk as claret is but vin ordinaire, or the secondary wine of the country, for the prime growths fall far short of the demand. All clarets need a full six months in bottle before they are fit to drink. Fine clarets will mature in bottle for 30 or 40 years. When maturing, the wine should be kept at an even temperature of 60° F., and not exposed to sunlight. Claret will not keep sound for

demand. All clarets need a full six months in bottle before they are fit to drink. Fine clarets will mature in bottle for 30 or 40 years. When maturing, the wine should be kept at an even temperature of 60° F., and not exposed to sunlight. Claret will not keep sound for more than 6 or 8 hours after being opened. It should be drunk at the temperature of a comfortably warmed room (65° to 70°). The best way is to place the wine on the dining-room sideboard or mantelpiece for an hour before meals, and then decant. At a formal dinner-party, where several wines are given, claret is served with the entrees or roast. *See* Wine.

Claret Cup. The following is a recipe for claret cup. Take a bottle of claret, a tumbler of sherry, a bottle of soda or seltzer water, the peel of a lemon, a slice of cucumber, and sugar to taste. These should be mixed together, and served iced in a glass jug or bowl.

CLARIFYING. Any pieces of fat left over from meat or bacon, or the fat that is skimmed from the surface of stock, can be clarified and utilised in various ways. Pieces of fat should be cut small and placed in an iron or steel saucepan with sufficient cold water to cover them, slowly brought to the boil, and simmered until they look dry and shrivelled. The liquid is then strained into a jar or basin, and when cold will be a firm white cake of fat.

The fat skimmed from the stock-pot should be covered with boiling water and left to cool. Any impurities can be scraped away from the underneath of the fat when it has solidified. Cold water should be poured over dripping left in the tin in which meat has been baked; when the fat has set it should be lifted and the water poured away. Fat that has been used several times for deep frying can be clarified by being poured while hot into a basin containing cold water, well stirred and left to solidify. Cooked or uncooked fats may be clarified and are best kept separate.

CLARINET. Generally made of cocus wood, the clarinet comprises five parts: the mouthpiece, the socket, the upper joint (fingered by the left hand), the lower joint (fingered by the right hand), and the bell. The tube is pierced with holes stopped by the fingers, and is fitted with keys which affect other holes. The number of the keys varies; it is usually 13, but with the Boehm system this is considerably increased. The compass is over three octaves, and is divided into three registers, each completely chromatic.

The reed should be of medium strength; if too flexible or too stiff, the tone will be either weak or harsh. Fix it carefully on the flat side of the mouthpiece of the ligature. Place the two joints together, with the finger-holes in a straight line, and add successively the socket, the mouthpiece, and the bell. Behind the lower joint is a projecting rest, under which the right thumb is placed, so as to support the instrument.

The following is the basic fingering of the clarinet, and it should be committed to memory before trying to produce a sound.



Clarinet on Boehm system (Barnes & Mullins)

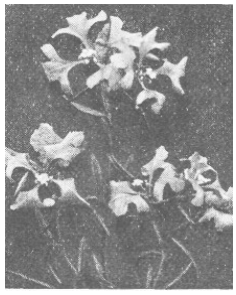
Right hand. 1st finger works keys 9 and 12 and stops hole 4 ; 2nd finger stops hole 5; 3rd finger works key 5, and stops hole 6; 4th finger works keys 3 and 4.

Left hand. 1st finger works key 11 and stops hole 1: 2nd finger works key 10 and stops hole 2; 3rd finger works key 8 and stops hole 3; 4th finger works keys 7, 1 and 2; thumb stops the hole at the back of the upper joint.

To play, draw the lower lip over the teeth so as to obviate their contact with the reed, put about half of the mouthpiece in the mouth, the reed gently touching the lower lip, and then draw the upper lip round the mouthpiece, in order that no breath may escape. Take the breath through the nostrils or through the sides of the mouth, but on no account through the instrument. Press the tongue against the upper teeth and pronounce the word "too," which will cause the breath to pass between the reed and the mouthpiece. Keep the pressure of breath steady. To get different sounds, study the table of fingering given in your instruction book, where also will be found exercises for the production of tone.

An inherent defect in the instrument is that many notes are difficult to get in tune. Correct intonation can only be acquired by steady, well-directed practice incontrolling the breath. After use, with a soft duster remove from the interior any moisture caused by the condensation of the breath. *See* Bassoon.

CLARKIA. A showy hardy annual of which seeds are sown out of doors in March-April where the plants are to bloom from July onwards. There are two types: elegans, which grows 2 feet high and produces charming decorative flower sprays, and pulchella, which is shorter and more graceful. Each type is represented by varieties of rose, purple, salmon and other colours.



Clarkia. Single mauve variety of this showy hardy annual.

CLARY. The leaves of this aromatic plant of the sage family are sometimes used for flavouring soups and for seasoning, and the flowers for flavouring fermented drinks. The lower leaves are large, rough, crimped

toothed, and grey-green in colour. The clammy, quadrangular flower-stem rises about 2 ft. high, and bears pale blue or lilac flowers in small clusters. The plant is perennial by nature, but is best treated as a biennial. The seed should be sown thinly in spring, and the plants set out about 18 in. apart when 3-4 in. high. The first leaves will be ready for picking late in summer. Its use has almost vanished, but in old-world or historical plant collections it cannot be ignored.

CLASP NAIL. Used for general woodwork, the clasp nail is of cut steel from 1 in. to 6 in. long. Its shape is shown in the illustration. A smaller type, the wrought clasp nail, with the head and ears in the form of a barb, has considerable drawing power, holds firmly, and is difficult to withdraw. Clasp nails should be driven in with the wide part of the nail the same way as the grain of the wood.



Clasp Nails

CLAUSTROPHOBIA. A condition of uneasiness and apprehension is experienced by certain people when they are in closed spaces. Known as claustrophobia, it is one of the effects of neurasthenia (q.v.), and may be contrasted with agoraphobia, the term used for fear of open spaces.

Clavicle. *See* Collarbone.

CLAW AND BALL. In furniture this term is used for the terminations found in many chair and table legs of the early part of the 18th century. The way in which the claw grips the ball varies, and much of the interest and value of the pieces lies in the skill with which the modelling is executed. It is generally associated with the introduction of mahogany into the cabinet making trade, and is almost always found in this wood. *See* Cabriole Leg; Chair; Chippendale; Table.

CLAWFOOT. This is a deformity of the foot in which there is a marked increase in the hollow of the sole. The toes are also bent backwards towards the instep, and as a result of those changes the foot is much shortened. The condition often begins in early life, and should be thought of where a child is awkward on its feet and tends to stumble. The treatment recommended is perseveringly to bend up the foot several times on three or four occasions each day, till the angle in front of the ankle is less than a right angle. Care should be taken that a long enough boot is provided, and this should have a bar about ½ in. thick placed beneath the tread, to throw the front of the foot up. *See* Foot.

CLAW HAMMER. This is a hammer with a claw-shaped tail for extracting nails. The ordinary cheap kind has a malleable cast head, and is only adapted for very light work. The Kent or Canterbury is of solid steel, with forged side straps; a medium size weighing 1 lb. is suitable for household use.



Claw Hammer. Illustration showing method of holding when extracting nails.

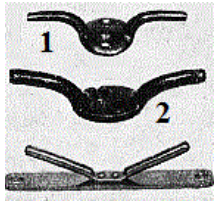
CLAY: As a Soil. Clay soil is difficult to cultivate because in continued wet weather it becomes sodden and in prolonged dry weather it cracks. Yet most trees, shrubs and hardy plants flourish in well tilled clay soil.

The best way to lighten clay and render it friable is to dig it deeply in the late autumn, and leave the surface rough so that the winter frosts and moisture can percolate and disintegrate it. Clay land is greatly improved by adding burnt soil, lime, leaf-mould, sand, sifted coal ashes, wood ashes, road grit, old potting soil and strawy manure.

Clay is sometimes considered as being dangerous to build upon; but except on unsuitable or improperly drained sites a clay soil is quite satisfactory if the foundations are taken deep enough to be beyond atmospheric action. The whole area beneath the house should be covered with six inches of cement concrete. The great thing to avoid on a clay soil is waterlogged ground.

CLAYTONIA. These pretty little plants of the Purslane family are low in habit and suitable for the rock garden. Sibirica, rose and virginica, white, are readily grown from seed sown in spring. They thrive in shade in ordinary soil, if not stiff, but loam and leaf-mould suit them well. Other species are caroliniana and perfoliata, the latter an annual. Claytonia is sometimes described variously as the Cuban spinach and the Chinese chickweed, though it is related to neither.

CLEAR COLE. Before distempering wood or plaster the pores are first filled with a coating of medium strength size to which a little whiting has been added. This is called clear cole. *See* Distemper; Plastering.



Cleats in common use. 1. Best quality cast brass. 2. Japanned cast iron. 3. Malleable iron or cast brass, on plate.

CLEAT: For Fastening. A cleat is used for securing a cord or line by twisting it about its projecting horns. It is useful for many purposes in the home, such as holding a fanlight or greenhouse skylight cord. Cleats measure from 2½ to 6 in. long, and are simply screwed in position. They are made of cast iron, superior varieties in malleable iron; the best are of cast brass, burnished and lacquered or electro-plated.

CLEFT PALATE. This is a congenital deformity in which the roof of the mouth shows a cleft down the

centre. It may be associated with hare-lip. The only treatment is an operation, which may be performed between the third and sixth months after birth, though some surgeons prefer to wait till between the second and third years.

CLEMATIS. One of the loveliest of hardy climbing plants, represented in gardens by many species and varieties. If a careful selection is made, one or another will provide bloom from May until September.

The successful management of clematis depends chiefly on correct preparation of the soil and pruning. As clematis is long-lived, it is worth while making a hole 2 ft wide and 18 in. deep for each plant; well decayed manure and a free scattering of mortar rubble should be mixed with the excavated soil before it is returned to fill the hole. Clematis is grown in pots by nurserymen and may be planted at any time of the year, though early autumn and spring are the best seasons. If the roots are matted together they should be soaked in water to remove the soil; the roots can then be disentangled to some extent and spread out at planting time. Although the clematis loves the sunshine, the base of the plant should be placed among other low-growing plants.



Clematis. Flowers of this very decorative climbing plant.

There are several types or groups of clematis, and they need different pruning. Those varieties belonging to the Jackmanni and viticella groups should be cut down in February to within about 10 in. of the base of the previous summer's growth; they bloom from July onwards on fresh shoots of the current year's growth. Varieties which need this kind of pruning are:

Ascotiensis, lavender blue; Comtesse de Bouchaud, old rose, very beautiful; Gipsy Queen purple; Jackmanii, purple (and all other Jackmanii varieties); Kermesina, reddish; Lady Betty Balfour, purple; Mme. E. André, reddish; Mme. Grange, reddish violet; Mrs. Cholmondeley, light blue; Star of India, reddish; Thomas Moore, violet, purple; Ville de Lyon, carmine red.

Large flowered varieties of the other groups, which bloom in May and June, need quite different pruning. It is sufficient to look over the plants in February and to cut out weak, useless shoots to give more room to the others, especially those of the previous year's growth. Long, straggling shoots should be shortened, but there must be no severe cutting back, or they will bloom sparsely. Some of the chief varieties needing this treatment are:

Beauty of Worcester, violet blue; Crimson King, crimson; Duchess of Edinburgh, white, double; Fairy Queen, pale flesh pink; Henryi, cream white; Edward VII, violet; Lady Nevill, lavender grey; Lady Northcliffe, lavender blue; Lasusturn, purple blue; Marcel Moser, mauve shade; Nelly Moser, pale mauve; The Queen lavender.

There are some vigorous and beautiful kinds of small-flowered clematis. All are rampant, and soon cover a large area. It is impossible to prune them systematicallym, but they ought to be thinned out occasionally after flowering to get rid of old, worn-out and weakly shoots. Clematis montana bears white flowers in May; flammula, which is in full beauty in August, has sweet scented flowers; vitalba Traveller's Joy or Old Man's Beard, exceptionally rampant, bears white flowers in summer followed by decorative fruits in autumn.

Clematis tangutica bears small yellow flowers in September; indivisa, white flowers in spring, is tender and suitable only for the greenhouse; recta is a bush clematis which bears white flowers in summer; heracleafolia is of somewhat shrubby growth and bears small blue flowers in summer.

The easiest way to increase clematis js by layering the shoots in July. Cuttings may be inserted in sandy soil in a frame in September. Most of the plants sold by nurserymen are grafted on clematis vitalba.

A disease which causes the sudden collapse of the plant sometimes attacks clematis. If all the stems are cut down, fresh growth may spring up from the base; if it does not, nothing further can be done. *See* Climbing Plant.

CLERGYMAN'S THROAT. Chronic inflammation of the tissues at the back of the throat, and perhaps of the vocal chords, is commonly caused by over use or improper use of the voice. In this condition, which is termed clergyman's throat, the lining at the back is covered with little elevations varying in size from a pin-head to a pea, or even larger in some cases. The irritation is aggravated by a dry cough, and the voice gradually becomes weak and husky.

In treatment, any defect of the general health should be remedied. If the granules at the back of the throat are prominent they should be destroyed by galvano-cautery. The voice must be rested. The following gargle may be used four or five times a day.

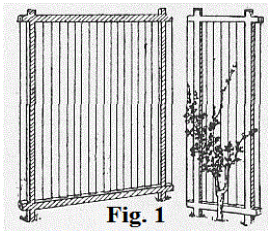
Tincture of krameria	1 dram.
Tincture of myrrh	1 „
Compound tincture of lavender	15 minims
Glycerin of borax	4 drams
Water to make	6 oz.

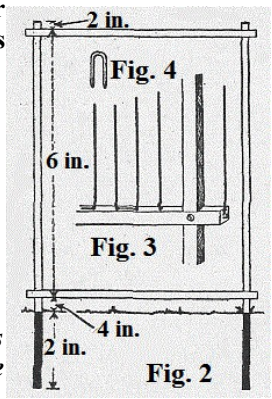
CLICK BEETLE. Several species of click beetle

are found in gardens, and, though as beetles they are harmless, the females lay eggs from which are hatched the garden pests known as wireworms (q.v.).

CLIMBING PLANT or Climber. The uses of climbing, trailing, and rambling plants in the garden petiolaris, and the ivy, of which there are many varieties with green or variegated leaves. Rose, clematis, honeysuckle, jasmine wistaria, ornamental vine, passion flower (for sunny walls), Cotoneaster horizontalis, Ceanothus veitchianus and the firethorn (pyracantha) are some of the chief hardy climbing plants and shrubs.

Before planting, it is necessary to prepare the site thoroughly by making a large hole and filling it with manured soil: climbing plants on a wall must be watered freely in very sunny weather. Certain annuals make good climbing plants for trellises. Chief among them are canary creeper, climbing nasturtium, ornamental gourd, Japanese hop and sweet peas. Seeds are sown under glass in March, the seedlings being planted out in May, or seeds may be sown out of doors in April.





Climbing Plant. Fig. 1. Trainers made of scantling withwire stretched vertically.
Figs. 2-4. Diagrams for making trainers.

Favourite climbing plants for the greenhouse are abutilon, fuchsia, heliotrope, Clematis indivisa, the scarlet trumpet honeysuckle (Lonicera sempervirens), roses, lapageria, Cobaea scandens, bougainvillea and Cassia corymbosa. See Arch; Clematis; Fuchsia; Pergola; Trellis.

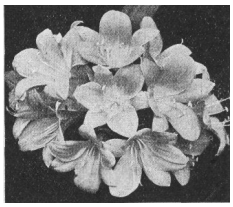
Clinical Thermometer. *See* Temperature; Thermometer.

CLINKER: Its Uses. A hard, rocklike residuum is obtained under the name of clinker from gasworks, brickyards, and other places where furnaces are in operation. It is cheap, and has many applications, especially for making garden paths and for inferior grades of concrete.

In large lumps clinker may be used for rock gardens; its black colour can be altered to some extent by coating it with cement wash. The finer grades, when sifted through a sieve, make a good aggregate for cement partitioning blocks intended for subsequent facing.

The clinker from brickyards being very thoroughly burnt is generally fine, and makes a good path for a garden when laid to a depth of 3 in. to 4 in. and thoroughly consolidated with water and a heavy garden roller. A heavy clay soil can be lightened considerably by an admixture of fine clinker, but it must be used sparingly. A shovelful per square yard is sufficient. See Brick; Cement; Concrete.

CLIVIA: A Greenhouse Plant. Belonging to the amaryllis order, clivia is an evergreen, flowering plant, with reddish-yellow blooms in the spring. It is a greenhouse plant, and is raised from seeds sown in March, and potted in a mixture of loam and sand, with some well-rotted manure. The roots can be divided after flowering. A winter temperature of 45° to 50° is suitable. It is a good window plant.



Clivia. The orange-yellow flowers of clivia, a fine window and green-house plant.

CLOAK. These garments are always more or less in fashion. Cloaks for evening wear, or in waterproofed fabrics, are fairly simple for the home dressmaker to evolve with the aid of a good pattern service.

The simplest way to convert a Paisley or other shawl into a cloak without cutting the material is to adopt the burnous or Arabian style.

It may be made from 2 ½ yards of material not less than 40 in. wide, a full length burnous requiring a 50 in. material. The shawl or material is merely doubled across to bring the two edges together, and one set of selvedges are caught together at a point about a foot from the fold to form a hood, which hangs down the back, and shapes the neck sufficiently to make the cloak sit on the shoulders. The top front corners are turned back to form revers, and each point, as well as the hood, can be finished with a tassel. The fronts of the garment may be fastened with a clasp, or, in the case of a shawl with a surplus of material, the fronts are draped across and held in place by the hand.

A wide circular cloak, cut without a join and known as a cavalier cloak, is attached to each shoulder with a buckle of elaborate ornament. It has much fullness, which may be drawn across the front and over the left shoulder, and allowed to hang in folds down the back.

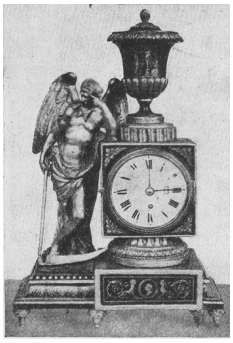
CLOCHE: In the Garden. Cloches are domed covers of thick glass, very useful in the garden, especially in French gardening, where they are used to cover lettuces, cauliflowers, and other plants which are grown under the system of intensive culture. *See* Bell Glass.

CLOCKS: FOR USE AND ORNAMENT

Choosing Them and Keeping Them in Good Order

Subsidiary articles to the one below deal with Alarm Clock; Cuckoo Clock; Grandfather Clock. See also Watch

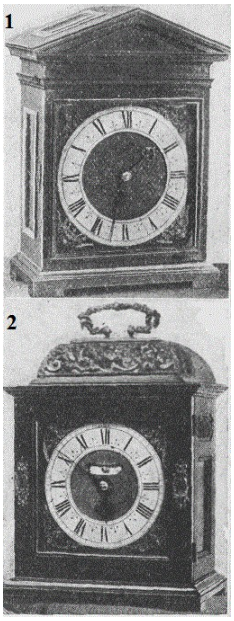
Chamber clocks, as the early 17th century examples were called when clocks first began to appear in English houses, were often referred to as lantern or bird-cage clocks. They had no pendulum, as it was not introduced until about 1658. A bell on the top was struck with a hammer as the hours progressed, and, after winding, the clock lasted a day, or not more than 30 hours. It was common for such clocks to have an hour hand only. These clocks were of brass and the earlier ones had thickly gilt dials. A decorative feature was the fretted ornament surrounding the clock above the dial, often containing a conventional rendering of the crest of the owner, and at the bottom the maker's name. One of the earliest makers was William Bowyer, who in 1642 presented a great chamber clock to the Clockmakers' Company.



Adam style clock, with carved figure of Time with his scythe and surmounted by a vase painted with classical subjects.

An idea of the size of these early English clocks may be gathered from the diameter of the dial, which was from 3 in. to 5 in., though larger examples are known, up to 7½ in. The bigger dials often projected each side of the frame or structural body of the clocks.These lantern clocks continued to be made for quite 100 years. A wooden hood was commonly used over the bell to protect the works from dust.

Clocks by Thomas Tompion (1638-1713) are the most desirable acquisitions, from the collector's point of view. His shop, with a sign of the Dial and Three Crowns, was in Fleet Street at the west top corner of what is now White-friars Street.



Antique Clocks. Top. 1. Ebony bracket clock, late 17th cent. Below, 3. Early 18th cent, clock, with perforated metal top.

Tompion was the chief watch and clockmaker of the time of Charles II. Fine examples of his clocks are to be seen in the Pump Room, Bath, the British Museum, and Windsor Castle. His name and date are usually on the dials of the clocks he made. Two other great clock-makers of the Tompion period are Daniel Quare and Joseph Knibb. During the reigns of William and Mary and Queen Anne, when walnut succeeded oak for clock cases, twisted or corkscrew columns were often seen at the corners each side of the dial, supporting a horizon-tal moulding, sometimes finished with a pediment. When mahogany became comparatively common in the first quarter of the 18th century, it was employed largely and walnut discarded.

Clock cases were made during the reign of George III in rosewood, chestnut, kingwood, pear, and other woods, while ebony, tulip, amboyna, and satinwood were used effectively for inlaying. Bracket or pedestal clocks were simply chamber clocks with enriched wooden cases. French clocks of this period were beautifully decorated often in the Buhl style with delicate inlays of metal and tortoiseshell.

Fig. 2. Act of Parliament clock.

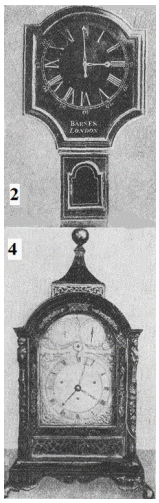


Fig. 4. Clock playing tunes, c. 1750-1760.

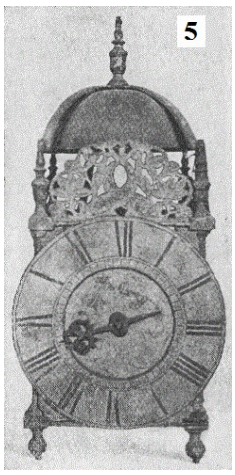


Fig. 5. Brass lantern clock with hour hand only, 17th-18th cent.(Courtesy of C. W. Shapland)

The imposition of a tax upon users of clocks and watches in 1797 resulted in the making of what are known as Act of Parliament clocks. They were used by inn-keepers, who, anticipating the probability of their customers being without watches, put up such clocks in their public rooms. They were, for the most part, very plain, and had a large dial of wood, painted black, with gilt figures, the face covered by a glass. They were hung on the wall, and had an extension below to give sufficient room for the movement of a seconds pendulum. The Act was so obnoxious that it was repealed in April, 1798.

The 18th century bracket clocks, with improvements in mechanism, are reproduced freely. Now that mantelshelves are often absent or so narrow that they do not admit of a large clock, the brackets solve the problem of accommodation. The cumbrous 19th century models in marble have given place to small lacquer-framed clocks with clearly marked dials and strut supports at back, or glass framed clocks.

Mechanism. Figs. 1 and 2 illustrate a type of English clock which is known as a fuzee and chain pendulum timepiece. This variety is the most generally used where a timekeeper pure and simple is required. The plates or frames, A, Fig. 1, usually made of brass, are held together by four brass pillars, pivoted between which is the barrel, B, Figs. 1 and 2. Inside of this is coiled the mainspring, the outer end of which is hooked on to the rim of the barrel, and the inner hooked to the arbor, C, Figs. 1 and 2. This is pivoted between the two caps of the barrel so that the barrel is free to turn; the arbor is also pivoted between the frames, with one end coming through. This end is squared, and fitted

on the square is a ratchet wheel, D, Fig. 1, into which fits a click, E, Fig. 1, to prevent it running back. Round the barrel is wound the chain, F, Figs. 1 and 2, one end hooked to the rim of the barrel and the other to the largest end of the fuzee, G, Fig. 1.

The winding is done from the fuzee, which is pivoted through and keyed on to the mainwheel, H, Fig. 1, but can only turn one way, as between the fuzee and the mainwheel there is a click and ratchet. The arbor which carries the fuzee extends through the plates and the end is squared to fit the key or winder. When it is wound, the fuzee is turned, and the chain begins to wind round the spiral grooves. The other end of the chain, being hooked to the barrel, will pull the barrel round, incidentally coiling up the mainspring, which then has a natural tendency to uncoil itself. Thus it pulls the barrel back again and with it the chain. Since the fuzee is held by the ratchet, it cannot go back. It therefore pulls the mainwheel with it, and thus arises the motive power that keeps the clock going.

The fuzee is a spirally grooved pulley of varying diameter. Its object is to convert the varying force of the mainspring into a constant pressure on the train of wheels. Working on the small end of the fuzee is what is known as the stopwork, J, Fig. 2. which when the fuzee is wound full of chain is drawn into action and catches the hook at the end of the fuzee, thus preventing its being wound any farther.

The motive power is transmitted from the mainwheel to the centre pinion, JJ Fig. 1, which carries the hands. Fixed to the centre pinion is the centre wheel, K, Fig. 1, which in turn gears into the third pinion. L, Fig. 1. Fixed to this is another wheel, the third wheel, M, Fig. 2, which again gears into the escape pinion, N, Figs. 1 and 2, to which is attached the escape wheel, O, Figs. 1 and 2. From here the power is transmitted through the pallets, P, Figs. 1 and 2, by the way of the crutch, R, Fig. 2, to the pendulum, S, Figs. 1 and 2.

The pendulum controls the timekeeping. If it is raised from the point where it is at rest and then released it will, by the force of gravity, fall back to that point, and the momentum it gains in deseent will carry it as far up the other side. If it were not for other factors, viz, the resistance of the air and the friction of the suspending spring a pendulum would go on vibrating indefinitely. The motive power supplied by the clock should only be sufficient to make up to the pendulum what it loses through this cause.

The escapement is the point where energy stored up by the mainspring escapes at regular intervals. The steel pallets swing with the pendulum and alternately release and catch a tooth of the escape wheel. They are so shaped that the forward movement of the escape wheel imparts to the pendulum by way of the crutch the amount of energy required to keep it vibrating.

The length of the pendulum used governs the ratio of the wheels and pinions necessary to show true time. The centre pinion carries the wheel to which the minute hand is attached by means of a sleeve over the extending part of the centre pinion, pinned down friction tight by means of a spring behind the wheel to allow the hands to be moved forward or backward. This is the minute pipe (T, Fig. 1). Geared into this is another wheel of the same size and number, U, Fig. 1, which in turn is geared into the hour wheel, V, Fig. 1, at a ratio of 12 to 1. To the hour wheel socket, W, Fig. 1, is attached the hour hand; thus the minute hand travels round 12 times while the hour hand travels once. Thus the clock mechanism by way of the dial and hands indicates the number of vibrations the pendulum makes, and so, by the length of the pendulum and the ratio of the wheels the hands are made to register the time.

Striking Clocks. The fuzee and chain striking clock, as far as the timekeeping mechanism is concerned, is exactly the same as the timepiece. For the striking train it will be seen that an additional barrel and fuzee and train of wheels are used; the working of the barrel and fuzee has already been explained. The mainwheel in this case, A, Fig. 3, gears into a pinion, B, Fig. 3, carrying a wheel which is called the pinwheel, C, Fig. 3: driven into the web, and at right angles to the wheel are eight pins set at equal distances; it is these pins which raise the hammer, D, Fig. 3, to strike. This wheel gears again into the pallet pinion, E, Fig. 3, at a ratio of eight to one thus for each blow of the hammer this pinion turns once.

Attached to this pinion is another wheel, F, Fig. 3, which in turn gears into the warning pinion, G, Fig. 3, at a ratio of 7, 8, or 9 to 1, according to the speed the clock has to strike. On this pinion is fixed the warning wheel, H, Fig. 3, which in turn works into the pinion carrying the fly, J, Kg. 3. The fly acts as a sort of governor when the striking train is in motion. It will be seen that while the striking train is in motion it will keep lifting and dropping the hammer, which in its fall strikes the gong or bell. The mechanism shown here is the rack repeating system.

Screwed to the hour socket is a disk with 12 steps, called a snail, JJ, Figs. 3 and 4, each succeeding step being nearer the centre; this is what regulates the number of blows to be struck. Close by this and working on a stud is the rack, K, Fig. 4, on the outer edge of which is cut a series of inverted ratchet teeth. The distance of these apart in proportion to the distance from the centres corresponds to the steps on the snail. Extending from the working centre of the rack is a lever called the rack arm, L, Figs. 3 and 4. In the end of this and at right angles is a pin; when the rack comes into action it falls on to the snail, and according to the step it falls on, it allows a corresponding number of the rack teeth to come into operation.

To set the striking clock in motion the minute wheel, M, Figs. 3 and 4, has two pins; as this wheel turns once an hour, one of these pins will come into contact with the lifting piece, N, Figs. 3 and 4, every half-hour. This is a double arm lever which, when lifted by the pin in

(*Continued in page 469*) (*For images of fuzee and striking clocks referred to, see page 468*).

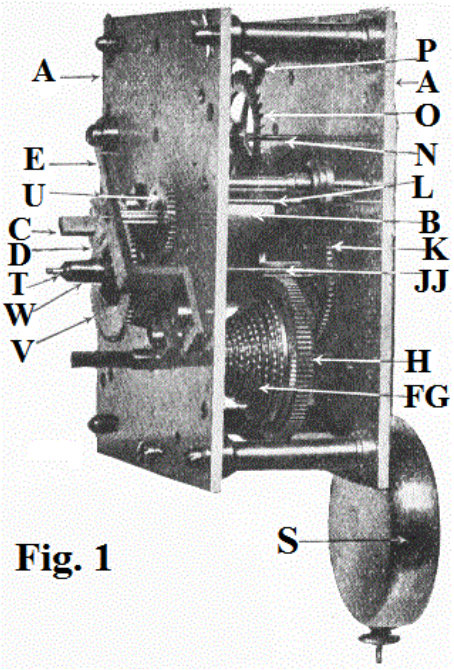


Fig. 1

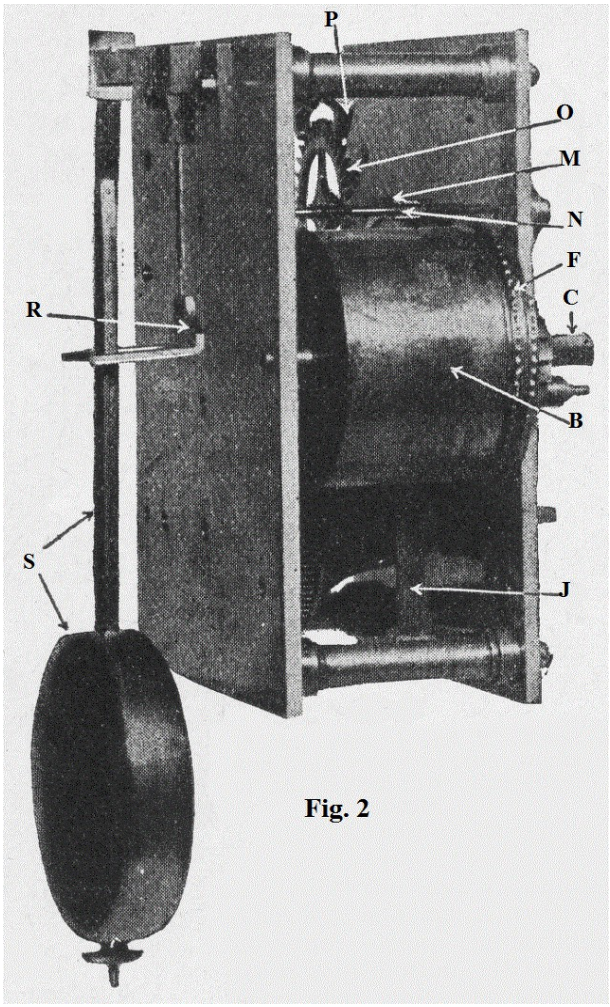


Fig. 2

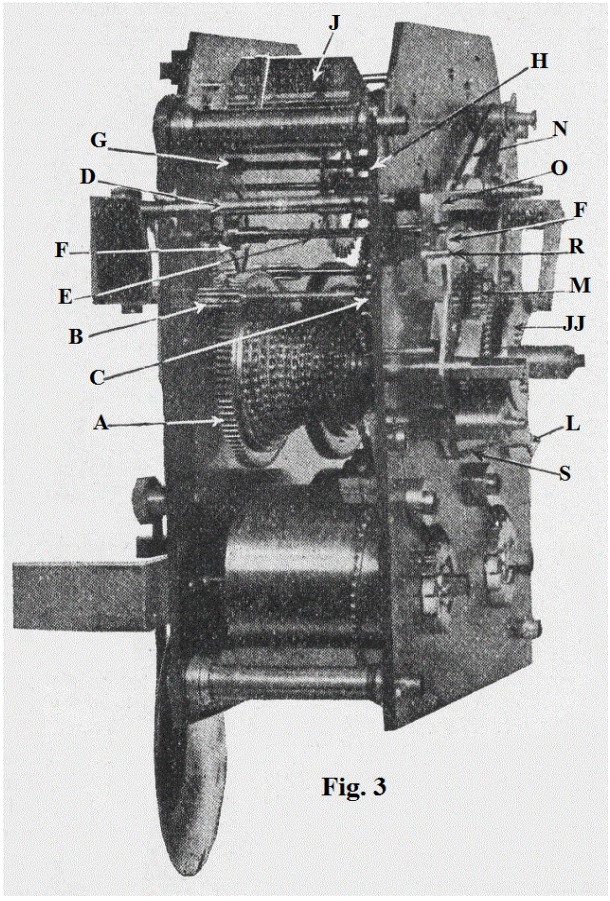


Fig. 3

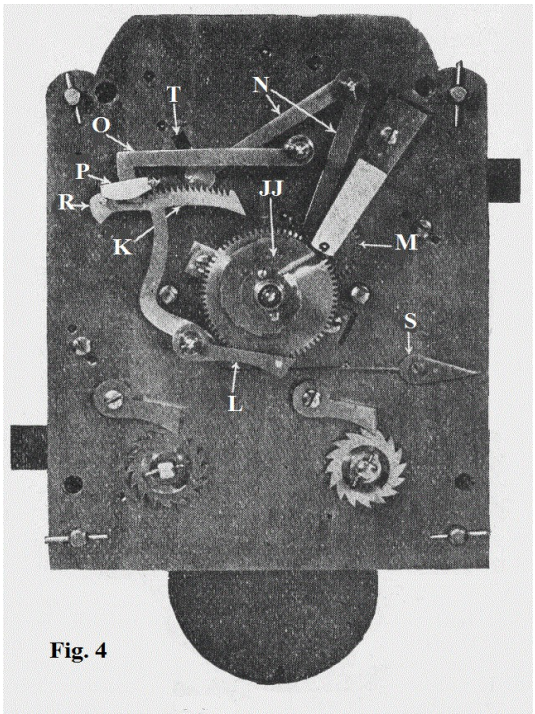


Fig. 4

Figs. 1 and 2. Front and back views of the works of an English fuzee and chain timepiece. (J. W. Benson. Ltd.) Fig. 3. Side and front view of English striking clock. (J. W. Benson. Ltd.) Fig. 4. Front view of English striking clock. (Courtesy of J. W. Benson, Ltd.)

the minute wheel, in turn lifts the rack hook, O, Figs. 3 and 4, by means of a pin on the end. Attached to the extending portion of the pallet pinion which comes through the plate is the gathering pallet, P, Figs. 3 and 4, which is usually squared on and pinned across. When the striking train is at rest it locks on a pin in the rack, R, Figs. 3 and 4.

As the hour or half-hour approaches the pin in the minute wheel gradually lifts the lever, N, Figs. 3 and 4, which in turn lifts the rack hook. In doing this the rack is now free to fall, aided by a spring, S, Figs. 3 and 4, working on a small extension of the rack. In falling, the rack arm pin falls on to one of the steps of the snail. When the rack has fallen, the gathering pallet, and with it the train, would be free to turn, but the train is held in check by what is known as the warning, that is, an extension of the lifting piece passing through a slot in the plate, T, Fig. 4, and catching a pin in the rim of the warning wheel, H, Fig. 3. When the clock reaches the hour or half-hour the pin in the minute wheel reaches the end of the lifting piece, which then falls into its original position and clear of the warning pin and the rack hook.

Now the train is free to move the gathering pallet, turning once to every blow struck. On the gathering pallet is a small nib which as it turns gathers up one tooth of the rack, the rack hook by reason of its shape and position riding out and falling again behind the succeeding tooth. This is repeated until all the teeth are gathered up, when the gathering pallet will come to rest on the pin, R, thus again locking the train. So the number of blows struck depends on the step in the snail on to which the rack arm falls. At the half-hour only one blow is struck. This is done by means of the first tooth in the rack being cut shorter than the rest and the pin in the minute wheel for lifting for the half-hour being placed nearer the centre of the wheel. When it lifts it is only far enough to let go the first tooth of the rack, and therefore the clock will only strike one blow.

French Striking Clocks. These are cheaper than the English fuzee clocks, and on account of their small compass they can be offered in a large variety of cases. Here the fuzee and chain are not used, the mainwheel and spring barrel being all in one. A, Figs. 5 and 6, and the winding is done from the barrel arbor. This necessitates an extra wheel and pinion between the mainwheel and centre pinion on one side and between the mainwheel and pinion on the other, B, Fig. 5. The working of the other parts is fundamentally the same, except that the striking work is locked in a different manner. The gathering pallet in this case has no tail to it, the locking of the train being done by the rack hook, which is fixed to a detent, C, Figs. 5 and 6, pivoted between the plates with an extending arm which catches on a pin in the pallet wheel, D, Fig. 6.

This kind of clock is also fitted with what is known as a Brocot regulation, that is, a shaft passed from the front of the dial to the Brocot box, E, Figs. 5 and 6, which by turning forward or backward turns a wheel and moves up or down a small slide which lengthens or shortens the pendulum.

Pendulum Clocks. When a pendulum clock stops, and, although it has been wound up and re-started, stops again almost immediately, the trouble is nearly always due to unsymmetry of beat. This is easily detected: if the beat is unsymmetrical, the intervals between the sounds of successive ticks are alternately a longer and shorter time, instead of being all equal.

The simplest remedy is to place a small pad of paper or the point of a wedge under the right or left hand side of the clock case, so that the clock is tilted over a little. If the beat is still uneven, but less so than before, some further raising of the same side will be necessary. If on the other hand the beat is more uneven than before, it is a sign that the block or wedge has been put under the wrong side of the clock case; it should be put under the other side and the procedure repeated.

In some kinds of clocks the works are enclosed in a drum-shaped metal case of the same diameter as the clock face, this metal case being a tight fit in the outer ornamental case but not being fixed immovably therein. In clocks of this type the beat may be adjusted by turning the inner case in the outer case by a small amount.

In the case of a clock not provided with the special facility described, it is still possible to avoid the unsightly appearance of the wedge, but the process is one of some delicacy. In many good class clocks the crutch or part which is slotted to receive the pendulum rod is a tight fit on the pallet spindle but is not fixed immovably. Consequently the crutch can be rotated by a minute amount relative to the pallets about the common axis. The procedure is similar to that used in the wedge method. A small adjustment is tried, and the clock re-started; if there is improvement but not yet equality of beat, more adjustment is required in the same direction, while if the first adjustment has made things worse, then the second adjustment should be made in the opposite direction.

In other clocks the crutch may be a wire which is firmly fixed to the pallet axis; in such a case the crutch can be slightly bent with the pliers to one side or the other till the clock is in "beat." It is not generally advisable for the amateur to attempt the cure of other troubles in pendulum clocks, or of any trouble arising in balance-wheel clocks; these are rather matters for the expert.

Regulating a Clock. In the case of a pendulum clock, the pendulum bob is usually held in its place on the pendulum rod by a nut underneath the bob. To make the clock run faster, the nut is screwed up a little, so that the bob is a little higher up the rod. Some pendulum clocks have a small square peg at the top of the clock face, with the letters S and F on either side of it. Such a clock can be regulated without stopping it, the procedure for making it run faster being to turn the peg with a key towards the letter F, and vice versa.

The regulator of a balance-wheel clock is a small

pointer at the back of the clock, which can be moved by hand over a graduated arc towards F to make the clock go faster or towards S to make it go slower. In clocks of French manufacture the letters S and F are replaced by R and A respectively. The balance is a small wheel with a bar across the centre connecting opposite sides of the rim. It is very delicately adjusted and is pivoted in plain conical bearings: it revolves backwards and forwards by the action of a fine spring, called the hair spring. In one movement the wheel winds up the spring; the second movement is caused by the impulse of the spring to regain its normal tension. The regulation of the balance requires great care and the pin should be moved very gradually.

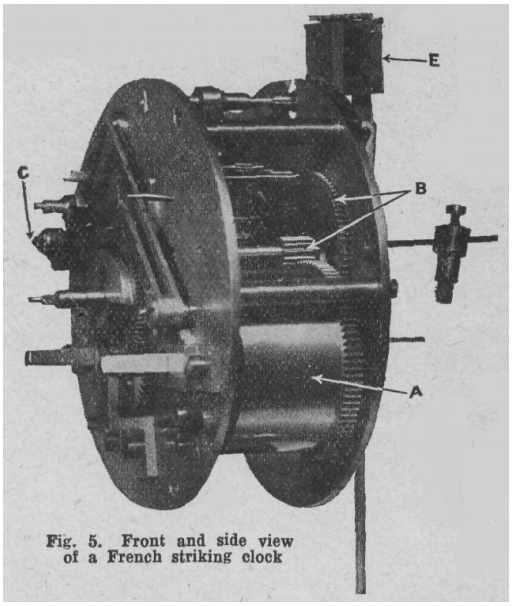


Fig. 5. Front and side view of a French striking clock

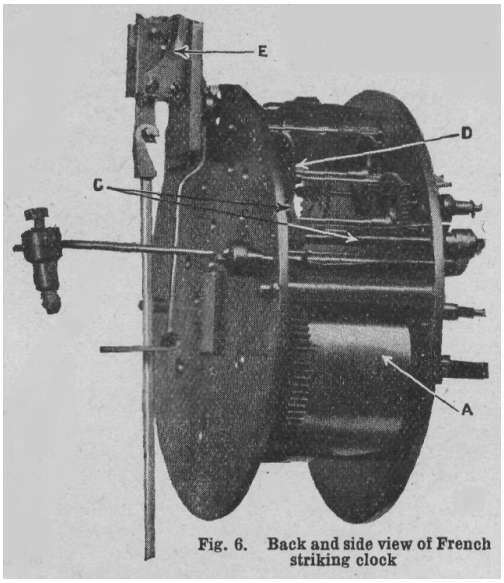
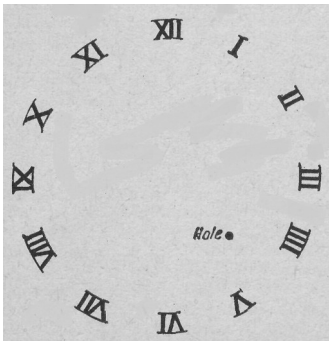


Fig. 6. Back and side view of French striking clock

When setting a clock, if the clock either strikes or has an alarm, the hands must not be moved backwards, but instead must be moved forwards nearly 12 hours. Moving the hands backwards is permissible for other classes of clocks. The case of a clock should never be left open any longer than is absolutely necessary for winding, etc., or else dust will get into the works. If a pendulum clock is moved otherwise than with the greatest care it will be stopped, and may develop an unsymmetrical beat. All members of a household should therefore avoid accidentally moving such a clock, and intentional moving in order to dust behind it should be forbidden.

CLOCK GOLF. The game of clock golf can be played in any garden when there is room to chalk out a circle of 4 to 6 yd. diameter. which is then marked with figures placed exactly as on the face of a clock. A tin, or small flower-pot is sunk for the hole as shown in the diagram, not in the centre, but nearer to some of the figures than to others.



Clock Golf. How the numbers may be marked on the glass to be at unequal distances from the hole

If there are only four players, the game can be one pair against the other; if more, each person scores for himself or herself. A golf ball is placed on the figure I, and the first player, armed with a putter or any other golf club, endeavours to get the ball into the hole in as few strokes as possible. When he has succeeded, the next player takes his turn, and so on until all have played. The player who succeeds in the fewest strokes wins the hole. The ball is then moved to the figure II, and the game proceeds as before. When all the players have played from each figure on the clock face, the game is scored by holes as in ordinary golf.

CLOG. Footwear with wooden soles and leather or fabric uppers, known as clogs, is used for a variety of purposes and in many industries. The English clog should not be confused with the continental sabot, for whereas the former is a wooden-soled boot or shoe, the latter is merely a block of wood, shaped and hollowed to admit the foot. The wood for the soles of a clog is usually either beech, ash, or alder. The first, being a close-grained wood, is less liable to swell and split when soaked; it is therefore invariably used in occupations which entail much standing about in wet places.

Clogs are more comfortable for garden work and on the allotment than boots. The iron-shod soles never wear out, and when in course of time the uppers become perished and cracked, they can be renewed at home. New clog uppers can be obtained at most leather and grindery shops. The clog upper is nailed round the outer edge of the sole in a rebate of about ⅛ in. To affix a new upper, first remove the welting or thin strip of leather which is used to hide the join between the sole and upper. If this is done with care, the welting may be fit to use again. After all the nails are removed the new upper should be lightly attached with a few tacks, and the old welting or a new strip cut to the same size, put into place and freely nailed. *See* Boot Repairing.

CLOSET. Originally the name given to a small private room, the idea of privacy has been retained in the present use of the word for an earth closet, chemical closet, or water closet. The portable chemical closet is convenient for indoor use where a water closet is not available, and is specially adapted for the caravan, boat or temporary building. *See* Earth Closet; Sanitation; Water Closet.

CLOT: Of Blood. The solidified state of the blood when it coagulates constitutes a clot. This is composed of a network of fine strands of fibrin, in which the blood corpuscles are enmeshed, the red blood corpuscles giving it a red colour. At first the clot includes the whole blood, but the serum is gradually squeezed out and the clot contracts.

When bleeding occurs inwardly the clot softens and disappears; if not, its place is taken by new fibrous or scar tissue. When a clot forms in the heart or blood vessels during life it is called a thrombus, and the process thrombosis. A clot of blood on the brain may mean that thrombosis has taken place. *See* Coagulation ; Embolism; Thrombosis.

CLOTH. In all woven cloths two sets of thread, crossing at right angles are interlaced with each other. Compound cloths can be woven with more than two sets, but not with less. Knitted cloths are made by forming a thread or threads into a succession of loops joined to one another. Animal, vegetable, and mineral materials are employed. Wool, hair, and silk appear in the first group; cotton, linen, jute, hemp, ramie, and artificial silk in the second; cloths woven from asbestos, spun glass, and metal wire come into the third.

Widths are limited only by the widths of the machines. Velvets are made as narrow as 16 or 18 in.; trouserings and handwoven tweeds are 27—28 in.; most cretonnes and many linings are 31 in.; dress serges are often 40 to 44 in.; various upholstery cloths are made in 50 in., and the nominal width of many wool cloths is 54 in.

Added width so often means a saving of length in cutting-out that a large proportion of goods are made in broader sizes. Narrow width is an ambiguous term usually implying 27-29 in., and double width 50-58 in. It is much better to specify the breadth in inches for clearness.

Cloth for Government service use is tested by special machinery, which applies tension, note being taken to the pound pressure at which breakage occurs. The ordinary test for wearing power is by the thumbs; when a cloth is so strong that the thumbs cannot be pressed through it, though tightly held and strength exerted, it is considered satisfactory.

Yarns and Weaves. Worsted can be distinguished from woollen by noting whether the yarn fibres are parallel or bunched crisscross. Combed cotton may be told from carded cotton by the evenness in the length of the fibre recovered. Linen differs from cotton in the much greater length of the individual fibres. Spun silk can be told from raw or thrown silk by the fact that the one is made like worsted, from a large number of detached fibres, where the other is made by twisting more or less tightly together a few fibres of virtually endless length. This process does not afford final proof, but is informative so far as it goes.

Another point to be noted in examining detached threads is whether the yarn is tightly or loosely twisted. Tight twisting is favourable to wear, but makes the cloth harder and may militate against its graceful draping or the brightness of its appearance. Tight twisting is sometimes resorted to because the fibre is too short and poor for use otherwise. Hence it follows that cloths which feel very hard and substantial do not always wear well.

Double or two-fold threads are preferred to single for wear, and from a length of the yarn it is easy to tell by rolling one end between the fingers, while holding the other end, whether the thread is single or not. Single-strand yarn disintegrates forthwith into fibre, whereas two-fold splits into two individual threads.

Woven cloth, being composed of two sets of thread, is firmer and stronger the more efficiently these two are bound together. They are never more securely interlaced than in the plain weave seen in handkerchiefs. Cloths are made to feel thicker for being woven in twill or step formation. Their surface is made smoother and more lustrous by satin weaving, in which the thread, after passing under one of the opposing set of threads once, passes over the next five, six, or more. Under given conditions firm and good-wearing cloths can be made in these and in more fancy weaves, but it is not an advantage to the wear that there should be long unbound floats of thread lying on the surface. Woven cloth, on account of its structure, is firmer and less liable to stretch than knitted cloth. Knitted fabrics are used where elasticity is specially required. Cloths are knitted also when stockinette or jersey is in fashionable demand. *See* Braid; Serge; Tapestry; Tweed; Weaving.

CLOTH BALL. This is a compressed tablet, chiefly composed of precipitated chalk and magnesia, used for cleaning white and coloured fabrics, suède shoes, handbags, gloves, hats, etc. It can be obtained in white and in many different tints.

The white cloth ball is particularly useful in cleaning white furs, white satin shoes, and so on. The coloured balls are used for cleaning coloured nap cloths, coloured shoes, velours, hats, and velvet fabrics, pile carpets and rugs.

The methods for cleaning white and coloured fabrics is as follows. Brush well with a stiff clothes-brush, and free from dust as much as possible. The cloth ball is then rubbed vigorously into the nap or pile. Care should be taken that a good deposit of the cloth ball is rubbed into every part of the article, as neglected parts will spoil the effect of the cleaning. Fabrics should be folded carefully with the treated surface on the inside, and put away in a dry, warm place for at least 24 hours.

Shoes and other articles that cannot be folded should be covered to keep free from dust, and put into a warm place for a similar period. At the end of this time the cloth ball powder should be shaken and brushed out, and the article will be found to be almost completely restored to its original freshness and colour. In the case of articles that have been allowed to become very much soiled, a second application of the cloth ball may be necessary.

In suède shoes and suède goods generally, the nap in wear has a tendency to be rubbed down, and the article presents a shiny surface. This is particularly noticeable in shoes and handbags, the rubbed parts presenting a greasy, black appearance. If such is the case, procure a piece of fine sandpaper and gently rub against the nap until the surface is restored. Then apply the cloth ball in the manner already described. To avoid an uneven appearance, the sandpaper should be applied to the whole of the shoe upper, extra attention being paid to the soiled parts. See Fur; Suède.

CLOTHES AND THEIR TREATMENT

Care that Makes for Economy and Good Appearance

This article tells how both men and women can keep their clothes in good condition. See also entries on Darning; Mending; Pressing, and articles on Boot; Hat, etc.

It is not always realized that a small income does not preclude anyone from being turned out well groomed, since appearance depends less upon the extent of the wardrobe than the care taken of it. The chief enemies of woollen garments being dust, damp, and moth, it follows that no clothing should be put away for any considerable period without a thorough airing. If clothes are brushed thoroughly once a week, there is no fear that they will become a prey to moth. If it is necessary to pack clothes up for a lengthy period, either in a wardrobe or a trunk or other receptacle, there is nothing more suitable as a wrapper than a newspaper, the smell of which is particularly obnoxious to the moths that infest clothes.

Cloth is highly susceptible to the effects of heat and damp. When a man has worn a suit of clothes all day, and particularly if covered by an overcoat, it cannot fail to be somewhat creased, especially in the arms of the coat and the legs of the trousers. If these garments are carelessly thrown on a chair, they will assume permanent wrinkles instead of temporary ones. The chief damage is done during the first few hours after removal, so it should be a rule always to place the coat on a suit-hanger with a lower rail over which to place the trousers neatly folded. A trouser-press is a help, as by its aid trousers can be kept in good condition and their life prolonged.

When clothes become soiled they should be sent to a good cleaner, who will tailor-press them before sending them home.

Renovations by the Tailor

Early attention should be paid to any sign of wear at vulnerable points, e.g. bottoms of trousers and cuffs of sleeves. If the damage is severe, take the garment at once to a tailor, who will present a new wearing surface by shortening the sleeve or trouser leg by a fraction of an inch.

Hats should be kept well brushed. Nothing is so damaging to them as dust, which eats its way into the felt, and speedily renders the hat too shabby to wear.

Neckties need careful treatment. Silk is a material which gives the greatest resistance to creasing, but silk ties are not composed entirely of that fabric. There is an interlining of swansdown, horsehair, wool, canvas, or some other material, and this interlining either becomes displaced or distorted through being re-tied day after day in exactly the same position. The only remedy is to have several ties in use, and to wear them in succession, placing them for a rest in a tie press or smoothing them out as much as possible after a period of wear.

Underwear should be changed frequently for airing, but not necessarily washed so frequently. These remarks may also be applied to socks and stockings—and it may perhaps be added that keeping the toe nails cut short prevents frequent darning. The practice of carrying loose change in the trouser pocket, or a heavy bunch of keys, speedily wears a hole in the under-garment. The stuffing of all sorts of articles in the pockets of the outer garments should also be avoided, as nothing contributes more to loss of shape. Boots and shoes, immediately they are taken off, should be put on boot trees. Here also the rule of having more than one pair in wear is highly to be commended. Where the heels have a tendency to wear on one side more than the other, the addition of a rubber tip will be effective. If a man follows the policy of constantly changing all the articles he wears, of keeping his garments well brushed, and of placing them in the best position after wear to recover the shape, he should save many pounds a year, and present a better appearance.

Hints for Women. Obviously the chief thing is to keep all your clothes well pressed and spotlessly clean. Damp, dust and moth (q.v.) are the greatest enemies to woollens and tweeds, and you should never put clothes away for any length of time without giving them a thorough airing. If you brush them well once a week there is no danger of moth.

As far as cleanliness is concerned, the main essentials are to keep all "undies" and washable silks and cottons frequently washed, and to send all tweeds and shrinkable silks to be regularly cleaned. To keep knitted woollens soft and in perfect condition never wash them in very hot water or dry them too quickly, as it hardens them. Ammonia added to the water will loosen dirt and grease.

To keep your undies fresh and fragrant keep them in Cellophane envelopes and add lavender bags to give a faint perfume.

Stockings are a great problem, as they always seem to wear out so quickly. However, here are a few useful tips which will help to prolong their life: When they are

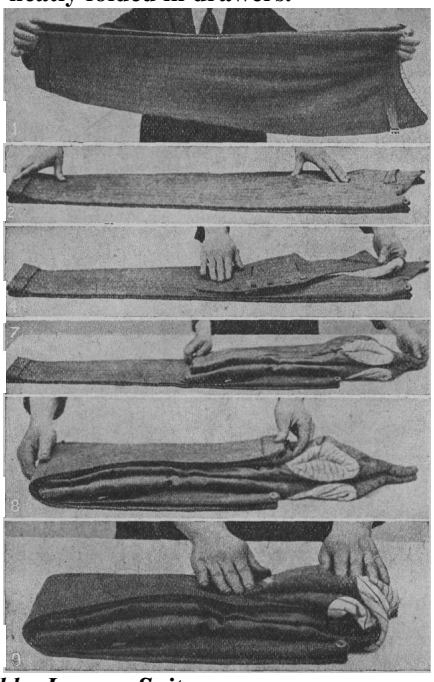
new, always rinse them through in soapy water before wearing them; it greatly enhances their elasticity. A spoonful of vinegar added to the water takes away any ugly shine. Never wring them out, but roll them up in a towel to take away surplus moisture; then hang out to dry. Wringing them weakens the threads.

To keep white things a really good colour when they are washed always add either a little spirits of wine or some blue to the last rinse.

Always use a deodorant or sew dress preservers into frocks as perspiration leaves a very ugly stain. If any frocks do get stained you can remove the stain by covering the affected part with powdered borax, placing it over a saucer and pouring hot water through.

A really useful tip for keeping the backs of skirts in good shape is to sew a strip of silk, about half a yard long and cut to the shape of the skirt, into the side seams at the back.

All clothing should be periodically overhauled and mended whenever necessary. Keep all your clothes on hangers or neatly folded in drawers.



How to Fold a Lounge Suit.
1. Fold trousers, button to button at top and seam to seam in leg.
2. Place flat on table.
3. Fold vest, with lining inside and fronts outside.
4. Place vest on top of trousers.
5. Fold jacket, pushing out tops of sleeves.
6. Place on table, with sleeves straight, and fold over until lapels almost meet.
7. Fold again so that fronts meet and are straight, then place on vest.
8. Fold trousers over as far as possible, to prevent crease in legs.
9. Turn top of coat over as far as bottom of trousers will allow. (Courtesy of My Valet, Ltd.)

Small Renovations. **In spite of proper care wear and tear are bound to have their effect eventually, and there comes a time when some form of renovation is necessary. Coats grow shiny; collars begin to look greasy and stained, and garments require pressing.**

To remove shine from a black coat rub the latter gently with some fine sandpaper, afterwards sponging it with a solution of common washing blue and water. Press the coat while it is still damp, but if it requires freshening, first brush it and clean it with benzine, afterwards sponging it with a quart of water containing a table-spoonful of ammonia. Coat collars are best renovated with a mixture comprising 1 pint benzine, ½ drain chloroform, and 1 dram alcohol. Apply this with a soft rag, or, as an alternative, rub the collar with a cloth dipped in ammonia.

A common thing which ruins the look of a pair of trousers is bagginess at the knees. This is caused, to a large extent, by sitting, and ordinary pressing will not remove it. It is possible to remedy it in the following simple manner.



Place the trousers flat on a table (in the same way as indicated in Fig. 2 of illustrations of how to fold a lounge suit) and damp the knees slightly with a moist cloth. Then place the left hand firmly just above the knee so as to hold it in position, and with the right hand take hold of the back of the trouser leg, about midway between the knee and the bottom of the leg, and pull hard towards the bottom. Transfer the right hand to a similar grip in the front of the leg, and again pull downward. It will be found that this entirely removes the bagginess from the knee. Each trouser leg should be treated separately. The trousers can then be pressed in the usual way, if desired.

Never use a light-coloured cloth in pressing dark

clothes, since the white lint invariably leaves an impression which is difficult to remove. Do not rub, as in ironing, but lay the iron on gently and move it slowly over the garment. When clothing has become mildewed, put the affected part in a bowl of buttermilk and it will come out like new. In the case of a fabric on which there are acid stains, it is best to apply ammonia. If this is done without delay the effect of the acid will be neutralised, the material prevented from rotting, and the colour saved.

Clothes which are made of light materials can be cleaned with a cloth ball (q-v.). Perspiration stains should be treated as early as possible by soaking the affected part in cold water for 15 min., then sprinkling it with lemon juice and leaving it for a few minutes before rinsing it in clean water. If the first treatment is not successful, repeat the process, taking care not to leave the lemon juice on too long, as this might affect the dye in coloured materials.

CLOTHES BRUSH. In the best sorts the fine, springy quality of the bristle is easily noticeable. In a common brush the bristle will either be soft or cut short to produce greater stiffness. If preferred, a brush can be obtained with the end portion of the back set with short, stiff knots of bristle which are useful in removing hard deposits of mud.

In a hat brush stiffness is not so essential. A clothes brush and a hat brush of the square-back shape, with screw eyes to hang on a polished board, make a hall set, and are less obtrusive than the more elaborate ones with bevelled mirror, besides the fact that fibre, which is extensively used with bristle in making common clothes brushes, is often found to be a component part of such hall sets. Fibre is detrimental to good cloth, and the knots of this mixture are usually punched into the holes; this can be detected by the absence of a separate glued and screwed veneer back. The fibre mixture will not last in wear; the bristle is poor, the fibre soon wears off, and the polish on the back quickly dulls, so that this brush is soon rendered almost useless.

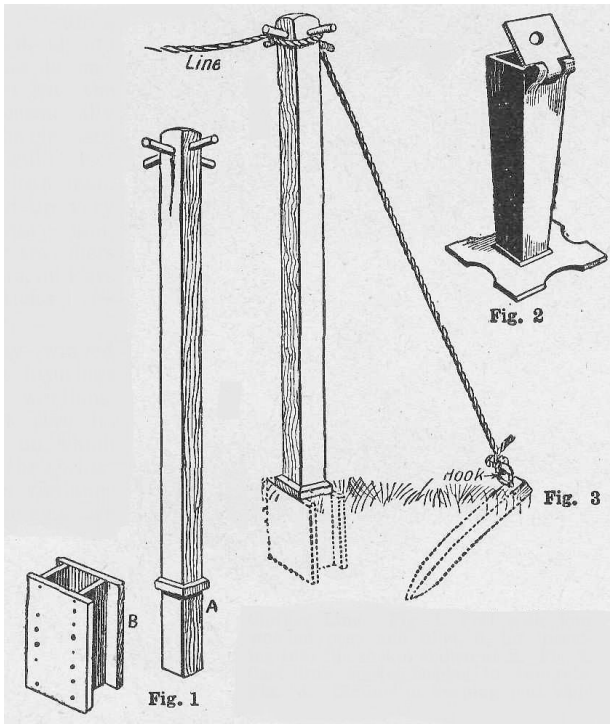
A good brush should have stiff bristle of fair length, a well-filled stock and a separate back. The back should be secured by brass screws and finished by polishing. *See* Brush.

CLOTHES HORSE. A clothes horse is usually made with two folds of equal size, but sometimes with three or four, the latter being cumbersome to handle. A more compact form is to make it in three folds, the centre one wide and each of the wing folds half the width of the centre fold, so that the whole closes flat into two widths only. The uprights should finish 1½ in. by 1⅛ in. each, to be mortised right through for the spaced rails to enter. These can be tenoned to enter right through and be double wedged. When fitted up they can be well sandpapered and left with the natural surface, the rails being slightly rounded on top edges. The folds are hinged together with strong webbing, with two hinges above and two below to each pair of meeting uprights.

The dimensions may vary according to requirements. A size of 3 ft. 6 in. high may be 2 ft. 9 in. wide, each fold being, therefore, 16½ in. A 4 ft. size can be 3 ft. wide when closed, and a 4 ft. 6 in. size 3 ft. 4 in. wide, all with three rails to the fold. Larger sizes of the article may have four or more rails. *See.* Airer.

CLOTHES LINE. When clothes are hung up to dry they are suspended from lines which may be made of hemp, jute, or galvanised iron stranded wire. The hemp lines are generally putup in 18 to 20 yd. lengths with a ring at each end. Galvanised wire lines are made in two thicknesses, the No. 11 gauge and a much stouter line, known as No. 8 gauge, and generally in 50 or 100 ft. coils.

The lines are supported by wooden posts 2½ to 3 in. square and 8 ft. long. The upper end has wooden pegs for attaching the lines on all four faces; the lower end has a fillet A to support the post as it rests in the wooden socket B (Fig. 1.). The latter should be tarred and buried in the ground, preferably in a lump of concrete built round it as a foundation. With this arrangement the posts can readily be lifted out of the sockets and stored away when not in use.



Clothes Line. Fig. 1. Post with four wooden pegs and fillet, A, for inserting into the socket shown at B. Fig. 2. Cast iron socket bedded in concrete. Fig. 3. Method of keeping post-rigid.

The socket shown in Fig. 2 is made of cast iron: it is sunk into the ground and bedded in concrete. The posts used for this socket should have tapered ends to fit tightly into the hole in the socket. However carefully the sockets are fixed, the post is seldom rigid; it is a good plan to provide a hook low down on

an adjacent wall, or screwed into a wooden post driven into the ground, and to attach one end of the line to this hook, then twisting it around the post. The line thus acts as a guy or stay and keeps the post rigid. *(See* Fig. 3.)

When a wall or the side of the house is available it is best to fix a hook or an eye-bolt securely into the brickwork and to provide a pulley for the line. A clothes line should always be brought indoors when not in use. It is unsightly, and exposure to wet rots the rope. Frequently in towns, and occasionally even in the country, the line should be cleansed in hot soda and water, otherwise it will collect smuts and leave dirty marks on the clean linen. Fine, light clothes lines, which fold up very small and are easily set up in an ordinary room, with small pegs to suit, are sold for travellers and women who live in bachelor flats, and are a help in the laundering of light articles. *See* Airer; Cord.

CLOTHES MOTH. This tiny winged insect of the moth family is most injurious to clothes, particularly furs and woollens. Before dying in early autumn it lays its minute flat eggs in such materials, on which the larvae feed when they emerge in the spring. The chief times for the housewife's vigilance are August and September, when the eggs are laid, and the spring, when they hatch. The spring and autumn household cleanings, with their attendant turning out of every drawer and cupboard, protect against moth as well as clearing away dirt and lumber. There is little risk of moths attacking clothes which are in constant use. The things that need watching are woollen cloths, curtains, blankets, eiderdowns, and furs which, not being in use, are stored away during the summer months.

Preventives and Remedies. The contents of all drawers and wardrobes should be turned out periodically, and every item examined for moth marks. All should be well shaken in the open air, and if possible hung out of doors for a few hours. Furs should be hung over the line and well beaten with a light cane before being packed away.

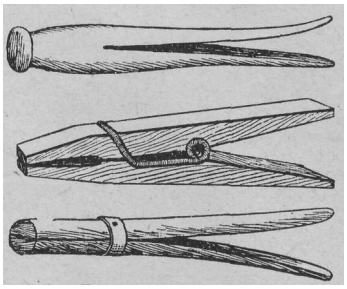
Pockets in overcoats and winter wraps not in use should be turned inside out and brushed free from fluff, and then filled with small broken pieces of a cigar box or cedar chips; moths object to the smell of cedar. Clothing stored in newspapers, linen and other materials with a cold surface is seldom harmed, since moths avoid all substances of a chilly nature, because they are unfit for hatching. The only precaution needed is that the edges of the paper must be pasted together, and the linen sewn so that no moth can enter.

Apart from their dislike of cold substances, moths have a distinct aversion to certain odours, such as tobacco, Russian leather, and sandal-wood. Two other odours which keep away moths are those of naphtha and lavender, and both should be freely used among stored things. Naphtha balls can be bought by the pound and placed one or two in drawer corners and in the folds of blankets, etc. They are, however, not fully effective and a far more up-to-date and efficacious remedy is dichlorbenzene, obtainable in crystals from any chemist at about 9d. per half-pound.

When it is suspected that moths are in an article of clothing that will lend itself to steam treatment, wrap it in a clean damp towel, put it in the oven with the gas turned low, and steam out the grubs. If the garment is too large for the oven, place it under a damp towel, and press it with a rather hot iron.

When moths have actually been detected in furs or clothes, brush the latter with a whisk broom saturated with formaldehyde solution. Trunks should also be treated with this solution, and afterwards left in the fresh air for a few hours. A good substitute for formaldehyde consists of 3 tablespoonfuls of turpentine added to 3 quarts of cold water. This may also be used for rubbing on floors under carpets and rugs which have been attacked by moths.

CLOTHES PEG. Probably the best is the American, turned from a piece of beech or other hardwood, and the V-shaped slot or jaws, formed by sawing away the material to the shape substantially as shown in the illustration. They are readily produced from dowel-rod, turned to shape with chisel and gouge. A two-part block, hollowed in the centre to receive the peg, is used to support it in a vice while sawing out the slot.



Clothes Peg. Types in common use : top American; centre, spring-grip; bottom, gipsy

Another type of clothes peg, known as the gipsy, is made from odd bits of wood whittled with a knife and the two pieces secured with a narrow band of tin-plate. The patent pegs furnished with spring grip are small in size but scarcely so durable as the American type; they are more suited for indoor use. Clothes pegs should hold tightly, and never get rusty, or otherwise they are liable to damage the clothes. On this score the American type is undoubtedly superior, as there is no metal to rust, no joints to give way, and the long tapering slot, together with the natural springiness of the material, gives it a secure and powerful grip.

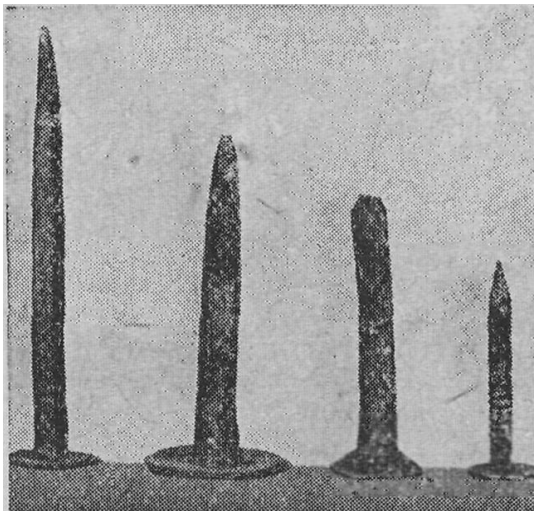
CLOTTED CREAM. In the preparation of clotted cream it is desirable to use rich milk, but this is not essential. Whole milk, warm from the cow, is strained into setting pans. The pans most suitable for the purpose hold about 6 to 8 quarts of milk, and measure 15 in. across the top, 7 in. in depth, and 11 in. across the bottom, being somewhat deeper than the usual. The pans of milk are left undisturbed in a cool dairy for the cream to rise. In summer 12 hours or less

is the time allowed, but in winter 24 hours is usual.

Scalding is then carried out by placing the pans on a hot-water stove, and allowing steam to play under them until they have attained a temperature of 175° to 185° F. in not less than 20 min., when they are removed, and allowed to cool naturally in a cellar or other cold position. The scalding should not be done too quickly, or the cream is rendered greasy. The heating may be carried out by placing the pans on a kitchen range or hob, but the hot-water method is preferable.

When the scalded milk and cream are cold— in warm weather the cooling should be done quickly—the cream may be taken off in a thick clotted condition, and is ready for use. The cream is generally sold by the lb., and 1 lb of cream may be obtained from 1½ gal. or less of Jersey milk; nearly 2 gal. of Shorthorn milk may be required to produce the same quantity. *See* Cream; Milk.

CLOUD GRASS. The popular name of cloud grass is given to a hardy annual group of grasses called Agrostis, which are very useful, when dried, for the purpose of room decoration.



Clout or Broad-headed Nail. Left to right, fine wrought; strong wrought; counter-sunk; blue-wire.

CLOUT NAIL. Having a broad head, relatively large in diameter to the shank, the clout nail is useful for fixing such material as zinc sheets, roofing felt, or for any purpose where the material to be fastened is comparatively thin or fragile. Various patterns are illustrated. Blue-wire clout nails are made from ½ in. to 1½ in. long; wrought clout nails, fine (that is, thin) or strong (stout), are from ½ in. to 1 ½ in. in length. *See* Nail.

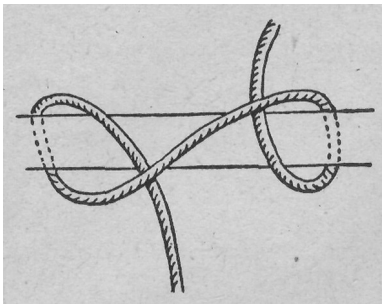
CLOVE. The dried buds of an Eastern plant are widely used both in medicine and in cookery under the name of cloves. Their most valuable constituent is oil of cloves, of which the dose given by doctors varies from ½ to 3 minims. Applied outwardly it has a stimulant effect on the skin, producing heat and redness. When applied to a cavity in a decayed tooth it often relieves the pain of toothache.

Taken internally, oil of cloves causes an increased flow of saliva in the mouth. In the stomach the normal movements are stimulated, and there is an increased flow of gastric juice. Oil of cloves increases the appetite and improves the digestion; it is often prescribed in cases of indigestion with flatulency.

For culinary purposes cloves form a valuable spice, sold whole or in powder form; they have a strong aromatic odour, and a hot, spice-like flavour. A clove should not float horizontally when placed in water: if it does it shows that the essential oil has been extracted.

Two or three cloves added to apple while it is stewing or put into an apple pie will improve the flavour. Tincture of cloves is used for flavouring mulled wine. It can be prepared at home by dissolving ½ oz. fresh oil of cloves in ½ pint rectified spirits of wine.

CLOVE HITCH. This is a simple method of attaching a rope to an object without the use of a knot. The illustration shows how the fastening is made, the two turns being brought close together after they are formed. The security of this hitch depends largely on the fact that the rope bends over itself.



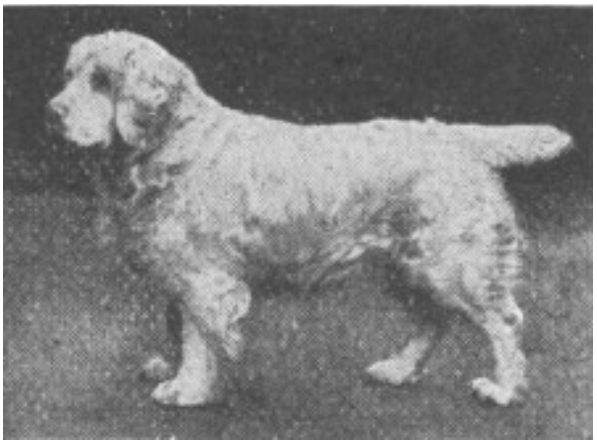
Clove Hitch. Diagram illustrating turns of rope round a beam.

CLOVER. The name is applied to various grasses belonging to the genus trifolium, of which the red clover, cow grass, zig-zag clover, and woodland clover are the best sorts for pasturage. The different clover grasses are sometimes included in the mixture of seed for lawns, but not for turfy stretches for the purposes of tennis, croquet, or bowls. The shamrock is commonly said to be one of the clovers, trifolium minus.

CLUB FOOT. Paralysis and the contraction of scar tissue after an injury are the commonest causes of club foot, which is a permanent malformation of the foot or ankle. The deformity may be present at birth or it may be the result of accident or disease, and there are four varieties. In the first of these, Talipes equinus, the heel does not reach to the ground, the patient's weight falling on the ball of the foot. The opposite condition is found in the second kind, Talipes calcaneus, the heel alone touching the ground, while the toes and the front part of the foot are lifted up. In Talipes valgus and Talipes varus the outer and inner sides respectively of the foot are turned upwards so that the patient walks on the inner or outer side. *See Foot.*

CLUB ROOT. In cabbages and other greens this is a most troublesome disease. It causes great loss and infects the soil, attacks the roots and causes the plants to rot. It attacks other members of the same family (eruciferae), e.g. turnip, wallflower, charlock and the shepherd's purse weed. The best treatment is to lime the land heavily and not to grow susceptible crops on infested land for three years. Anbury and finger and toe are other names for this disease.

CLUMBER SPANIEL. Both in disposition and appearance the Clumber differs materially from the rest of the spaniel family. He is heavily built, weighing from 60 to 75 lb., slow but an excellent game-finder; not being headstrong, he is easily broken. His white coat is relieved with lemon markings, and his square, massive head and deep flews give him a dignified look. The stout legs are, of course, short, and his back is powerful. The breed originated at Clumber House, near Worksop, Nottinghamshire, the seat of the dukes of Newcastle. *See* Dog.



Clumber Spaniel. "Sandringham Spark" owned by King George V.

CLUMPS. For a large party of people clumps is a good game, but it should not be attempted with fewer than 10. The players divide into two parties, which occupy opposite ends of the room. Each camp chooses a representative from the other, and the two representatives go out of the room together and decide upon some object—no matter how obscure—which is to be guessed by the others. They might, for example, choose the largest diamond found in the Kimberley mines in a given year. On their return each representative goes to the hostile camp; the one chosen from camp A goes to camp B and vice versa.

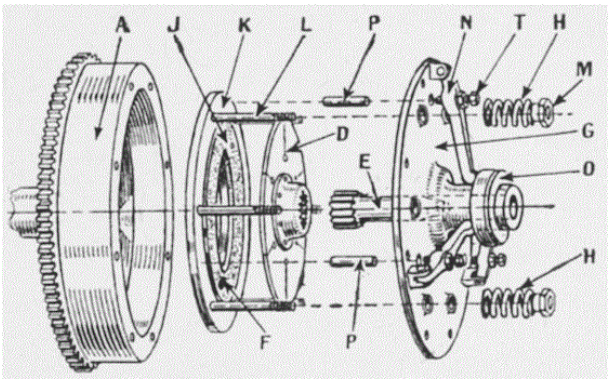
It is then the business of the respective camps to find out by close questioning what object has been chosen. To these questions only "Yes" or "No" may be given as answers. The camp which first arrives at the correct solution wins the round and retains the representative, as well as its own member, who returns from the losing camp. *See* Children's Party; Evening Party.

THE CLUTCH ON MOTOR VEHICLES
Its Working Principles Described and Illustrated

This is one of the articles in this work that deal with the mechanism of motor vehicles, others including Brake and Gear. See also Motor Car; Motor Cycle

The clutch is employed as a friction-gripping device by which the engine is enabled gradually to take up the drive through the gear box to the back axle. It is necessary to disengage the engine from the transmission before making any change of gear; as well to enable a vehicle to come to rest without having to stop the engine; also to allow the engine to run before the vehicle gets under way.

The importance of the part played by the clutch and the need of keeping it in good order cannot be overestimated. Should the clutch get dirty and stick up, it will be impossible to engage the low gear without considerable noise and consequent damage to the gear teeth when starting away from rest. The clutch may fail to engage properly, or it may suddenly take up the drive, thereby throwing severe strains upon the transmission. As a result, gear wheels may be stripped, or the differential gear seriously damaged.

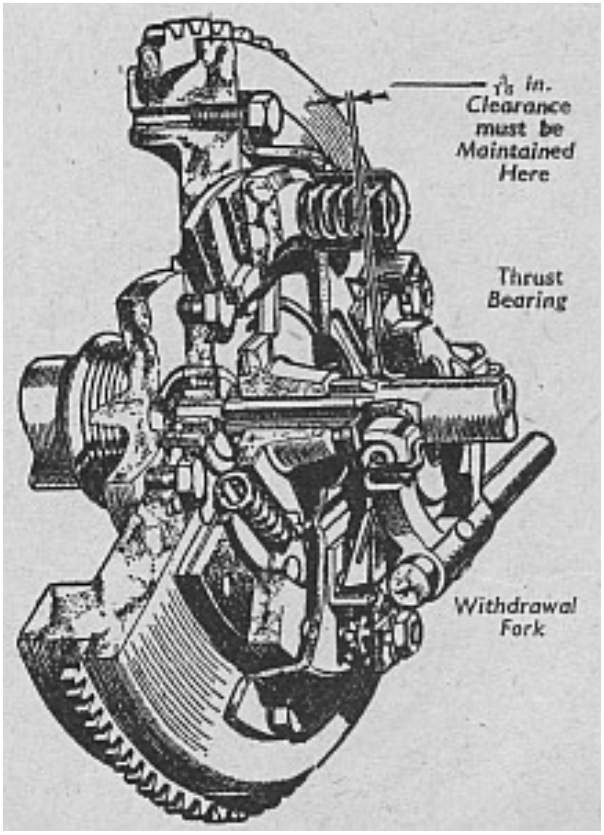


Clutch. Fig. 1. Principal parts of a single-plate disk clutch. The outer plate (6) is bolted to the flywheel (A) and carries the driving member (D) which is located on the splined shaft (E). Coil springs (H) press the plates and friction disk together and the pressure is relieved by the action of the thrust race (0) and lever arms (N).

Single-plate Clutch. This clutch, which has taken the place of the cone type, is the one in most common use to-day. Less expensive in first cost, it causes little trouble in upkeep, and has the great advantage that its speed quickly falls when disconnected. The principal parts are shown extended in Fig. 1. The plate G, which is bolted to the flywheel rim A, carries all the clutch elements. The parts are thus enclosed in but do not touch the flywheel recess. The driving member is a plate D, having a number of radial saw cuts which afford flexibility; the splined centre engages the end of the clutch shaft, E, on which it may slide slightly endwise. The plate D is held between a fabric disk, J, riveted to the pressure plate, K, and a similar disk on the plate G (not shown).

Studs, L, screwed into the pressure plate project through holes in the fixed plate, G, and pressure is applied by means of springs, H, fitted on the studs outside plate G and held fast by the nuts M, which

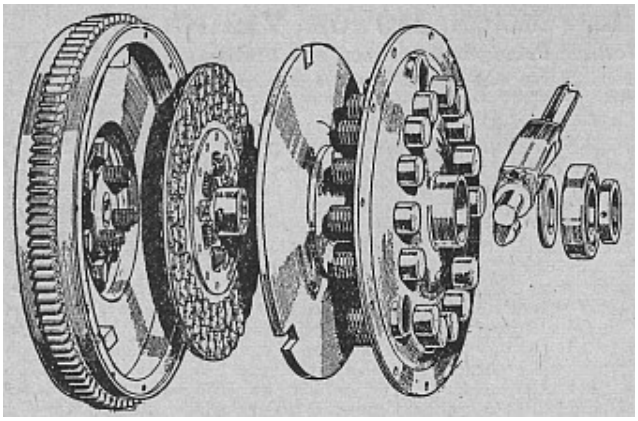
permit of adjustment. The parts are normally held together by the springs. When the clutch pedal is depressed the inner ends of the three levers, N, are forced towards the flywheel by means of the ball thrust race, O, the rear end of which is engaged by the clutch fork. The adjustable screws T, in the outer ends of the levers N, engage the pins P, and thus force the pressure plate away from the fixed plate, leaving the driven member, D, free.



Clutch. Fig. 2. Typical dry single-plate clutch shown in part section. The driven plate is fitted with a cushion hub and the thrust bearing comprises a solid graphite ring (Courtesy of Morris Motors, Ltd.)

Another typical single-plate clutch is illustrated in Fig. 2. As in the pattern previously described, this clutch has a driven plate which is faced in each side with friction material, and it is held between the face of the flywheel and a pressure plate by a series of coil springs. These are located in bosses formed on an outer casing and are compressed by the action of lever arms and a lever plate which are moved forward when the clutch pedal is depressed. Special features of this clutch are the solid graphite block thrust bearing and the cushion hub. The former is located in the withdrawal fork anchored to the cross shaft, and since it requires no lubrication the difficulty frequently experienced with the ball bearing type of race in maintaining an adequate supply of grease or oil is overcome.

The cushion hub referred to is a device incorporated to provide smooth running at low speeds and to lessen snatch in the event of the clutch being roughly engaged. The damping effect is achieved by interposing coil springs between the boss of the hub and the driven plate. As in other types of clutch the chief point of maintenance is the retention of the requisite amount of clearance between the thrust bearing and the lever plate.



Clutch. Fig 3. Main components of cork-insert plate clutch in extended view. The friction plate with double row of cork disks is disposed between the flywheel face and the pressure plate. A series of helical springs press the various elements together. Withdrawal fork and ball race are also shown. (Courtesy of Morris Motors, Ltd.)

In some types of plate clutch fitted to cars cork inserts take the place of the fabric linings. This form of clutch runs in oil and as a general rule the lubricant is fed to the mechanism by means of a duct connecting the bell housing of the flywheel with the crankcase. The component parts of a cork insert plate clutch are shown in Fig. 3. It will be noted that the driven plate has a double line of inserts and has a cushion hub. The driving surfaces consist of the forward face of the pressure plate, shown immediately to the right of the driven plate, and the rear face of the flywheel seen on the extreme left. Pressure is exerted by helical springs on the cover plate bearing against the pressure plate, and the withdrawal mechanism consists of a fork, and thrust race which moves the plate away from the flywheel when the pedal is depressed, so compressing the springs and relieving the pressure on the cork inserts.

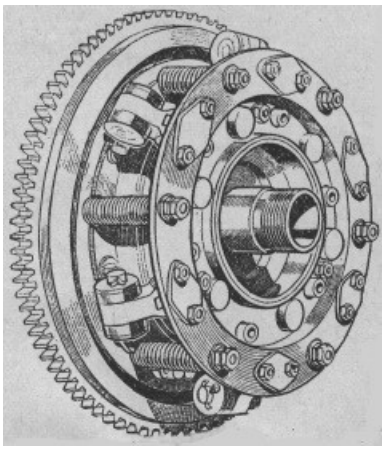
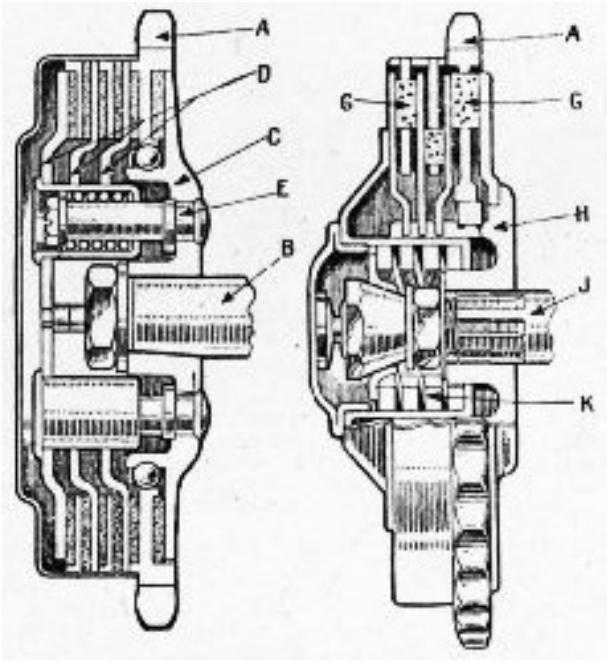


Fig. 4. Newton automatic clutch in which engagement and withdrawal are controlled by engine speed and effected by an arrangement of links and weights working on the centrifugal governor principle. (Courtesy of "The Autocar")

Automatic Clutch. In order to simplify the control of the modern car various designs have been evolved whereby the clutch is withdrawn and engaged

automatically. The essential principle of the automatic clutch is that it works in sympathy with the engine throttle opening and is not directly actuated by the driver. The systems in general use employ either the partial vacuum in the induction system of the engine or centrifugal force. In the former design an arrangement of servo cylinder and piston is utilized with connexions with the inlet manifold, the accelerator and clutch pedal. When the engine is idling a partial vacuum occurs in the servo cylinder which moves the piston and withdraws the clutch. On the accelerator pedal being depressed, however, the partial vacuum is destroyed and the piston moves in the opposite direction so engaging the clutch. The centrifugal type of clutch is represented by the Newton clutch (Fig. 4). It works on the same principle as the centrifugal governor and consists of three main parts, the driving member, driven member and friction plates. The driving member is bolted to the flywheel and comprises an outer casing on the circumference of which are fitted links with weights attached at their central hinges. These links are connected to a movable plate which bears against a number of coil springs. When the engine is running at low speeds these springs hold the plate so that it does not press on the clutch plates and therefore no drive is transmitted. When the engine speed increases above 500 r.p.m., however, centrifugal force acts on the weights and throws them outwards. This draws the arms of the links towards each other and moves the plate inwards so that the friction plates are pressed together and the clutch is thus engaged.

Although this type of clutch is automatic a pedal control is incorporated so that it can be actuated at any engine speed for the purposes of a gear changing.



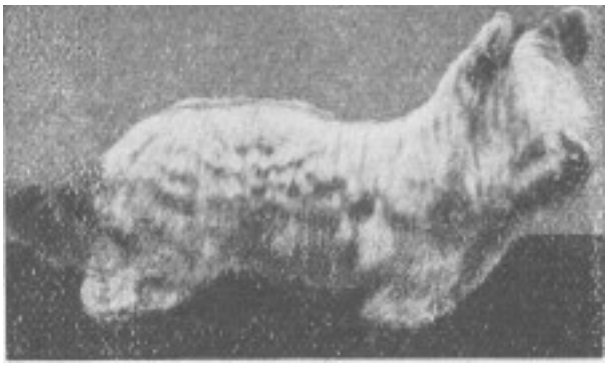
Clutch. Two examples of clutches used on motor cycles. Fig. 5. Sturmey-Archer countershaft clutch. Fig. 6 (right). Type with cork inserts in the driving disks.

Motor Cycle Clutches.

The clutch on a motor cycle is usually combined with the chain sprocket wheel driven by a chain from the engine, and also with the sprocket pinion, which is connected to the road wheel. In the multiple disk Sturmey-Archer countershaft clutch (Fig. 5), the chain wheel, A, geared to the engine drives the first motion shaft, B, of the gear box through a pack of driving and driven disks with interposed fibre rings; the main driven member, C, which is keyed to the end of the shaft, B, carries the three driven disks, D; several coil springs supported on pins, E, clamp the disks between the driven member, C, and the outer driven disk, D.

Another type (Fig. 6) employs cork inserts (G) in the driving disks, which rotate with the chain wheel, A. The driven disks rotate with a driven member, H, having a splined connexion with the shaft, J. The coil spring, K, forces the disks into engagement.

CLYDESDALE TERRIER. Of the several breeds of Scottish terriers the smallest is the Clydesdale. Its coat is long, fine and silky, with a high gloss, and there is no undercoat. A parting runs along the middle of the back and head, and from this the coat falls in two perfectly straight and even curtains to the ground, hiding the short legs and the dark, sharp eyes. The small ears stand erect almost on the top of the head, their long fringes covering the sides of the head. The general colour is an unmixed bright steel blue; but head, legs, and paws are a clear golden tan, and the tail is dark blue or black. The weight is about 18 lb. This somewhat rare breed is now seldom exhibited. *See* Dog; Terrier.



Clydesdale. Specimen of the small Scottish terrier.

COACHMAN. A coachman is a man who drives horses for an employer, the word being usually restricted to one engaged by a private employer. Being a male servant, his employer must take out a licence for him; this costs in Great Britain 15s. a year. *See* Chauffeur: Driving; Horse; Insurance.

COAGULATION. The change from a fluid to a more or less solid state, as seen in the clotting of blood, the curdling of milk, and the hardening of white of egg by heat, is termed coagulation. Blood coagulates when it is shed, and when it is received in a vessel the following sequence of events is easily observed. The

process begins on the surface of the blood, which in about 2 or 3 minutes begins to stiffen and become jelly-like. This takes place throughout all the blood, and is complete in from 10 to 15 minutes. Then a pale straw-coloured fluid oozes out from the clot, until in an hour or two the clot, which has become smaller and harder, is floating in the fluid.

Clotting is due to the formation of a substance known as fibrin ferment by the injured cells and the leucocytes. In the presence of salts of lime this ferment throws the solid substance of the clot out of solution. If blood when it comes from an opened blood vessel did not undergo this change, which plugs the opening, we should be in danger of bleeding to death from the slightest wound, as is the case in haemophilia where the process is delayed beyond the normal time.

In addition to haemophilia the blood is long in clotting in haemorrhagic purpura, pernicious, anaemia and jaundice. In these conditions slight bruises may produce considerable bleeding under the skin, and bleeding occurs in alarming quantity from wounds or mucous membranes. *See* Clot; Milk.

COAL. Coal is made up of a combustible portion, which is chiefly carbon, and an incombustible portion, which is mineral matter and constitutes the ash. Of all kinds of coal the richest in carbon is anthracite, which contains 90 per cent. Harder and heavier than ordinary coal, it burns with practically no flame or smoke, giving out an intense heat and leaving little ash. It is not very suitable for ordinary grates and should be burnt in specially constructed stoves. An anthracite stove is very useful in a hall or library, and once it is started it needs practically no attention beyond being replenished every 12 hours or so.

Soft or bituminous coal is sold under such names as Wallsend, silkstone, selected, Derby or Nottingham brights, household and kitchen. A coal that gives excellent results in the kitchen range may not be good on the other hand for the drawing room, and on that account two varieties of coal may be used in larger homes.

Cobbles and nuts are intended mainly for kitchen use. The terms refer to size rather than to quality, cobbles representing pieces between 6 in. and 4 in. and nuts between 4 in. and 2 in. If a separate coal-fired boiler is used in connexion with a central heating installation, hard steam coal is to be preferred to a soft one.

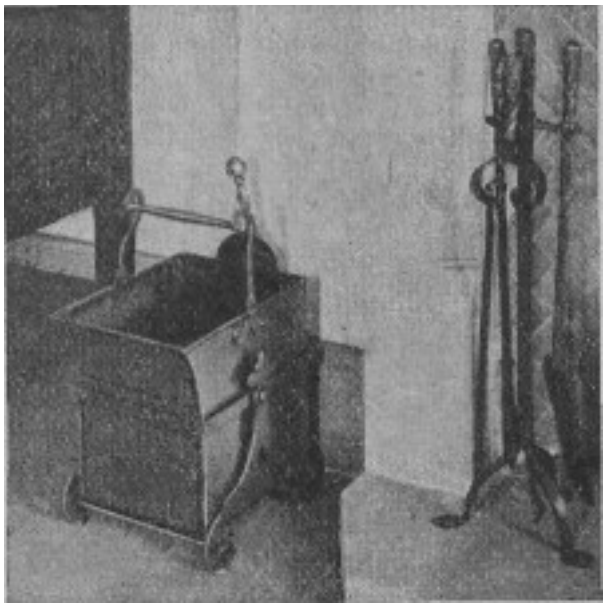
Dross or coal dust is a bugbear to the householder, and every effort should be made to prevent its accumulation in the cellar. When a big lump of coal has to be broken it should be placed on the floor of the coal cellar and not allowed to rest upon the other coal; in this way a clean break can be made.

When a fresh supply is got in it should not be dumped on top of any small coal and dust remaining. This should be scraped to one side, and it should be a rule to use some of it every day along with the larger lumps. A good fire can often be kept burning for a long time without attention if banked up with small stuff.

The dust can also be formed into solid blocks or briquettes with the aid of a little Portland cement and water, a vessel such as a flower-pot being used as a mould. The briquettes and ovoids (egg-shaped cakes) obtainable at the shops are made of small coal compressed with pitch as a binding material. *See* Anthracite; Cooker; Range.

COAL BOX. For a drawing room the helmet-shaped box in brass, or a circular box of pierced steel or brass—the selection of metal being dependent on the other accessories of the hearth—with an iron lining and supported on feet, is always suitable. The latter with a lid is often vase-shaped in the Adam style of decoration, but is also seen in rather a heavier type of box without a lid. The iron cauldron and the wooden tub, strengthened with bands of copper and a separate lining, both look well with a brick hearth. Wooden boxes of the old-fashioned type with hinged and sloping lids are best in plain designs. Square-topped coal cabinets with drop fronts and removable liners, which tilt forward when the front is opened, are sometimes liked, as the top forms a convenient small table surface.

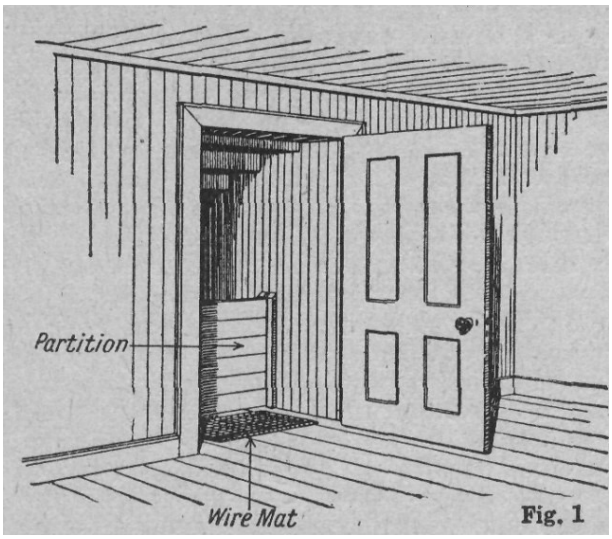
For a dignified fireplace, or with an oak-panelled chimney piece, nothing could be more suitable than the metal box illustrated. *See* Chimney.



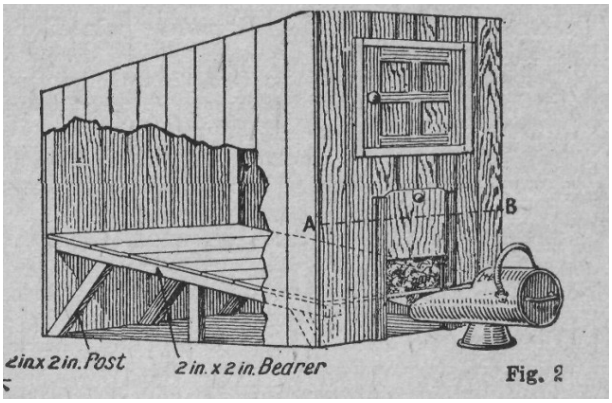
Coal Box. An attractive and useful example which can be tilted forward when used. (Courtesy of Waring and Gillow, Ltd.)

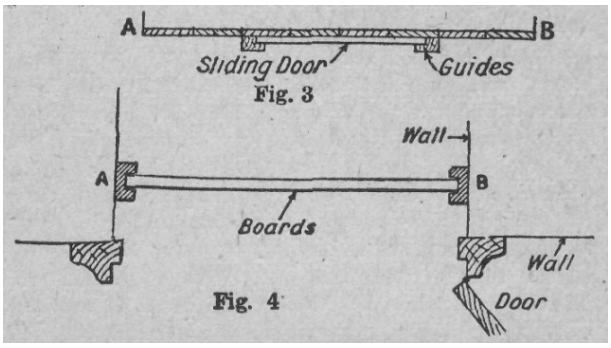
COALBROOKDALE. Old china bearing this name was produced at the Shropshire village of Coalport in Coalbrookdale. Those pieces which are marked CD, CBD, CDale, or the full word, are called Coalbrookdale, to distinguish them from those bearing the later Coalport marks. One of the characteristics of the dalesmen potters was to produce careful copies of Sèvres, Chelsea and other wares. These were either unstamped or bore copied marks; when such pieces are traced to their real makers, they rank as Coalbrookdale. *See* China; Coalport.

COAL BUNKER. In flats and small houses a coal bunker is frequently built into some odd corner. It must be made strong enough to withstand the frequent introduction and removal of the coal. For this purpose boards are fitted into grooves or a channel at the front of the bunker (A, B, .Fig. 4). These are removed one by one as the coal is consumed.



Coal Bunker. Figs. 1-4. Diagrams showing two methods of arranging a small bunker so that the coal shall be easily accessible.



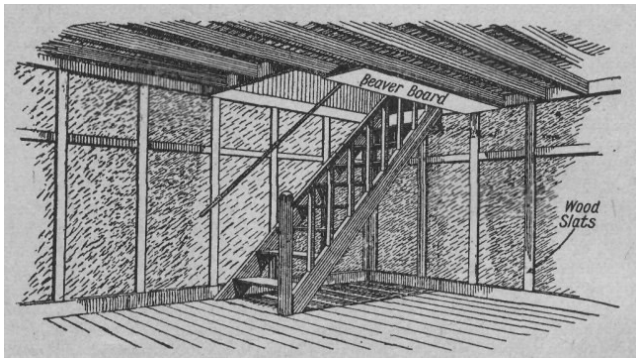


In modern flats where the coal cellar is often simply a cupboard beneath the stairs, it is the cause of much grit and dirt getting scattered about. This can be remedied to some extent by building a rough partition with stout boards about a foot away from the door, as in Fig. 1. In front of this place a wire grid or woven wire mat, so that when handling the coal most of the dust will fall on to this grid, pass through it, and be kept from littering the house.

Where circumstances permit, a good plan is to construct a hopper, as illustrated in Fig. 2, provided with an exterior door sliding in strong grooves, shown in section, Fig. 3.

The upper part of the front of the bunker may be provided with a hinged flap or with removable boards having runners similar to those at the bottom. This provides for the introduction of the coal, which can be withdrawn by opening the door at the bottom and allowing the coal to fall out directly into the coal scuttle. A stout poker will be found convenient for raking the coal should it show any tendency to jam in the hole.

COAL CELLAR. A coal cellar in small houses is often an excavation beneath the floor, approached by a flight of steps; the coal is delivered through a shoot covered by a circular iron plate, protected against intruders by a chain or bar. Such cellars are liable to be flooded during heavy rain or by the overflowing of a gully or drain. This can be dealt with by raising the height of the curb and providing more suitable channels for the overflow water to drain away.



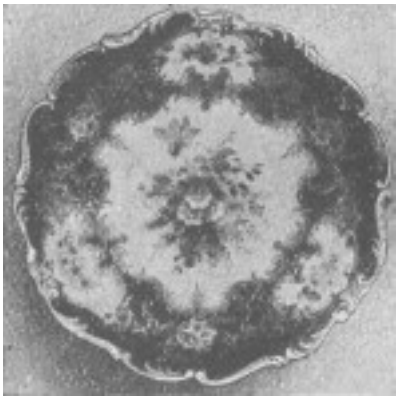
Coal Cellar. Method of converting a coal cellar into a useful room.

A cellar that is not wanted as a store for coal can be converted into a useful room, provided that it is dry and there is sufficient height to move about. The walls may be covered with old or cheap linoleum, with the back of it facing the room, as it is damp-proof and durable. Nail this to the walls and decorate it by panelling with narrow wooden strips. The ceiling is covered with beaver boards, nailed to the joists, and panelled in any way desired. The lino can be painted.

The stairs are improved by fitting a newel post, handrail, and balusters, as shown in the illustration, and another handrail secured to the wall with brackets. The floor can be concreted, covered with flooring boards, or if in fairly good condition and already concreted, can be tarred, covered with ordinary tarred roofing felt, and finished with linoleum.

The coal plate can be converted into an air shaft for ventilation by boxing it in and fitting a grating at the top. It is often feasible to fit a skylight. *See* Architecture; Coal; Cottage; House.

COALPORT: The China. One of the historic potteries flourishes at Coalport in Shropshire, and turns out excellent modern fabrics. The old Coalport works produced the most careful reproductions of Sèvres and Chelsea made anywhere; the mock marks may be recognized by being over the glaze, often with a small x added. The rose Du Barri, turquoise and apple-green grounds were especially rich, and the landscape panels neatly done. The Chinese willow pattern, which was first imitated at Caughley, was continued at Coalport. Old Coalport was undated, and much of it unmarked. *See* China.



Coalport China. Modern plate reproducing an old design. (Courtesy of Coalport China Co. Ltd.)

Coal Scuttle. *See* Cauldron; Coal Box.

COAL TAR. Coal tar is a black viscous liquid which is obtained after coal has been heated in the production of illuminating gas. It contains valuable chemicals used in the manufacture of dyes, drugs, and disinfectants, and after these have been extracted it is used to protect wood, brickwork, stone and iron, for which purpose it is merely painted on and allowed to dry.

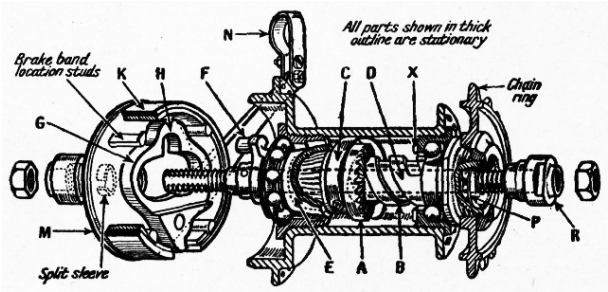
As a protective material it is widely employed in laying wood pavements and in preventing dust on roads. It would be of value in treating dusty spaces around the house, being sprayed or painted on the surface and then covered with sand or gravel, but it must be remembered that it has a poisonous effect on vegetation.

Coal tar soap consists of soap impregnated with a certain proportion of coal tar disinfectants, and is used for the same purposes as carbolic soap. Disinfectants made from coal tar are amongst the most effective that science has produced. *See* Disinfectant; Soap.

COARSE STUFF. A mixture of lime, sand, and hair is used in plastering under the name of coarse stuff, generally for the first and second coats on internal surfaces. The proportions are 1 part of lime to 3 parts clean, coarse, sharp sand, gauged by measure, not by weight. To this is added about 1 lb. by weight of long, clean ox hair to every 3 cubic ft. of the coarse stuff or, say, 3 pz. of hair to a pailful of mixture. *See* Ceiling; Cement; Lime; Plaster.

COASTER HUB. The design of this hub provides a free wheel, as well as a powerful brake having a very sweet action; the brake is applied by back-pedalling, while the free wheel or coasting action is obtained by keeping the feet stationary.

To take the driving and free wheel action first, it will be seen from A that there is no part of the mechanism that can be said to have any resemblance to the free wheel as commonly understood. Its mode of operation is as follows: A and B are the driving members, and rotate as one with the chain ring; B is machined integral with the chain ring seating. On A is secured the friction spring C, which bears against the inside of the hub shell. It follows that if B is rotated in a forward direction faster than the hub shell is moving, then A, the rotation of which is being hampered by the frictional contact of the spring C, will be made to screw itself on to B through the medium of the quick pitch screw D. The drive to the hub is taken up by the teeth shown on the face of B meshing with the corresponding teeth on the inner face of the hub shell, marked X. The harder the pedalling, the firmer will become the grip of these teeth, so ensuring there being no possibility of slip.



Coaster Hub. Diagram showing the principle on which the hub is constructed.

The free wheel, or coaster action, is practically a reversal of the foregoing, and is obtained in this way. Stop pedalling and the hub, which is still being rotated by the momentum of the bicycle, will now be rotating faster than B. The result is that, through the medium of the spring C, the cone A will unscrew itself along B, thereby becoming disengaged from the hub. Thus the hub is left to rotate free, whilst the cone A is left stationary with B, ultimately making a very light contact with the brake operating cone clutch E.

Operating the Brake. To operate the brake it is only necessary to move the pedals in a backward direction. This will further unscrew A off B. Therefore, A will be forced tightly into the brake clutch cone E, and a further backward direction of the pedals will cause the pin F to operate the cam lever G by means of the slot H, into which it fits, thus expanding the brake band K against the brake drum that is a part of the hub shell. The pin F is machined integral with the cone E, and is held in a stationary position by the slot H.

The brake band with operating cam lever G is held in position by the cover plate M, the arm of which is secured to the bottom chain stay of the bicycle by the clip N. The brake shoe is returned to rest by the

natural spring of the brake band itself. This band is formed of two metals; the outer band, which takes the wear, is of phosphor bronze, and the inner band, which acts as the brake release spring, is of spring steel. The brake is immediately released by a forward movement of the pedals, which action by means of the quick pitch screw D immediately draws the cone A from the brake cone E. The spindle which passes through the centre of the unit carries the cone R, for the ball race P, which is provided to take the thrust of the cone A during brake application, and is adjusted in the usual way. When fitting the hub to the machine it should be noted that this adjustment also controls the main bearings.

The proper functioning of the hub depends almost solely upon freedom of movement between the quick pitch screw on A and B. Therefore, wash out with paraffin occasionally and lubricate at regular intervals, as specified by the makers. A point to remember with practically all forms of coaster hubs is that the brake will be gradually wearing away its frictional faces during the whole of its life; which means that the day will come when the hub as a brake will fail to operate. To forestall this contingency, make a point of noting how far the pedals have to be reversed before the brake operates. When this distance becomes excessive it is time to renew worn parts.

Other types of coaster show a certain amount of similarity in their design to the hub already described, i.e. the brake is applied through the medium of friction plates or by an expanding split sleeve operated by backpedalling. The coaster hub is frequently combined with a change-speed gear, and a diagram of a typical hub is given in the article on three-speed gears. *See* Bicycle; Brake; Gear.

COATING: For Clothing. The wool cloths used in men's suits are called in general coatings, and their variety is great. Coatings are ordinarily about 54 in. wide, and thus more economical to cut up into suits and costumes than the narrower and lighter dress stuffs. Their weights run from about 8 to 22 oz. per yard. Wool cloths materially heavier than 22 oz. are over-coatings or mantlings. In single (i.e. 27 in.) width the goods are called trouserings or vestings.

Coating serges, most often plain black or blue, are the chief type of plain coating; fancy coatings have check, stripe, or other patterns, usually in coloured threads. Coating is best for classical tailored suits for women. Warmer in wear than wool stuffs, coatings are also more expensive. Botany coatings are smoothest to the touch, and cost more than Cheviot or crossbred cloths. In buying coating serges it is advisable to see that they are warranted fast dye and fully shrunk. *See* Cloth; Serge.

COBAEA. A quick-growing climbing plant popularly known as cups and saucers, owing to the shape of the flower. It is raised from seeds under glass in spring and is usualfy grown in the greenhouse. Pron. Co-bē'-a.

COBBLER: The Drink. This long drink is made with almost any kind of wine or with brandy, whisky or gin. One of the best is sherry cobbler, which can be made from about ¼ pint sherry and a teaspoonful each of sugar syrup and pineapple syrup or curaçao. Ice well, and stir up. Strain into a tumbler which has been filled with broken ice and serve with straws. Champagne or moselle cobbler is made with one glass of champagne or moselle in a large tumbler, a spot of old brandy, a slice of lemon, and sugar if desired. Finally fill up the tumbler with crushed ice.

COBBLE STONE. Round cobble stones are used for paths and roadways, especially in the Midlands and the north of England and in Scotland. Walls of buildings are sometimes constructed with them in districts where this material abounds. They make cheap and durable garden paths, as they present a dry surface under most conditions.

Cobbles are laid by first excavating the top soil and ramming until a firm base is obtained. The stones are then set in sand or fine earth and beaten down to a uniform surface with a beetle or mallet. Considerable skill is needed in choosing and setting the stones and to secure a bond or stable condition by properly placing them one with the other, so that no stone lies unsupported. They can further be secured with a grouting of cement mortar.

COB LOAF. A white loaf of bread, shaped into a roundish form, and baked on the bottom of the oven and not in a tin, is in certain localities called a cob loaf. *See* Bread.

COB NUT. A variety of the hazel-nut, cob nuts are frequently cultivated. Kentish cobs are considered specially good, being large and well-flavoured. They should be gathered when fully ripe, but before the lightest touch causes them to drop from the bushes, and dried well in the sun. After that, in order to keep them, put them in a cool, dry place, or pack them in layers with salt in dry jars. The cob is a good dessert nut, the kernel being sweet and firm. It is larger than the hazel or Barcelona, and is rounder than the filbert. *See* Filbert; Hazel Nut; Nut.

COBURG CAKE. To make these little cakes, cream together 3 oz. sugar and 4 oz. butter, and add two beaten eggs and 1 teaspoonful golden syrup. Beat well, and then mix in 6 oz. flour, 1 small teaspoonful baking-powder, 1 teaspoonful ginger, the same quantity of cinnamon, ¼ teaspoonful mixed spice, and a little milk to bind. Half fill some greased patty tins with the mixture; bake for about 20 min. in a moderate oven.

COCAINE: Its Uses. An alkaloid that is obtained from coca leaves, cocaine is used in medicine chiefly as a local anaesthetic. Thus it is useful in eye work and in operations on the nose and throat and elsewhere; it is

of great service in dentistry. For most of these purposes it is combined with suprarenal extract. It is also used sometimes in cases of pruritus. Among other conditions which may be benefited are sea-sickness and the vomiting of pregnancy and asthma.

But its employment should be limited as far as possible to single occasions, as a craving for the drug is very easily established, and the moral and physical degradation thus produced is a price which no person can afford or should be allowed to pay for the relief of any pain or discomfort whatsoever. Cocaine can only be procured by a patient on a doctor's prescription, and a fresh prescription must be procured for each occasion.

In poisoning, among other symptoms there may be difficulty in breathing and convulsions. Pending the arrival of the doctor sal volatile may be given or strong coffee by the mouth, or, if necessary, by an enema.

COCCIDIOSIS: The Disease. This is a disease of various animals caused by the multiplication of a very small protozoan parasite in the tissues of the intestine and liver. Animals most frequently affected are rabbits, poultry, feathered game, sheep, goats and cattle.

In the rabbit, coccidiosis may affect either the liver or the intestinal wall. The disease may take an acute or a chronic course. As a rule the acute type is seen only in young animals, which appear sleepy and dull. In the early stages of the disease they may eat and drink ravenously when roused. Later they refuse food and rapidly become emaciated. Not infrequently there is a profuse discharge of saliva from the mouth. Diarrhoea sets in and the animals die within a short time of the onset of the first symptoms. Where young rabbits are dying in large numbers and the deaths are usually preceded by diarrhoea,the owner should always suspect coccidiosis as the cause and send material for microscopical examination to the Ministry of Agriculture, from whose Bulletin No. 6 these particulars are taken. In older animals the disease takes a more chronic course, and the mortality is not nearly so high.

Amongst poultry the symptoms of the disease are similar and the acute type is essentially a disease of young birds. It is commonly classed by poultry breeders as white diarrhoea, or white scour of young chickens, but not all these are due to coccidia. It must be understood that coccidiosis is only one of several diseases, the most prominent symptom of which is diarrhoea.

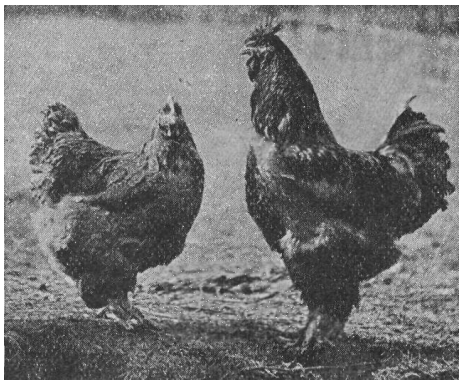
Certain workers have reported satisfactory results from the use of crude catechu. The catechu is powdered and mixed with water in the proportions of from 10 to 15 grains to one gallon of water, and this is given to a badly infected flock in place of drinking water. In the chronic type, where catarrh is a prominent symptom, washing of the nostrils and eyes with antiseptic solutions may be of some value.

Cardinal rules to be observed if prevention of outbreaks amongst young animals is desired may be stated: (a) Use high, well-drained land for young stock and take care that the land chosen is clean, that is, that it has not been soiled during the last twelve months by the faeces of animals suffering from the disease or even by any adult animals. (b) Avoid overcrowding. (c) Keep the young separate from the older stock until they are past the age of two months, (d) Keep the foster-mothers, pens, or hutches clean. Where these are of the floorless type move them frequently, (e) See that a good supply of fresh drinking water is available, and use a type of drinking trough not likely to be soiled by faeces.

Once diagnosis has been made by means of microscopical examination, all sick animals should be segregated and their droppings burnt. Carcasses of any animals that die must also be burnt. The pens or hutches containing the healthy animals should be disinfected thoroughly with hot water and strong cresol, or 3 per cent, sulphuric acid, every other day. Lime washing of the pens will serve as well. Where pens of the removable type without floors are used, they should be moved to fresh ground and cleaned out every other day. The object of fixing this 48 hour interval is to ensure that any parasites passed out with the faeces shall not have sufficient time to enable them to reach the infective stage before the animals are again moved or the pens thoroughly disinfected. Infected pastures may be given a top dressing of quicklime, say, 6 cwt. to the acre. *See* Poultry; Rabbit. Pron. Coc-cid'-i-ósis.

COCHINEAL. The red colouring matter obtained from the cochineal insect is most valuable in the kitchen, being perfectly harmless and devoid of taste, while by its use the appearance of many foods, such as blancmanges, stewed pears, etc., can be greatly improved.

COCHIN FOWL. This is one of the breeds of poultry that has come much to the fore from an exhibition standpoint but in so doing has suffered from a utility standpoint. It is a massive bird with heavy feathering. There are several varieties, buff, partridge, black and white being the most popular. The cochin is considered by some a good winter layer, but its merits as a table fowl are small. *See* Poultry.



Cochin Fowl. Cock and hen of the partridge variety.

Cochlioda. The name of a family of orchids with showy flowers. They need the same treatment as does the odontoglossum (q.v.).

COCK - A - LEEKIE. This highly nutritious soup has its foundation in chicken stock and leeks. A cheap way of making the stock is by simmering the neck, gizzard, feet, and bones of a fowl for one or two hours in salted water. To one quart of stock, which should be skimmed of all fat and strained, four leeks should be allowed. These are cleaned, trimmed, and cut into inch-long strips, and put into the stock, with a small onion, carrot and turnip, grated finely. Then bring the whole to the boil and simmer for about half an hour. Salt and pepper should be added, and if the soup is not considered thick enough, a white roux may be added. The roux is made by melting a tablespoonful of margarine in a saucepan and stirring in the same quantity of flour until a smooth paste results. A little of the soup should be poured into the roux in the pan and stirred round until it is liquid, and the liquid then added to the soup—which should be brought to the boil again.

COCKATOO. A member of the parrot family, the cockatoo is distinguished by its crest of feathers. Compared with the parrot, though equally docile and affectionate, it is an indifferent talker. The two species most commonly kept as pets are the great white-crested and the lesser, or sulphur-crested.
Like the parrot, the cockatoo may be kept in a large bell cage, or it may be chained to a stand. *See* Parrot.

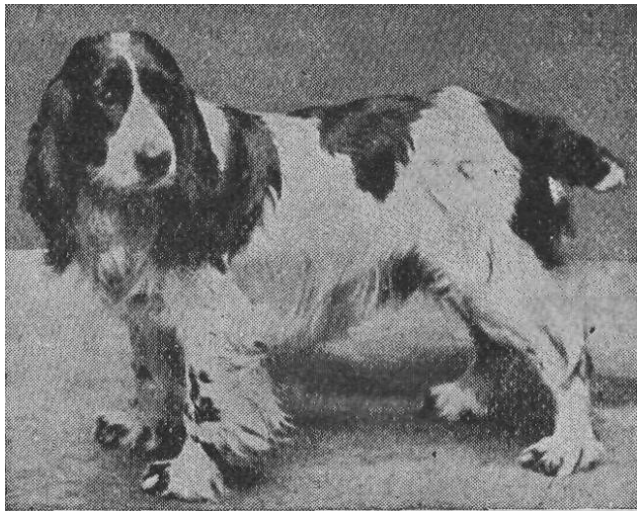


Cockatoo. Specimen of the sulphur-crested species, with crest erect.

COCKCHAFER GRUB. The grub of the great brown "Maybug" is the cockchafer grub, which is quite capable of eating through thick roots, but fortunately is rarely seen in large numbers. It is not uncommon to turn one up when forking among trees, shrubs, and herbaceous plants.

When the grub is present in such numbers as are likely to become a danger or nuisance, it is well to dose the roots of suspected trees or shrubs with a strong solution of salt. As the grubs take three years to come to maturity, and can do quite a lot of damage during that period, it is well to destroy them while they are young.

COCKER SPANIEL. The smallest and merriest of all spaniels, this dog weighs from 25 to 28 lb. His cheery nature and bustling ways make him a universal favourite, either for work or as a companion. Fairly short in back, and moderately high on the legs, he is as active as could be wished. His head is cleanly chiselled, of moderate size, ears lobular, long, and set on low, clothed with long, silky hair; the eyes are hazel or brown in colour, harmonising with the coat, which may be all black, black and white, or roan, brown, liver and tan, black white and tan, etc. The tail, which is said to be indicative of blue blood, although set on low, should be carried in a line with the back, and when the dog is in action it will be waved incessantly to and fro. The coat of the cocker spaniel should be flat and silky, never waved or harsh. *See* Dog.



Cocker Spaniel. A popular animal noted for its lively nature, and used as a sporting dog.

COCKLE. The small shellfish known as cockles are found in great abundance on many parts of the British coasts. The double shells are rounded and deeply ribbed, more like scallop than oyster shells; the fish when cooked and removed from the shells are marked yellow and red. All cockles need to be thoroughly cleaned, otherwise they are exceedingly gritty. The best way is to wash well the shells till they are free from sand; then lay the fish in cold water to cover them, and a handful of salt and oatmeal, and leave them till the next day to rid themselves of any sand they may contain.

To open cockles, put them in a basin and pour on to them fast-boiling water to which a little salt has been added. Repeat this if the shells do not open easily with the point of a knife. When open take out the fish and cook them as desired. Cockles can be used in most recipes suitable for oysters. They make excellent patties or sauce. *See* Oyster.

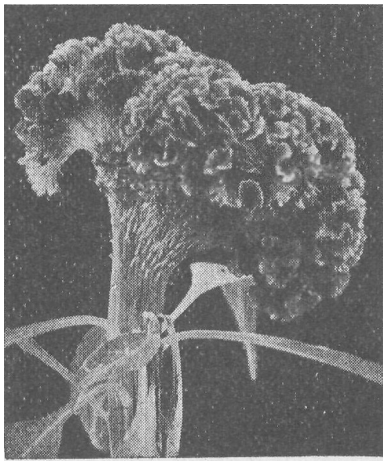
COCKROACH. Known as the black beetle, although its colour is really brown, the cockroach cannot claim

any close affinity to the hard-shelled beetle tribe.

Cockroaches are members of the straight-winged (Orthoptera) order of insects. They are much flattened from above and below, which enables them to hide in crevices during the day, and the upper pair of wings are merely leathery, instead of being horny, as in beetles. In the female of the common cockroach the wings do not develop, and are represented by mere scales, and those of the male cover only half of the body. The front part of the fore-body is developed into a broad shield under which the insect hides its head. The mouth is furnished with powerful jaws. There is a pair of very long, flexible antennae, and the long legs are covered with strong bristles.

A nocturnal insect, a house that swarms with cockroaches might appear in the daytime to be free from them but for the unpleasant odour characteristic of them. The eggs are contained in little horny purses, which are deposited in crannies; each receptacle contains 16 eggs. The common cockroach is an alien which came from the East. There are three native species, quite small creatures which never come into houses, but the alien, used to warmer conditions, only ventures out of doors in the hottest weather for the purpose of establishing itself in neighbouring houses. There is a smaller and paler species, known as the Croton bug (Blatella germanica), which emanates from Central Europe, and in some places is exceedingly abundant.

A good remedy against the cockroach is to strew its nocturnal haunts with fresh slices of cucumber, which, being consumed, renders them helpless. Beetle traps which entice them to fall into beer and get drowned may also be used with success in reducing numbers; but a more deadly device is the spreading of phosphor paste on thin bread or mixing it with honey and laying it in their way. Arsenic added to potato boiled and mashed, or mixed with the pulp of a roasted apple, is a certain remedy. Great caution must be observed in the use of these poisons, or food may get polluted with them. *See* Beetle Destruction.



Cockscomb. The curious head of the cockscomb, Celosia cristata.

COCKSCOMB.

This is the popular name of Celosia cristata, a half-hardy annual which bears cockscomb-like heads of bloom in crimson, yellow, and other colours. It is usually grown for the summer decoration of the greenhouse, but may be used to fill summer flower beds. Seeds are sown in February-March in a temperature of 50-55 degrees, and the plants are potted finally in 5-in. or 6-in. pots in a rich compost. Celosia plumosa, which bears feathery heads of bloom in red and yellow, needs similar treatment.

COCKTAILS AND COCKTAIL PARTIES

How to Mix Cocktails and What to Serve with Them

This is one of various articles containing suggestions for the hostess. Other entries of related interest are Bridge Party; Dinner; Luncheon. See also Hors d'Oeuvre; Sandwich

A cocktail party may be an informal gathering before dinner, usually from 6 p.m. to 7 or 7.30 p.m., or sometimes such a party is given later in the evening, when varieties of refreshments accompany the cocktail tray. These may take the form of hot toast sandwiches, containing a mixture of grilled kipper and bloater (freed from bones and skin and sharpened with a squeeze of lemon juice and a little cayenne), or a slice of grilled bacon. Tiny squares of hot buttered toast may have a spoonful of caviare or a curled anchovy placed on them; dishes of crisp potatoes are also liked, and may be eaten with the fingers at a cocktail party. Other refreshments suitable to be served on any such occasion are finger-strip sandwiches with appetising fillings such as smoked salmon or bloater cream, stuffed olives, plain biscuits buttered and spread with Gentleman's Relish, salted almonds and cheese straws. A big dish of fruit is decorative, and useful with dainty cakes, fruit punch and pineappleade to offer any guests who do not take alcoholic drinks.

Cocktail Appetisers. Although a cocktail is usually a mixed drink there are certain appetisers known under that name which may be served either at a cocktail party, or may replace hors d'oeuvre at a dinner or luncheon. An oyster cocktail, which may be put into stemmed glasses and accompanied by biscuits, is made with shelled oysters, and a tablespoonful of the following sauce to each glass: Mix one tablespoonful lemon juice, two tablespoonfuls tomato ketchup, a dash of tobasco sauce, a teaspoonful of vinegar and salt and pepper to taste. Clam cocktail can be made in a similar way, using six of the smallest clams and their liquor.

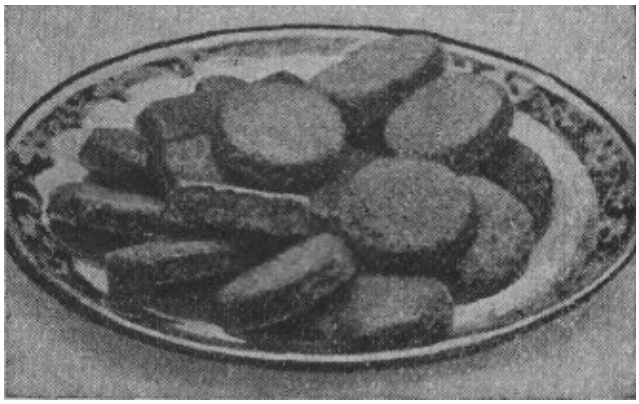
Tomato cocktails are made by placing the pulp of fresh tomatoes in a glass, flavouring with tomato sauce and garnishing with chopped olives. These appetisers should be placed on ice before serving.

A pick-me-up cocktail is the prairie oyster. For this two teaspoonfuls each of Worcester sauce and brandy, one teaspoonful of vinegar, and one of tomato ketchup are mixed together, the yolk of a fresh egg is dropped in, and a dash of red pepper added.

Many cocktails can be made easily at home A shaker, a pair of nickel receptacles is required to mix the ingredients properly and ensure the cocktail being cold. Crushed ice is required for most cocktails For an almost complete outfit the mixer needs a bottle each of dry gin, whisky, brandy, pale sherry, French and Italian vermouth, Angostura bitters, orange bitters, plain sugar syrup, orange syrup, grenadine or

raspberry syrup and such ingredients as oranges, lemons, eggs, tinned pineapples and soda-water. When serving a dry cocktail put an olive in the glass, with a sweeter one a cherry. nut, dried or desiccated, keeps for years in a dry place, and is used for cakes, puddings, and confectionery.

COCONUT BISCUIT. Prepare these by mixing 4 oz. desiccated coconut, 2 oz. flour. 3 oz. granulated or castor sugar, and 1 oz. cornflour. Beat up an egg, mix it with these ingredients, and then pour in sufficient milk to form the whole into a dry paste. Turn the mixture on to a slightly floured board, roll it out till it is about ¼ in. thick, dust it with sugar, and then cut it into rounds the size of ordinary biscuits. Place these on a greased baking-sheet and bake them in a hot oven for 10 or 15 min. These biscuits are better if baked the day after they are prepared.

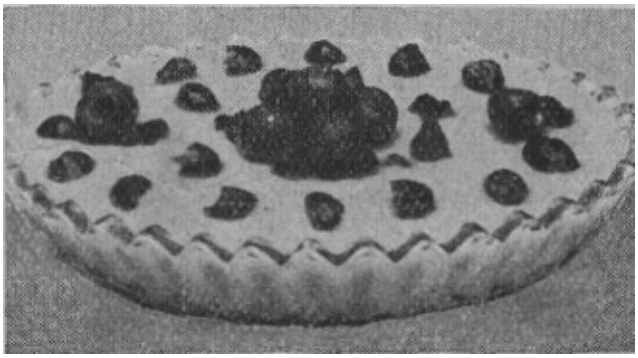


Coconut Biscuit. Small, round biscuits, very attractive for afternoon tea.

COCONUT CAKE. From the recipe here given a light coconut cake may be made, provided always that the ingredients are thoroughly beaten. Sieve ¾ lb. flour with 2 level teaspoonfuls baking-powder. Put 6 oz. each butter and castor sugar into a warmed basin, beat with a wooden spoon to a soft white cream, and work in 3 or 4 eggs, whisked to a froth. Now add the flour lightly, folding rather than stirring it in. Now mix in a teacupful of desiccated coconut and 6 tablespoonfuls of milk. Pour the mixture into a paper-lined tin and bake the cake in a moderately hot oven for about 1½ hours. A pretty finish is given by coating the top of the cake when cold with a little glace icing and sprinkling coconut and chopped pistachio nuts on the top.

Small coconut cakes are made by creaming together 3 oz. margarine and ¼ lb. granulated sugar and beating in an egg. In a separate basin sieve ½ lb. flour and 1 teaspoonful baking-powder, add ¼ lb. desiccated coconut, and then stir these into the sugar, etc., together with ½ gill or more of milk and a few drops of vanilla flavouring. Put the mixture into small greased cake-tins and bake them in a hot oven for about 20 min.

COCONUT CREAM. To prepare mix 3 oz. ground rice to a smooth paste with ½ gill milk. Put what remains from 2 pints of milk into a saucepan, together with 1½ oz. margarine or butter and 2 oz. white sugar, and when these are boiling pour them on to the rice paste. Return it to the saucepan and bring it again to the boil, keeping it well stirred. Then add 2 oz. desiccated coconut, cook the whole slowly for 8 or 10 min., and draw it away from the fire before adding a little almond or vanilla flavouring, ½ gill cream, and 1 oz. quartered glacé cherries. Mix all these ingredients together, then pour them into a glass dish and leave them to cool. Before serving decorate the top with some more glacé cherries.



Coconut Cream. Party sweet flavoured with coconut and ornamented with glacé cherries.

COCONUT DROP. These cakes are prepared from ½ lb desiccated coconut, 6 oz. castor sugar, 3 eggs, and a little almond flavouring. Whisk the sugar and eggs together for about 12 min., or until the mixture becomes thick and free from streaks, then sprinkle in the coconut and beat the whole thoroughly for a few minutes before adding the flavouring. Grease a baking-tin, take a dessertspoonful of the mixture at a time and drop it on to the tin. Cook the drops in a moderately hot oven for about 10 to 15 min., cool them on a sieve, and sprinkle with castor sugar.

COCONUT FIBRE. Made from the coarse fibrous covering of the nut or fruit of the coco palm, coconut fibre has many uses in the home. It is employed in horticulture, and occasionally as a packing material, sometimes as the fibrous constituent of plaster ornaments. Its principal domestic applications are in the form of matting, rugs and carpets. The material is made in different widths and obtainable in many colours, patterned and plain.

For hard wear on rough or uneven surfaces it has many advantages. It conforms readily to unequal surfaces, and is not seriously affected by damp. A tendency to roll up at the corners is checked by a drugget pin if on a wooden floor, or by a screw driven into a rawlplug in a solid floor. A countersunk brass screw and washer to suit is the best arrangement under these conditions.

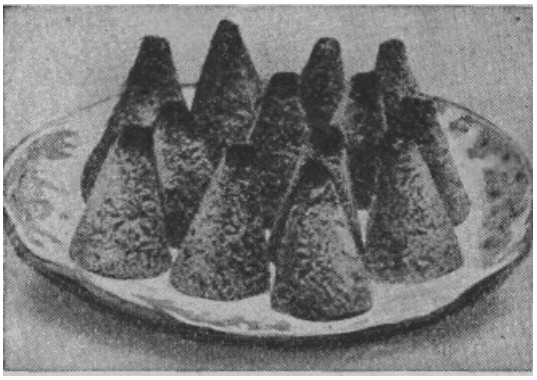
Periodical shaking and beating are essential, but in addition the matting can be washed and scrubbed to remove dirt and stains.

The fibre of the coconut is a useful medium in which to grow such bulbs as hyacinths, tulips, narcissus, snowdrops and crocuses in bowls. When making up a fibre bowl, a layer of charcoal should always be placed at the bottom of the receptacle, and the fibre must not be knotted or lumpy. *See* Begonia; Bulb; Hyacinth; Mat.

COCONUT OIL. The oil obtained from coconut, which in appearance resembles a white solidified fat, melts at a comparatively low temperature. Coconut oil is used in the manufacture of margarine, for which purpose it undergoes a process that deprives it of its taste. Large quantities are used in the manufacture of soap, a variety known as marine soap giving a lather with sea water; the soap is the basis of a shampoo for the hair. *See* Hair; Shampoo.

COCONUT PUDDING. Pieces of stale bread may be used in the making of a good baked coconut pudding. Prepare it by cooking 3 gills milk and ¼ lb. desiccated coconut in a saucepan over the fire for a few minutes. When the milk boils sprinkle into it 2 oz. breadcrumbs, and add also 1½ oz. margarine and 3 oz. white sugar. Mix all together thoroughly, then draw the pan to the side of the grate. Separate the yolk from the white of an egg and stir the former into the milk, etc.; add a few drops of ratafia flavouring and then fold in the white of egg, previously whisked to a stiff froth. Turn the whole into a greased pie-dish and bake in a moderately hot oven for about 35 min., or until the pudding is golden brown. It should be served in the dish in which it is cooked.

COCONUT PYRAMID. When possible, these cakes should be mixed the day before they are baked. Prepare them by mixing ½ lb desiccated coconut with ¼ lb granulated sugar, adding a beaten egg, a little vanilla flavouring, and enough water to make the coconut and sugar adhere when pressed together. Form tablespoonfuls of this mixture into pyramids, place them on rice paper in a baking-tin, and bake them in a cool oven until they are firm and lightly browned. A few drops of cochineal may be added to the mixture.



Coconut Pyramid. Cone-shaped cakes made with desiccated coconut, very popular with children.

C.O.D. Recognized abbreviation for cash on delivery, a method by which the Post Office collects money for goods sent through the post The amount collected must not exceed £40. The charge is 4d for parcels worth 10s. and under, then it rises to 6d. for those up to £1, to 8d. for those up to £2, and to l0d. for those up to £5. Beyond this there is an additional 2d. for each £5 or less. If the parcel is sent by rail the charge is 3d. more.

An incoming cash on delivery parcel is delivered by the postman in the ordinary way (except that, if the trade charge exceeds £5, the parcel is kept at the Post Office to be called for, notice of its arrival being sent to the addressee). The postman is strictly forbidden to give up a cash on delivery parcel, or to open it at the request of the addressee, or to allow the addressee to open it until the trade charge and any other charges due have been paid A delivery fee of 4d., in addition to the amount of the trade charge, is collected from the addressee of a cash on delivery parcel received from a place abroad. The amount of the trade charge collected is remitted to the sender of the parcel without deduction. No receipt is given for a trade charge. When the trade charge has been collected, the Post Office undertakes the responsibility for the due remittance of the amount to the sender of the parcel; and a trade charge, once collected, is in no circumstances refunded to the addressee.

This service does not apply to the Irish Free State. There is, however, a reciprocal service between Great Britain and various parts of the British Empire and certain foreign countries.

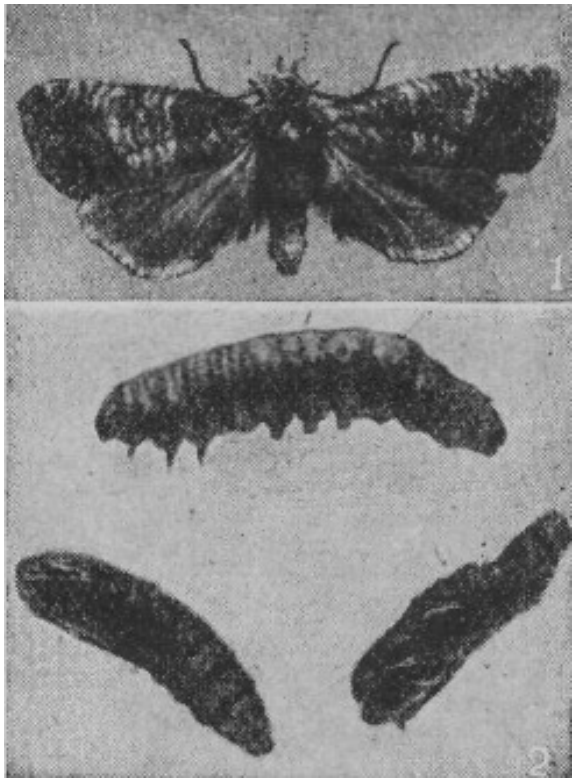
COD: How to Cook. A highly nutritious fish, cod is at its best from November to March. The liver contains valuable products, and can he cooked separately from the fish; from it is obtained the well-known oil. Cod's roe is also made into a separate dish. The head and shoulder of cod are the parts most in demand, but from the thin tail end suitably sized steaks for frying are obtained.

To boil cod, the fish is washed and placed in a deep fish kettle containing warm salted water, with a tablespoonful of vinegar added. It is then brought to the boil and allowed to simmer gently for about 30 min. The fish is served with parsley, egg, anchovy or caper sauce, or melted butter, and garnished with slices of lemon.

A method of baking a cod steak is the following: Wash and dry the fish, trim off the fins, and tie the steak in shape. Dip it in flour, brush it over with beaten egg, cover it with breadcrumbs, and then put it in a greased fireproof dish. Mix together 2 tablespoonfuls breadcrumbs, 2 oz. chopped suet, 1 dessertspoonful chopped parsley, and a teaspoonful chopped herbs. Season this mixture, heap it on the steak, lay a piece of greased paper over the top, and bake it from 15 to 20 min. Serve it in the hot dish with anchovy or other fish sauce poured round.

To fry cod steaks, wash and dry the fish, coat it on both sides with flour that has been seasoned with salt

and pepper. Fry it in hot fat until it is light brown in colour, then turn and fry it on the other side. Cod may be banded in June with old frayed sacking, folded paper or ropes of hay. If possible, two bands 4-6 in. wide should be used on each tree, one just below the junction of the branches with the trunk and the other a few inches from the surface of the ground. The larvae on leaving the fruit are likely to make their cocoons in the folds of the sacking or in the hay, and the bands must therefore be burnt in the autumn.



Codling Moth. 1. Perfect insect, magnified to show markings. 2. Caterpillar and two pupa skins, magnified.

All fallen fruit should be picked up and disposed of in such a way as to kill any larvae inside. All rubbish near the trees should be cleared away and burnt. *See* Apple; Pear.

COD LIVER OIL. Whether in its natural purified state or in the form of an emulsion, the oil extracted from the liver of the codfish provides a valuable nutritive tonic for invalids and particularly for consumptives and rickety children. It is a useful addition to the diet when one is working at high pressure; and persons suffering from chronic bronchitis will derive benefit from it. It is rich in the fat soluble vitamin A, which is so important in nutritional efficiency, its absence from a diet leading to the development of rickets and other conditions.

Cod liver oil is often prescribed with iron, as in the following tonic mixture, for a rundown thin child and for children developing tubercular glands in the neck. The dose is 1 to 2 teaspoonfuls three times a day after meals.

Cod liver oil	2 oz.
Syrup of ferrous phosphate	1 oz.
Oil of cassia	10 minims
Mucilage of gum acacia	4 oz.

Mixtures of cod liver oil, malt, and iron such as the following are also useful tonics to be taken during the convalescence after any severe and lowering illness: The dose for a child of 6 to 10 years is ¼ to 1 teaspoonful three times a day after meals.

Cod liver oil	1 oz.
Extract of malt	1 oz.
Compound syrup of iron phosphate	1 oz.

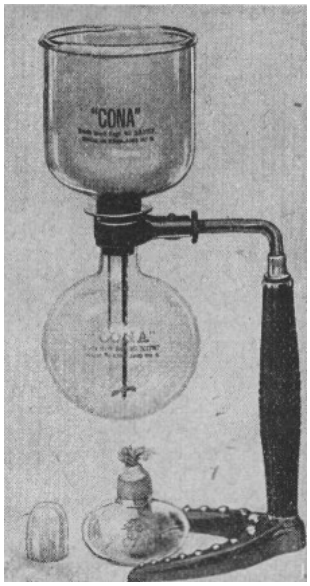
COELOGYNE. This has been described as the amateur's orchid, for it is one of the easiest to grow. The imported plants should be placed in a warm bed of moss and sprinkled with tepid water in the greenhouse, until the pseudo-bulbs have swollen to their normal size. They should then be placed in well-drained pans containing a mixture of loam and peat, with a little crushed charcoal, and treated as ordinary heated greenhouse subjects for winter flowering. C. cristata and its varieties propagate readily by division of roots. The flowers of C. cristata are white with yellow crest on the lip. Those of C. pandurata are green and black, a striking combination. There are other species and varieties. *See* Orchid. Pron. Coe-log'y-ne.

COFFEE. Coffee is a general stimulant and promotes the activity of the brain and the heart. It is refreshing when one is fatigued, and, like tea, its beneficial effects are more lasting than those of alcohol. In cases of heart disease and in prolonged depressing febrile diseases, e.g. pneumonia and enteric, coffee, either black or with milk, is a useful addition to the dietary.

How to Roast. In making coffee, if the best results are to be obtained, the berries should be freshly roasted and ground. If a coffee roaster is not available use an ordinary enamelled frying-pan. Melt just enough butter in the pan to moisten the berries, and turn them frequently over a smokeless fire or moderate gas stove until they become rich brown in colour. It is a good plan to roast them in relays, passing them to the coffee-mill at once, and making the coffee as soon afterwards as possible. If any of the berries turn black during the roasting process, take them out of the pan without delay. One of the strongest and most serviceable kinds of coffee mill is made of cast iron, and fitted with a funnel-shaped top, into which the beans are poured. The grinding action is controlled by means of an iron handle, which, when turned, causes the ground coffee to fall into a tin or basin placed immediately beneath the mill.

When using a coffee mill, make certain that the coffee is being finely ground, otherwise its full strength will not be extracted. If the coffee appears coarse, it is generally a sign that the mill requires readjusting.

A French method of coffee-making consists of allowing 1 tablespoonful of coffee to ½ pint of water, pressing the coffee down in the percolator or cafetière; pouring on j pint of boiling water and slowly adding as many coffee-cups of water as are required. Should the coffee-pot be made of silver, scald it out twice before pouring in the coffee, and if the latter has to stand for some little time before being used, keep the pot in a bowl of boiling water.



Coffee-making Machine. Right. 1. Cona coffee-making machine.



Above 2. Cafetière in fireproof ware.
Below. 3. Coffee-making machine component parts (Courtesy Cona Coffee Machine Co., Ltd.)



Flavour can be improved if the amount to be used is put in a cup, covered by a saucer, and placed in the oven for a few moments to warm; also by adding a pinch of salt to the made coffee. Reheated coffee loses its flavour. To make the grounds settle in the pot a little coffee should be poured into a cup and then poured back in the pot. This should be done several times.

Coffee is drunk either white or black—that is, with or without milk. Black coffee should be strong and may be served only with sugar after dinner. Never use cold milk for white coffee.

Iced Coffee. A method of making iced coffee consists of putting 4 heaped tablespoonfuls coffee into a quart of boiling water, boiling them in a pan over the fire, then removing the pan for a few seconds, replacing it again and re-boiling the whole. Repeat this process 2 or 3 times, then let the coffee stand for 5 or 10 min. before straining it. Put 4 oz. castor sugar and ½ pint milk into a pan over the fire, stir these until the sugar has dissolved, and then bring them almost to the boil. Add these to the coffee, and leave the mixture to cool. When it is quite cold, add ½ pint cream and a few drops of vanilla essence, putting the jug in an ice cave or in a vessel which is well packed round with ice.

Coffee-making Machines. There are many varieties of coffee-making machines in most of which the same principle is employed of straining the freshly ground coffee through boiling water. In a cafetière the necessary quantity of coffee is placed in an upper part which forms a strainer. Boiling water is then poured in, which passes through and is impregnated by the coffee, and percolates through the strainer into the lower part.

In some of these coffee-making machines there are two vessels, an upper and a lower, on the same principle. In others the upper vessel is of glass and the container is made of brass with a small spout; when the coffee has passed into the container the latter can be removed for use as a coffee-pot.

In another class of machine a glass globe is used, and in this the filtered coffee is heated by means of a small spirit lamp. The coffee is placed in an upper glass vessel and percolates into a boiler or lower glass vessel, circulation being effected by a central connecting pipe These machines are generally arranged so that when the coffee is ready for service the upper vessel is removed, and the lower glass globe, complete with the stand and handle, acts as a coffee-pot.

Figs. 2 and 3 show a cafetière with its component parts. As the material of which these are made is fireproof, they can be left to simmer over a gentle heat and thus extract the best of the flavour from the coffee.

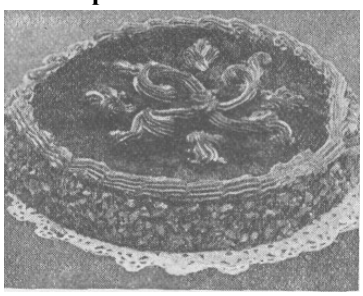
Coffee Service. In silver or plate the 18th century designs for the three-piece coffee services have not been improved upon. Beautiful among these are the octagonal style with ebony, fine wicker, or stained green ivory handles to coffee pot and jug, and moulded bases; the pear-shaped, plain-bodied pattern with ornamentation round the edge of lid and foot with round sugar basin; and the vase-shapes copied from old Sheffield plate examples in Adam styles.

For after-dinner use coffee cups in one of the many old English designs look best with this description of service, while the conventional patterns, the plain coloured china rimmed with black, the all-black except for gold or coloured insides, or the harlequin sets are most effective with coffee pot, jug, and sugar bowl to match.

For Turkish coffee, the correct beaten brass or copper pots can be bought with spirit stove and cups in metal containers to match, but these services are somewhat expensive. With a percolator any cups that are liked can be used. In earthenware, coffee pots and milk jugs are sold to match most of the good stock patterns, and are made in various sizes suitable for breakfast use. *See* Breakfast.

COFFEE CREAM SANDWICH. Make this in a round, shallow, greased cake-tin lined with greased paper. Whisk the yolks of 3 eggs with ¼ lb. castor sugar for 15 min. Mix together ¼ lb. flour and 1 level teaspoonful of baking-powder then sieve and add them to the yolks and sugar. Whisk the whites to a stiff froth,

fold them lightly into the other ingredients and add milk if required. Put the mixture into the prepared tin and bake it in a hot oven for about 20 min. When cold split the cake in half, and prepare some icing with ¼ lb. butter, 1 oz. chopped walnuts, 9 oz. icing sugar, and 2 dessertspoonfuls coffee essence (obtainable at any grocery store). Beat the butter and sugar to a cream, add the flavouring; and then put ¼ of the icing aside. To the remaining ¾ add the chopped walnuts, then spread this on top of the lower half of the cake, replace the top half, and leave it to get firm. Spread the outside of the cake with 3 tablespoonfuls of apricot jam, and sprinkle over this 3 oz. of chopped walnuts. Decorate the top with the remainder of the icing, forced through an icing tube into a decorative pattern.



Coffee Cream Sandwich, a dainty and delicious cake for afternoon tea.

COFFEE ÉCLAIR. These finger-shaped cakes are made in the same way as chocolate éclairs, except that they are coated with coffee icing. *See* Chocolate Éclair.

COFFEE ICING. To prepare coffee icing, put 2 oz. fresh butter into a basin and beat it to a soft cream with a wooden spoon. Then add ¼ lb. sieved icing sugar and beat the two ingredients together until the mixture looks like whipped cream. Gradually add about 1 dessertspoonful of coffee essence. A forcing-bag and pipe should be employed to apply the icing on cakes.

An excellent coffee glacé icing which must, however, be used immediately after making, can be prepared from ¾ lb. icing sugar, 1½ tablespoonfuls strong coffee and the same quantity of hot water. Mix all these ingredients well together, and warm the whole.

COFFEE MÉLANGE. Cut a pint packet of vanilla jelly into small pieces and pour over them a pint of hot—not boiling—milk. Stir the mixture occasionally until the jelly is thoroughly dissolved. Let it become almost cold, then add 2 large tablespoonfuls of coffee essence. If the jelly is not sufficiently sweetened, add extra sugar dissolved in a little hot milk. Pour the whole into a wetted mould, and when it begins to thicken stir in a thinly sliced banana and a few slices of tinned apricots, peaches, or pears. When the mould is set, turn it out on to a glass dish, and serve it with whipped cream.

Cognac. The French brandy known as cognac is distilled from the vines of the Charentes. It is acknowledged to be one of the finest of all liqueur brandies. *See* Brandy.

COINS: THEIR COLLECTION AND ARRANGEMENT

With Instructions on Making a Display Cabinet for the Specimens

Other collecting hobbies described in this Encyclopedia include Birds' Eggs; Butterfly; China; Stamps. See also Brass; Pewter; and Amateur Carpentry

The earliest known coins are those of Greece, with only an obverse design, the reverse showing the impress of the punch or vice which held the ingot steady for the coiner's hammer. These date back 700 years B.C., and are supposed to have been struck in the Greek colonies in Asia Minor, which were more or less under tribute to Lydia. No earlier coins are extant of ancient Egypt, Babylon, or Assyria, and the original Jewish shekel was only a weight. So the Greek coinages, from the period stated to about the 3rd century A.D., form the first division in numismatics.

The next important division is that of the Roman coinages, starting nearly 400 years B.C., with large coins cast in bronze, and ending with the fall of Rome in the 5th century A.D., although the Latin language on Byzantine coins was continued until the 11th century, when it was finally displaced by Greek. A third division of numismatics is concerned with Oriental coinages distinguished by Eastern languages on the specimens and comprehending Persian, Arabian, Afghan, Indian, Chinese, and Japanese coins.

The later coinages of the Western world, can be divided into two periods: (1) from the Carlovingian coinage in the 8th century, when the Roman denarius became a denier or penny, to the rise of the U.S.A.; (2) the ultra-modern coinages of the democratic era down to the present day.

Among foreign coins of the former period is the silver thaler, daler, or dollar, coined in Germany about the time when Spain was under German domination. This coin was subsequently introduced by the Spaniards into the Indies and America as a piece-of-eight, the Spanish sixpence, or royal, or real, being then equal to one-eighth of a Spanish dollar The modern American silver dollar is thus the lineal descendant of the piece-of-eight.

British Coins. As regards British coins, the custom has been adopted of placing the head of each sovereign in a direction opposite to that of the previous one. Thus the head of George V faces the reverse way from that of Edward VII, as can be seen from a glance at any of the coins issued during their reigns.

British coins may be divided into three sections: (a) coins issued in Great Britain by regal authority, (b) tokens issued in Great Britain by private authority, (c) coins and tokens of Britain Overseas. In these three sections is a magnificently varied range for specimens. A complete series of types of English pennies, in bronze and copper, is quite a fascinating start for a small

(Continued in page 493)

COINS















Coins: pieces typical of those found in the collector's cabinet. 1. Greek, silver coin, Corinth, 350-250 B.C. 2. Roman, brass coin, Vespasian, A.D. 70-79. 3. Isle of Man, copper penny, 1758. 4. Spanish, silver piastre or piece-of-eight, 1762. 5. English, copper penny, 1797. 6. English, copper penny, 1841. 7. Bengal, copper half anna, 1835. In each case the obverse of the coin is shown either above or to the left of the reverse.

collection before developing a larger one. Begin with the bronze penny of King George V, already described. The penny of Edward VII has DE S. for the designer's initials, meaning de Saulles, and the legend on the obverse shows, for the first time, the monarchical title BRITT: OMN: REX—King of All the Britains.

There are two types of Queen Victoria's pennies in bronze and one in copper. The later bronze, which was coined from 1895 to the end of the reign, depicts the crowned queen in her widowhood, with IND: IMP: (Empress of India), added to the royal title. The earlier bronze type, 1860 to 1894, pictures a younger queen, and the crown is not expressed, while on the reverse a lighthouse and a ship are in the device.

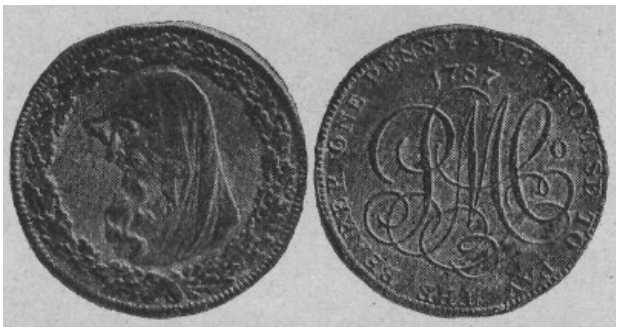
Penny Coinage. Preceding the bronze coinage was the larger Victorian penny in copper, from 1839 to 1860, with the date on the obverse, under the head of the queen as she appeared in her girlhood, and the exergue on the reverse bears the rose, shamrock, and thistle. The 1860 penny is very rare.

The copper pennies of William IV and George IV differ very little in style from those of the queen's first issue. Prior to them was the George III penny of 1806 and 1807. And when the George III penny of 1797, with its raised rims for the legends and with the date on the reverse, is reached, one has got to the first copper penny issued by royal authority in England. The copper pennies circulated in England during the token period were mostly those issued by private authority, and a collector needs great judgement in selecting specimens. Between the years 1811 and 1815 these pennies were coined in at least 70 different types all over England and Wales. Each of the genuine specimens usually indicates clearly the name and locality of the issuer.

The beautiful Anglesey pennies were issued by the Parys Mines Company in 1787-91; but most of the other so-called pennies dated in the latter part of the 18th century are either private medals made by collectors, or imitation tokens made by dealers for sale to collectors. The rare book of plates by Pye, of Birmingham, published in 1801, is a good guide to the genuine tokens of the time.

There are copper pennies issued earlier still, in the 17th century—such as Prockter's Lancaster penny of 1671, with the Stanley crest of an eagle and a child; Sytton's Blackfriars penny of the same year, with the figure of a friar; and Taylor's penny, issued at Settle in Yorkshire in 1668. When one has included all these with the other types sketched a fairly complete collection of English copper and bronze pennies will have been obtained. Then the halfpennies in copper and bronze can be tackled and the farthings, and the silver pennies that reach from Charles II right away back to the time of Offa of Mercia. The rest can follow later.

Clean dirty coins with oil of turpentine and a badger-hair brush, but do not rub them so as to take off the tarnish of age.



Coin Collecting. Obverse and reverse of the Anglesey Penny, one of the best designed copper tokens issued in place of coins during the 18th century.

Making a Coin Cabinet. The simple cabinet shown in Figs. 1-5 is quite easy to construct, and the home worker will find many helpful hints in the article on Birds' Egg Cabinet.

First make the coin trays themselves. This can be done by obtaining from any master-carpenter or wood-dealer or other worker in timber, half a dozen planed unpolished pieces of mahogany board, about ⅜ in. thick, and of convenient size, say, 11 in. by 8 in., according to price and to the sort of case into which they are ultimately to be fitted. A carpenter's brace will be needed, with several centre bits of the respective sizes required for sinking circular partitions in the wood to hold the coins (Fig. 3). Some kind of press to steady the tray while it is bored should be improvised (Fig. 2).

A piece of deal planking under the mahogany is useful while boring, as it eases the strain on the tray. The pivot of the bit must go right through the tray, but when the circle has been sunk about ⅛ in., it is best to finish off with a chisel, so as to get a flat surface on which to rest the coin. The boring of a tray and its chiselling would be two operations. When all the circles in a tray have been sunk and chiselled and the tray sandpapered, the coin-spaces can be lined with stiff white paper on which to enter references to the catalogue or other particulars. A rebate is formed at each end of the tray, thus leaving projection which runs in a groove formed in the end wall of the cabinet (Fig. 5). The completed tray is shown in Fig. 4.

The cabinet itself may be made to the dimensions required, the number of trays being suited to the collector's present or future needs. The cabinet illustrated accommodates fourteen trays; a larger one might have the trays arranged in two tiers on the lines of the Birds' Egg Cabinet. The Methods of construction may be gleaned from the last named article, and from the one on Cabinet Making.

COIN TRICKS. One of the simplest of coin tricks is to offer to spin a penny on a smooth table, from which the cloth has been removed, and to tell, when

COIN COLLECTING

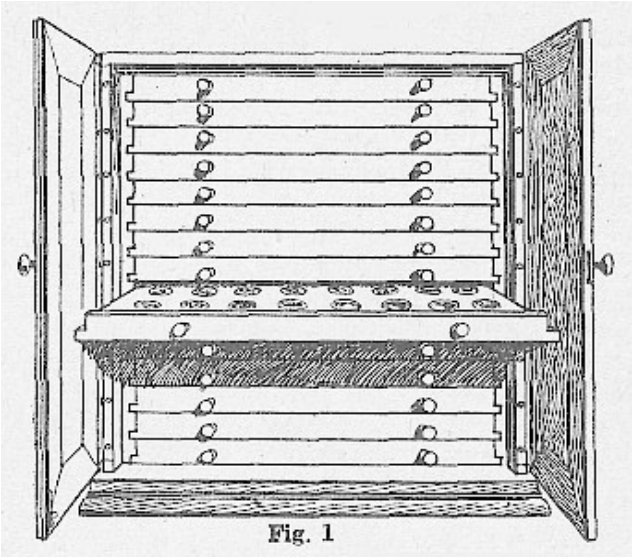


Fig. 1

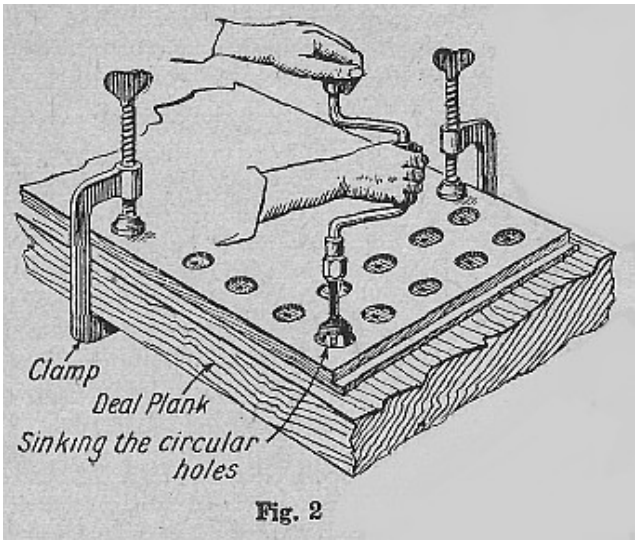


Fig. 2

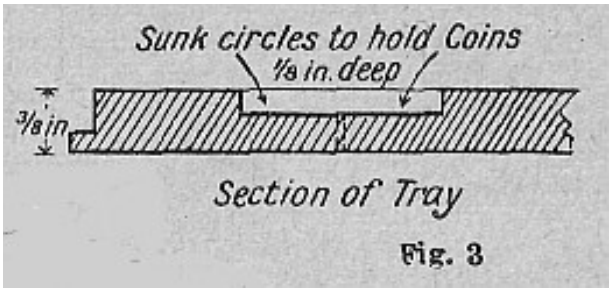


Fig. 3

A useful cabinet and diagrams illustrating how the trays should be adapted for displaying the specimens.

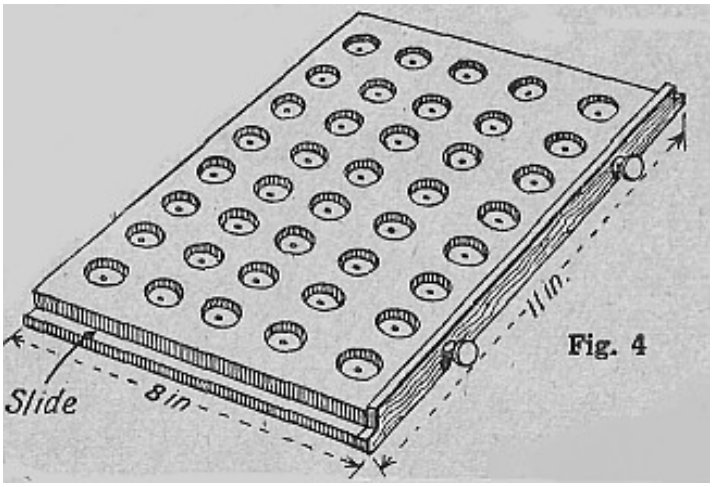


Fig. 4

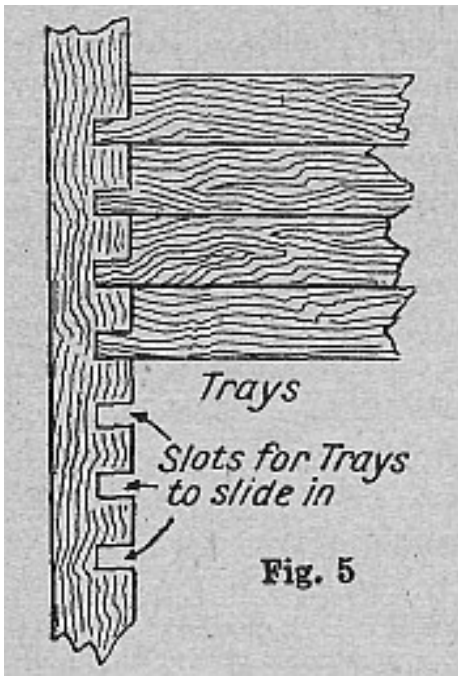


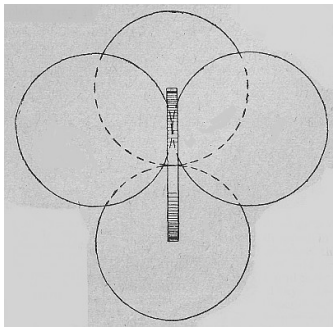
Fig. 5

blindfolded, whether it has come down head or tail. The secret is a very simple one. On the extreme edge of the penny a small notch is made with a penknife, so that a tiny piece of the metal projects. This projection is so small as not to be noticed. When the coin is spun it will settle on the unnotched side with the usual long, steady, even whirr.

If it settles on the notched side, however, the time of settling is only about half the other, and the sound, instead of gradually becoming fainter until it ceases, ends suddenly. The difference in the two sounds is rarely detected by those who do not know the trick.

The simpler the principle of a trick the more difficult often is its detection. The following depends upon a simple arithmetical principle. Announce to the audience that any member can take a handful of coins and that you will say whether the number is odd or even.

Ask him to place his coins in a hat, and announce that you will, even when blindfolded, add a handful of coins from your own pocket so that the total will be odd if the number of his coins is even, and even if the number of coins is odd. When you have dropped in your coins ask him whether the number he chose was odd or even, and it will be found that the total in the hat is always the reverse. The trick depends simply upon the performer dropping into the hat an odd number of coins. The principle involved in this coin trick is the simple one that the sum of an even and an odd number is odd and of two odd numbers even.



Coin Trick. Fig. 1. Diagram showing how to place five pennies so that each touches four others.

The following trick is one which will keep an audience guessing for a very long time before they solve it. The trick is to place five pennies so that each penny touches four others. Fig. 1 shows how the pennies should be arranged in order to perform the trick.



Coin Tricks. Fig. 2. How to take a halfpenny from the table without touching the coin.

A simple vanishing puzzle is performed with a threepenny-piece or a sixpence and an ordinary matchbox. The coin is spun on the table, and the performer, while it is spinning, brings the matchbox sharply down on it, and asks a member of the audience to call out whether it is head or tail. The matchbox is lifted to verify his guess and the coin is found to have disappeared. The coin is actually forced into the box, which should be empty when the performer brings the box on to it.

Another puzzling trick is to take a halfpenny from the table without touching the coin. The halfpenny is placed on the table at a short distance from the edge, and the half-open hand a little behind it. The performer blows sharply upon the table in front of coin, which will jump into the hand. *See* Conjuring.

COKE: For Household Fires. Of the coal heated in gasworks for the production of gas, about ⅝ by weight remains as a carbonaceous residue known as coke. This coke contains about as much heat, weight for weight, as coal, burns without smoke and usually costs less than the better sorts of coal. For domestic purposes it can be burned in slow combustion stoves and in many anthracite stoves instead of anthracite, though a larger quantity of fuel will then be required. It is also employed in heating boilers.

For open fires coke is best mixed with coal, especially for kitchen ranges. The semi-cokes or smokeless fuels, such as coalite, are made at a much lower temperature than gasworks coke, and therefore contain a larger percentage of the volatile matter of the original coal. The result is that they ignite more easily than ordinary coke and produce a more cheerful fire, while giving off little or no smoke. *See* Breeze Block; Coal.

COLANDER. One of the most useful articles in the kitchen equipment, the colander is a perforated bowl through which vegetables are drained so that they will be free of moisture when dished up. *See* Baking.



Colander made of aluminium, with perforated presser. (Staines Kitchen Equipment Co., Ltd.)

COLCANNON. This consists of potatoes and cabbage boiled together and mashed. Cold remains of potatoes and cabbages fried together are in some places called by the same name.

COLCHICUM, Another name for meadow saffron or autumn crocus. *See* Meadow Saffron.

In medicine colchicum, a drug obtained from its seeds and crowns, is used to relieve the pains of gout. The wine of colchicum is the preparation commonly chosen, and is combined as a rule with an alkali and with Epsom salts. The dose is 10-30 minims. The active

principle colchicine is sometimes used instead. Colchicum should only be used by the orders of a doctor.

COLD: Prevention and Cure. This is an acute infection producing sore throat, a "stuffed" head, and later a free discharge from the nose, headache, signs of feverishness, and possibly bronchitis. Close contact with a person suffering from a cold, as in a room, a railway compartment or the inside of a bus, is almost certain to produce infection. In addition, sources of irritation may be present in the nose, or a chronic irritated condition of the throat and the back of the nasal passages may be kept up by constipation, dyspepsia, pyrrhoea, the abuse of alcohol or tobacco. If the colds are frequent and there is no evident cause of irritation, advice should be taken about vaccine treatment.

The tendency to cold may be lessened by hardening oneself against the chilling effects of changes of temperature. This can be done by exercise in the open air and by keeping rooms thoroughly ventilated. The windows of the bedroom should be widely open at night. The morning tub is very useful, but if it is not taken a good substitute is to douche thoroughly the neck and shoulders with cold water and a sponge. The underc1othing should be of wool or, for those who can afford it, silk.

Treatment. In treatment of the condition it is wise to consider whether the cold is not the beginning of such a condition as measles or influenza, as in such a case the patient should keep to bed, as also he should do if he is particularly feverish even from a common cold. In any case a hot mustard foot bath at night is a good thing, with some hot whisky and lemon, and perhaps 5 grains of Dover's powder. Headache may be relieved by 10 grains of aspirin. If the patient perspires freely he should be careful about exposure on the following day, should he go out.

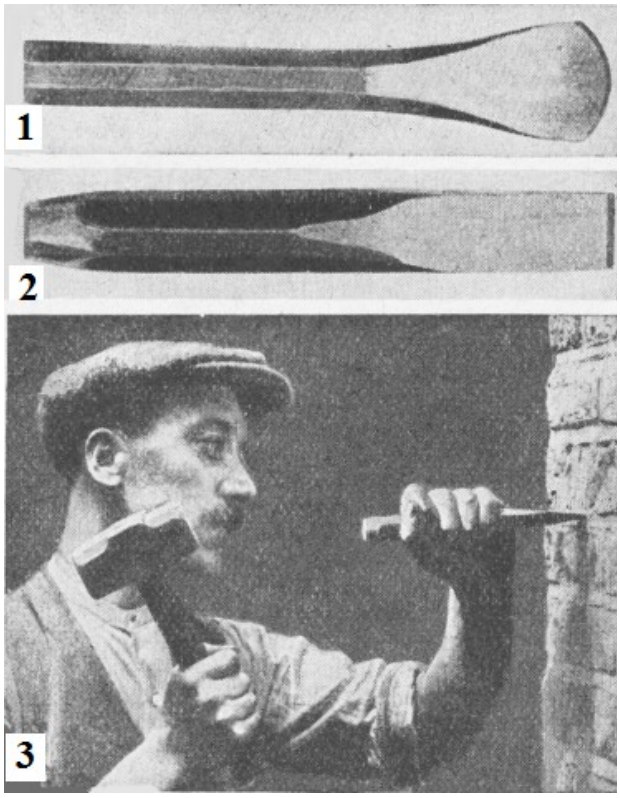
Ammoniated tincture of quinine is often taken at this time in tablets or a mixture, such as this: ammoniated tincture of quinine, 6 drams; tincture of orange, 3 drams; glycerin, 4 drams; chloroform water to 6 oz. Take a tablespoonful in water four times daily. Cinnamon essence and spirit of camphor are also used, about 15 drops of either on sugar. Carbolised smelling salts may be inhaled, or pinol, eucalyptus, or menthol. The oils may be inhaled from the bottle, dropped on a handkerchief, or from steaming water. If the throat is sore a gargle of steel drops, 20 minims to 1 oz. water, or a weak antiseptic solution, e.g. permanganate of potash, should be used.

The diet should be light and easily digested. If the bowels are constipated give 2 grains of calomel, followed by 2 drams of Epsom salts in the morning. When the cold has passed off, Easton's syrup in ½ dram doses, or the compound syrup of hypophosphites in dram doses, could be taken for a week or two. *See* Catarrh; Cod Liver Oil; Cough; Friar's Balsam, etc.

COLD CHISEL. The name cold chisel is applied to all kinds of metal cutting and chipping chisels, which are used for cutting cold metal, but have other applications in the house. The cheapest and commonest type is a round steel bar flattened and sharpened at one end. Such a tool is only fit for use as a case opener, or for breaking down old brickwork.

Those which are of real use to the home worker are the flat chipping chisels, in three sizes, 6 in. long by ⅜ in. wide, 8 in. long by ¾ in. wide, and 18 in. long by 1 in. wide. The first are for small work in brass, copper, or thin sheet-iron. The intermediate size is for such jobs as cutting sheet-iron and chipping off the projecting ends of bolts. The large size is for cutting brickwork and all kinds of demolition work. A 6 in. cross cut, a 5 in. diamond point, and a 4 in. half-round will all be found worth their trifling cost.

The chisels must be kept sharp by grinding the cutting edges. For very fine work they can be sharpened on an oilstone in the same way as carpenters' chisels. Bricklayers' chisels are ground rather finer and thinner than those for metal cutting. A round-ended chisel is handy for cutting corrugated iron. The diamond-point chisels are useful for chipping lines on metal and squaring up corners, and the half-round for chipping out screws or bolts that have broken off in their holes, and for shaping curved surfaces. A wise precaution is to grind off the ragged ends that form on the head of the chisel after use. See Chisel.



Cold Chisel.
1. Round-ended chisel for cutting corru-gated iron.
2. Ordinary type of cold chisel; and,
3. how it should be held for cutting brickwork.

COLD CREAM. As a toilet requisite cold cream is used for softening and cooling the skin after sunburn, as a cleansing cream, to relieve harshness of the skin, etc. It may be obtained by asking a chemist for the official ointment of rose water. The usual foundations for cold cream are either white vaseline, benzoated lard or white wax. *See* Beauty Culture; Skin.

COLD FRAME. Frames as used by gardeners for the growth and protection of certain plants and fruits are known as hot or cold, according to whether they are heated or not. *See* Cucumber; Frame.

COLD MEAT: Useful Hints. The remains of different kinds of meat can sometimes advantageously be made up together. For instance, veal is improved if combined for a made-up dish with a little cold ham or bacon; mutton and rabbit combine well, and poultry combines with ham or veal. An underdone joint can be reheated and served in the same way as a freshly baked joint if it is covered with mashed potatoes and placed for half an hour in a quick oven. Beef stands being recooked better than any other meat, and veal can be made into good entrée dishes. Boiled rice is served with mince and curries, and sippets of toast are arranged round dishes of hashed meat.

A joint of meat can be used down to the last. The bones should be scraped of all the meat that remains, and this should be minced. Soak some slices of bread in cold milk and let them stand for an hour. Whisk the bread and add the mince and season well. This mixture can be used to stuff tomatoes, to fill scooped-out baked potatoes, to add to omelettes and scrambled eggs. The bones should then be put in the stock-pot and used for soup. The bones of poultry or game can be devilled.

Savoury Puddings. Cold beef or mutton can be utilised for savoury meat puddings. A batter is made from potatoes, boiled, then rubbed through a colander, and beaten well with two eggs, a dessertspoonful of butter, and sufficient milk to make them into a batter consistency. This potato batter should be spread on a baking-dish and slices of meat placed over. These are covered with a layer of batter and the dish is baked for about an hour.

A steamed pudding is made in the following way. Soak pieces of stale bread in milk and strain from the liquid. Beat up the bread with an egg and a dessertspoonful of butter and stir over gentle heat until the mixture stiffens. Allow it to cool. Add seasoning, a sprinkling of mixed herbs, and a spoonful each of tomato ketchup and mushroom ketchup. Add the meat, minced finely, and mix well. Turn into a buttered basin and steam for about two hours. Serve with thick, brown gravy.

A pie is made from cold meat, macaroni, and pastry. A pie-dish should be lined with pastry and filled with a mixture of minced meat, oooked macaroni, and seasoning. Pour over a little white sauce and cover with pastry. Bake in a moderate oven for 45 min.

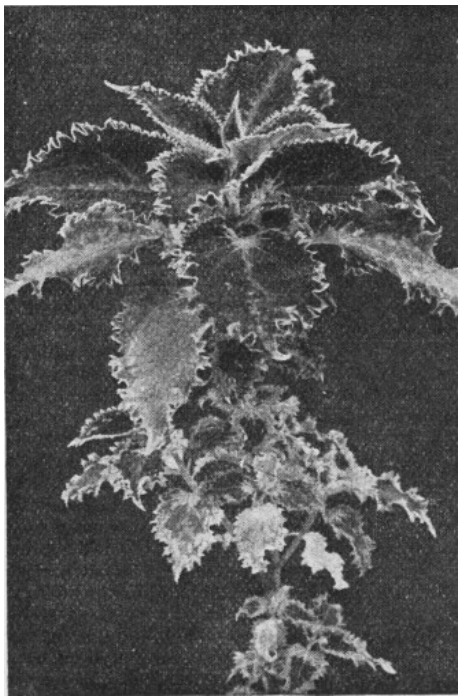
Another form of savoury pie is made by mincing the meat, seasoning it well, and placing it in a pie-dish with gravy or stock. Fry one or two onions and about four tomatoes, and cover the mince with alternate layers of onions and tomatoes. Cover the dish with mashed potatoes roughed up with a fork. Bake until the potatoes are nicely browned. *See* Casserole; Cornish Pasty; Rissole; Stew.

COLD PACK. Cover the bed with a waterproof sheet and over this lay one or two blankets. Wring a sheet out of cold water and spread it on the bed. Lay the patient stripped on this, and wrap it round him, quickly folding it around each leg separately and leaving the arms free. Then cover the patient with a couple of blankets and tuck them in about him. The pack may last 15 min. to an hour, and may be repeated several times a day. It is used in cases where the temperature remains obstinately high.

Cold Storage. *See* Refrigerator.

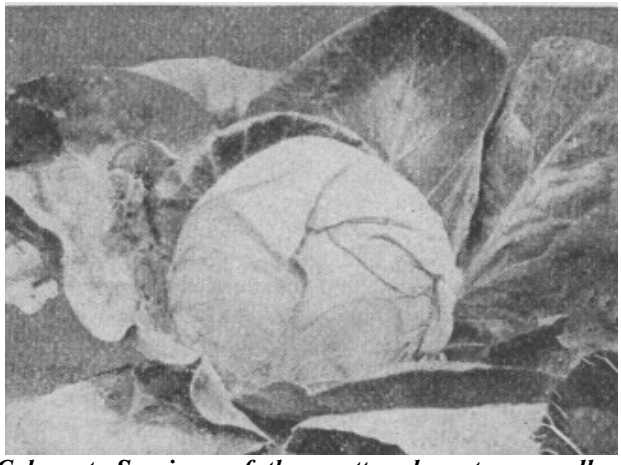
COLE. The local name of cole is applied to several members of the brassica or cabbage family, including kale, cottager's-kale, curly kale, borecole, kohl-rabi, and other greenstuffs. *See* Cabbage; Curly Kale, etc.

COLEUS. This greenhouse plant is grown for the sake of its brightly coloured leaves in the greenhouse in summer. It is usually treated as a half-hardy annual and raised fresh each year from seeds sown in warmth in February. Coleus can also be increased by cuttings taken from the old plants in spring or summer. Coleus thyrsoideus, which bears blue flowers in winter, is increased by cuttings inserted in a propagating case in early spring.



Coleus. Brightly coloured foliage of one of the varieties of the handsome greenhouse plant.

COLEWORT. This useful little autumn cabbage is raised from seeds sown out of doors in May; the seedlings should be thinned to 10 in. apart, not transplanted. The rosette colewort and hardy green varieties are grown: the former is the favourite.



Colewort. Specimen of the rosette colewort, an excellent little autumn cabbage.

COLIC: Its Causes and Cure. The prominent symptoms of colic are severe griping pains over the centre of the abdomen, with flatulence, distension of the abdomen, and either constipation or diarrhoea. Eating overripe or unripe fruit, a chill, or neglect to keep the bowels regular, are the chief causes of the ailment. Acute indigestion from any source may be accompanied by the pains.

Where indigestible food is known to have been taken, from one to two tablespoonfuls of castor oil should be given to clear out the intestine. To check the pain, 10 to 15 drops of tincture of opium may be mixed with the oil. Locally, a hot-water bottle applied to the abdomen while the patient lies on his side in bed is helpful in getting rid of the flatulence and relieves the pain. The diet should be entirely milky until the attack has subsided, and afterwards for a time the total amount of food taken should be reduced, and all indi-gestible articles as well as coarse vegetables should be forbidden. When flatulence is a prominent symptom, this mixture is useful, taking the 1/6 part three times a day:

Tincture of ginger	1 dram
Aromatic spirits of ammonia	2 drams
Spirit of chloroform	2 drams
Cinnamon-water	6 oz.

When the cause of the colic is not clear, or if there is vomiting or the patient looks ill, opening medicine should not be given without medical advice. An enema will be safer.

With infants and children severe colic may be brought on by such widely differing causes as improper feeding, want of cleanliness in the feeding bottles, sudden changes in the temperature, or exposure to chill. The patient should be kept thoroughly warm by being wrapped in blankets with a protected hot-water bag at the feet. A turpentine stupe, made by sprinkling a cloth wrung out in very hot water with a few drops of turpentine and placed over the abdomen, usually eases the pain. Teaspoonfuls of hot water may be given.

Colic in an infant may be taken as a sure sign that something is wrong with its feeding mixtures. The milk may be too rich, and when diluted with whey or barley water all tendency to colic may pass off.

COLITIS: Its Treatment. Inflammation of the colon, the large intestine, is termed colitis, and is of three chief types, namely, simple, mucous, and ulcerative.

The first of these comes on suddenly with severe pain in the abdomen, diarrhoea, perhaps vomiting, cramp in the calves, sometimes slight fever, and considerable mental and physical depression. Generally the attack is comparatively mild, but occasionally the diarrhoea is severe and exhausting. The treatment is to put the patient to bed between hot blankets and apply hot-water bottles or hot poultices to the abdomen. The patient should be kept on a milk diet chiefly while the attack lasts. The milk is best taken cold and should be sipped. Whey, milk, and isinglass, or white of egg beaten up, may also be given. To check the diarrhoea, give three minim doses of strong spirit of camphor every 10 min. for an hour.

In mucous or membranous colitis, large shreds or pieces of membrane may be passed by the bowel, and there may be much pain, with symptoms of indigestion and constipation with flatulence. The disease is a very chronic one, and associated with hysteria or neurasthenia, but there may be a tumour or other condition obstructing the bowel. It is therefore desirable that the patient should be overhauled by a physician at the start.

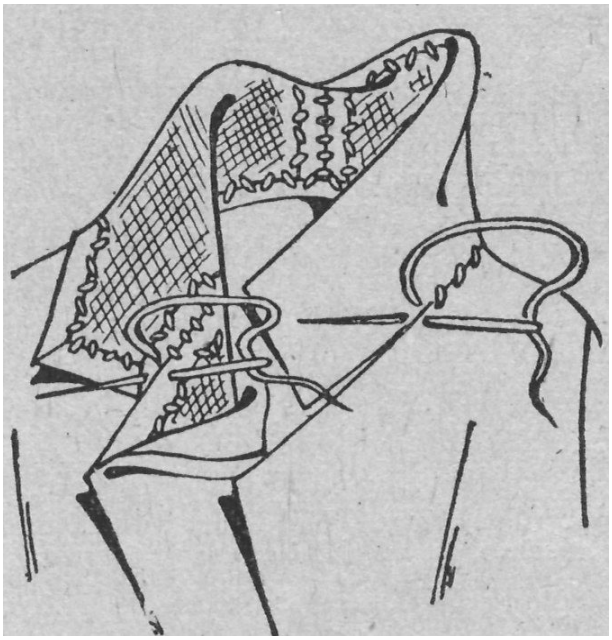
Ulcerative colitis is inflammation of the bowel combined with the presence of ulcers, some of these cases being really dysentery. The symptoms are first collicky pains in the abdomen, with attacks of severe diarrhoea often alternating with periods of constipation. Blood and some mucus are commonly passed. Vomiting is often very severe. Keep the patient in bed, apply cloths wrung out of hot water to the abdomen, and send immediately for the doctor. *See* Dysentery.

COLLAR: How to Stitch. Collars, unless of lace or net, are mostly cut in double material, and if made in heavy material for outdoor garments should be interlined with canvas.

In the case of a roll-over collar, the outer or under section is slightly smaller than the inner section, and in any collar the canvas interlining should be slightly smaller than the material outer section.

To make a collar of this heavier type, tack the canvas to the wrong side of the outer section and catch the material edges over to the canvas; then hem the collar over the neck of the coat, unless it is one of the long roll shape. In this case the neck edge of the collar is left unneatened, and the neck edge of the coat hemmed over it. Finally the linen is covered with the inner

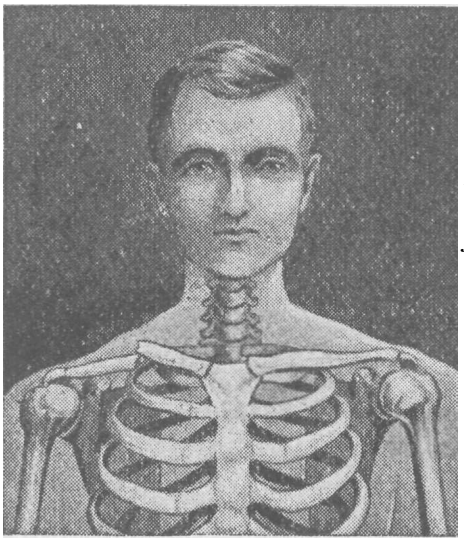
section of material, or with satin, velvet, etc.



Collar. Diagram showing how the collar is stitched to the neck and revers of a coat.

Soft collars are more simply made. They may be strengthened by an interlining, if necessary, To make one, join the edges on the wrong side, leaving the neck edge, turn over, and, if the collar is detachable, sew a narrow binding along the side left open. *See* Crochet; Linen, etc.

COLLARBONE or Clavicle. The collarbone runs from the shoulder to the top of the breastbone. It is frequently fractured, in children as well as adults, and this is usually due to a fall on the shoulder or the out-stretched hand. It may also be dislocated at either extremity, more commonly at the shoulder. In fracture the whole shoulder appears flattened, the arm is held close to the side, and the patient usually supports the elbow of the injured arm in the palm of his other hand. In order to relieve the tension the sufferer frequently bends his head towards the injured side.



Collarbone. Diagram showing a fracture of the clavicle.

First aid consists in placing a considerable pad in the armpit on the injured side, and then supporting the limb with a greater arm sling, except that here the lower end, instead of being laid over the injured shoulder, is passed through the armpit below the pad, and the two ends are knotted behind. The elbow is drawn well forward, and is held there by the point of the bandage, which is brought round it and pinned off. A narrow fold bandage is then tied round the body and the affected arm just above the elbow, with the object of levering the shoulder outward. Apart from apparatus, the patient may be kept flat on his back on a hard mattress without a pillow, till seen by the doctor. Some deformity usually remains after most fractures of the collarbone. *See* Bandage; First Aid.

COLLAR BOX. Collar boxes, which may be obtained or made in, a variety of shapes, rectangular, square or circular, are made of leather, or some kind of wood. A suitable size for a rectangular box is 1ft. 6 in. by 10 ½ in. by 4 ½ in., but these measurements may be varied.

For a really nice article hardwood should be selected. Mahogany, if chosen, will look well all plain with a full polish, or may be inlaid with satinwood banding, box, holly, and ebony lines, or a little coloured inlay in centre only. Walnut takes a waxed finish well, and may have inlaid ebony lines, or a little grey-wood with ebony lines may be introduced in tablet form. Oak may be either fumigated or full-polished after staining to a nut-brown colour, if to be kept plain. Rosewood may carry mahogany, satinwood, and ebony inlay.

Making a start with the box frame, this will take two pieces 1 ft. 4 in. by 3 ¾ in., and two pieces 9½ in. by 3 ¾ in., the material used finishing ⅜ in. thick. In best style they can be secret-dovetailed together, or may be lap-dovetailed together. In a simpler way the sides may be housed into front and back (Fig 3), or, again, they may be mitre-halved together and stiffened by the neatest possible rounded and glued slip in the angle. The bottom may be ¼ in. thickness, cut to a size to project ¼ in. all round, this portion being rounded and the bottom screwed up to under edge of sides with small brass screws. For the moulded effects shown at Fig. 2, a ⅜ in. section can be mitred round a flush-finished bottom. If the moulded front of box is preferred, a ⅜ in. section kept as flat as possible can be mitred round, glued, and panel-pinned on. The lower length of mould beading upon the bottom will be cut sufficiently wide to finish flush.

The lid, if to be jointed up, may be tongued together to finish 1 ft. 6 in. by 10½ in by ⅜ in thick. As shown at Fig. 1, it is in two parts, opening out left and right, the projection being a little more over sides than at front or back. The edges may be kept square, but will be improved by thumb moulding, or to an ovolo or ogee section. The lids are hinged on with brass butts (Fig. 2). The face treatment of lid in Fig. 1 may be

(Continued in page 501)

COLLAR BOX

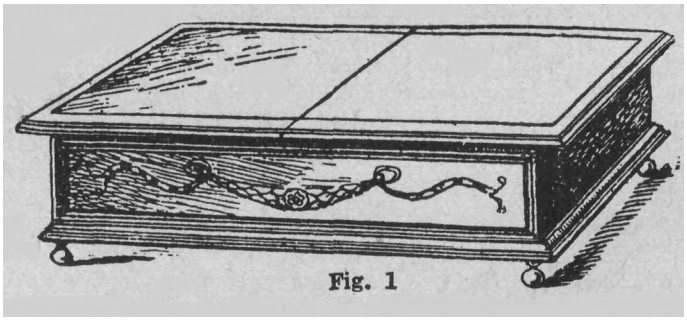


Fig. 1

Collar Box. Fig. 1. Useful wooden collar box, instructions for making which are given in the accompanying text.

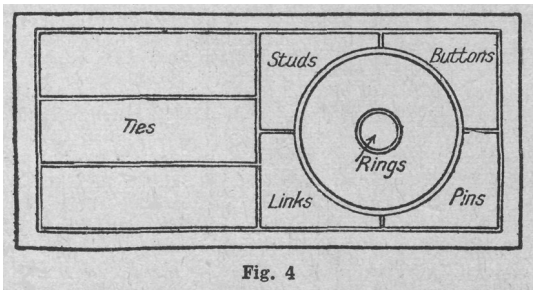


Fig. 4

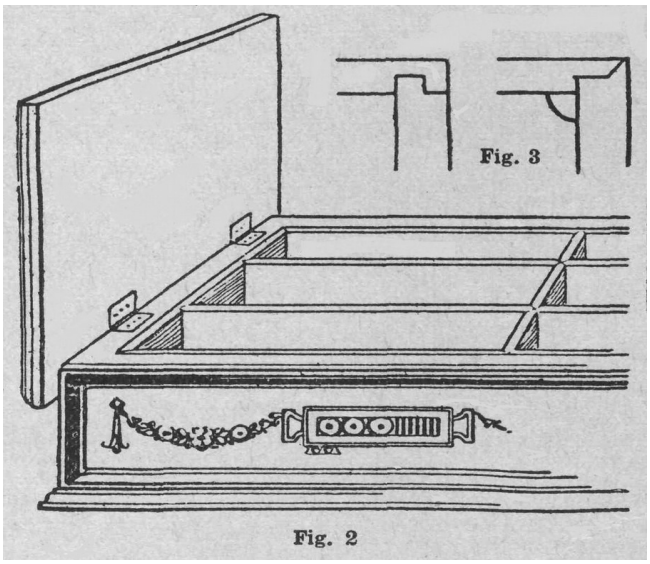


Fig. 3

Fig. 2

Figs. 2-7. Diagrams showing how the box can be made, with alternative designs for the lid. (By arrangement with Evans Bros. Ltd., London)

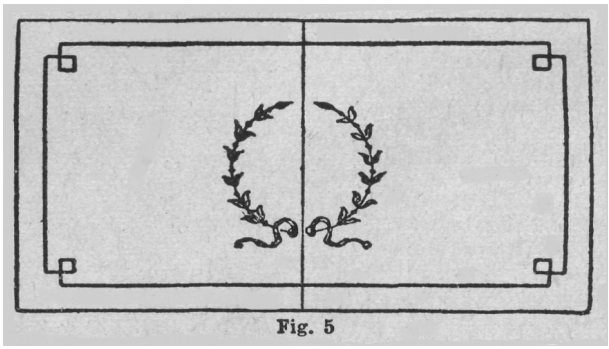


Fig. 5

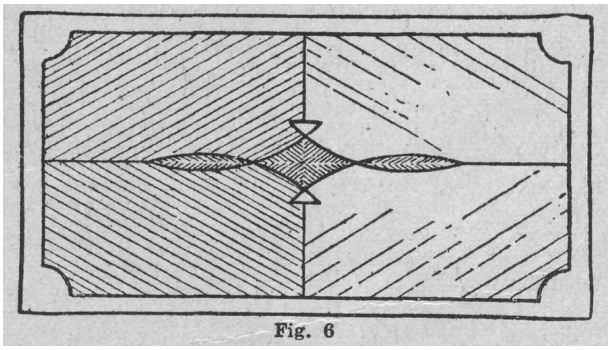


Fig. 6

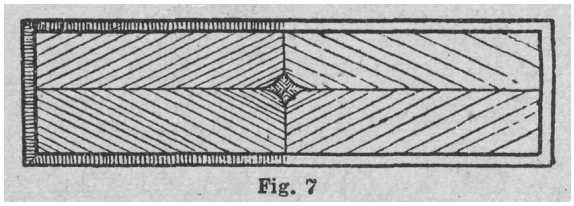


Fig. 7

either an inlaid line or banding; but if something better is preferred, Fig. 5 may serve as a suggestion, showing an inlaid line round, with broken key corners, and a central wreath inlaid equally each side of the meeting edges of lids. Such a wreath could have the stem in brown and leaves in green, with berries in red, and the knotted ribbon in blue.

The inlaid front (Fig. 1) might also be made in colours to match the wreath. An alternative treatment for the front is seen at Fig. 2, and on a birch or satinwood ground such detail could be painted in oil colour, mixed with gold size, which is quick drying in its action and useful to those who are clever with the brush. The ulterior fitting of Fig. 2, with three long and three square divisions, will be handy for gloves, ties, handkerchiefs, mufflers, etc., but does not provide for collars, and is for a smaller-sized box, which might then be made 6 in. deep and fitted with a lift-out tray.

The arrangement indicated at Fig. 4 works out very usefully, and is comprehensive. The lining can be of ⅛ in. thickness., cleaned up and V-grooved together and polished. The circular portion can be of knife-cut veneer, steamed or soaked in hot water and carefully bent and glued round a core of at least 6 in. diameter, such as a straight-sided flower-pot, or even the domestic cake tin. This part could also be made of stout bendable cardboard (two layers of 1/16 in. thick will do), glued together and covered with thin silk, the remainder of the interior being finished to match.

In a smaller box a single lid only may be desired, and, in an endeavour to make it look as well as possible, treat-ment may follow the method suggested at Fig. 6. This shows quadrant corners to a cross-banded surround, and the panel quartered up in oak, walnut, mahogany, or satinwood. The central device, neatly lined in, also affords a chance for careful quartered filling. All four sides can be finished as at Fig. 7. The small brass ball feet can be screwed into blocks glued under the bottom, and will add lightness to the general effect.

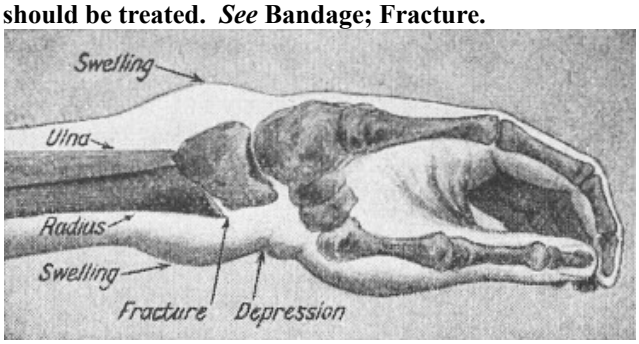
COLLECTING. The collecting of articles which are rare or noteworthy for their age or beauty, or both, is a hobby which is greatly increasing in popularity. Many make collections of china or furniture, while other articles collected include books, brass ware, coins, etchings, glass, miniatures, and silver. Another class of collectors go to nature and make collections of beetles or birds' eggs or butterflies. Some of the collections, e.g. china and birds' eggs, are often kept in special cabinets. *See* Antiques; Birds' Eggs; Brass; Butterfly; Cabinet; Chair; Coins; Glass, etc.

COLLEGE CREAM. Make some cheese pastry, a few hours before it is required, using 2 oz. each of flour and butter, 1 oz. cheese, the yolk of an egg, and a little salt and cayenne. Mix the cheese and flour, then lightly rub in the butter; season the mixture well, and add the beaten yolk of egg and enough water to make a stiff paste. Roll it out ¼ in. thick and stamp it into rounds with a sherry glass. Bake these carefully for about 8 to 10 min. in a moderate oven, and let them cool. Whip one gill of cream till it just hangs on the whisk, add 2 table spoonfuls grated Parmesan cheese, and season the mixture with salt and cayenne. Then heap it up on the cold cheese biscuits.

COLLEGE PUDDING. Mix ½ lb. fresh white breadcrumbs with 3 oz sugar, 3 oz. chopped suet, 3 oz. sultanas, or currants and sultanas mixed, ½ oz. chopped peel, a good dust of powdered spice, and a small saltspoonful of salt. Beat an egg to a froth, add it to 1 gill of milk, and stir it well into all the other ingredients. Turn the mixture into a thickly greased pudding basin, twist a piece of greased paper over the top, and steam the pudding for 3½ hours. Then turn it out and serve it with sweet melted butter sauce. If liked, chopped raisins, dates or figs can be used instead of the fruit named.

COLLES FRACTURE. This is a fracture of the lower end of the radius just above the wrist. It is one of the commonest fractures, especially among elderly women, and is usually caused by falling on the hand with the arm outstretched. Unless properly treated it may cause permanent deformity of the wrist and some loss of movement in the joint.

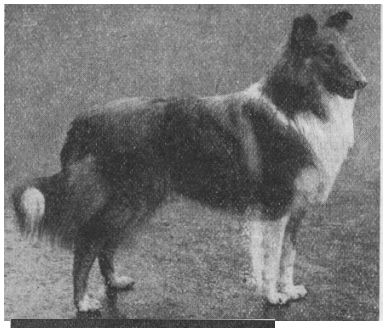
First aid consists in taking two splints reaching from the elbow to the finger-tips and padding them. The forearm is bent to a right angle at the elbow with the thumb pointing upwards, and the splints are applied on the back and front of the forearm. A narrow-fold triangular bandage or a handkerchief is used to fix the splints just in front of the elbow and another to fix them at the wrist. In applying the latter the middle is placed over the outer splint just above the thumb, the ends are crossed over the inner splint, brought forward below the thumb, and tied over the outer splint. The forearm is then supported by a greater arm sling. Probably some degree of shock will be present, and should be treated. *See* Bandage; Fracture.



Colles Fracture. Diagram showing the displacement of the broken portion of the radius immediately above the wrist.

COLLIE. Though the collie belongs chiefly to the farm, he is not infrequently compelled to put up with a more domestic existence; sometimes too, in establishments that are too small to set off his fine proportions.

The collie is 22 in. to 24 in. high at the shoulders, with a weight between 45 lb, and 65 lb. The head is flat, wide between the small, semi-erect ears, tapering to the eyes and thence to the always black nose. The long, dense coat is harsh to the touch, but beneath it is a soft, furry undercoat. The conspicuous feature of the collie is the heavy mane, continued as a frill over the shoulders. The muscular legs are all well feathered, as is the long tail, usually carried low. *See* Dog.



Collie. Champion rough collie, a splendid example of the breed.

COLLINSIA.

This is a pretty, easily grown hardy annual, 10 inches high. Seeds are sown out of doors in March-April, where the plants are to bloom in summer. Favourite sorts are bicolor, lilac rose and white, and candidissima, white.



Collinsia. Lilac and white flowers of Collinsia bicolor, a hardy annual.

COLLODION. When it is wished to spread a protective film over an injured skin surface collodion is often used by doctors. When it is applied the contained ether rapidly evaporates, leaving a smooth, glistening, hard, transparent surface, which prevents germs and other substances from reaching the wound. Collodion should not be used to cover a dirty or a discharging wound. New skin can be used in the same way as collodion. Collodium callosum is a preparation which may be used for dissolving warts or corns, and salicylic collodion can be used for the same purpose.

COLLOMIA. This showy hardy annual, about 10 inches high, is grown from seeds sown out of doors in spring where the plants will bloom in summer. Collomia coccinea is chiefly grown: it bears red flowers.

COLLOPS: How to Cook. Take 1 lb. raw lean topside of beef, or good steak, and mince it finely by hand, as a mincing-machine cuts it too small. Remove any fat or skin, replacing some of the former after chopping it finely. Melt about 1½ oz. good beef dripping or butter in a saucepan, and fry in it 3 teaspoonfuls of very finely-chopped onion. Stir in ½ oz. flour and then the beef.

Stir it over a moderately sharp heat till the beef changes from red to a brownish tint, then pour in ½ pint stock.

Stir over a gentle heat until the gravy thickens, then add a dust of seasoning and simmer it all till the meat is tender— probably for about 30 min. If it boils the meat will be leathery and tasteless. Add 2 oz. breadcrumbs a few minutes before serving, to absorb the grease. Serve the collops with a border of sippets of toast, or croûtons.

Mutton collops may be made with about 1 lb. cooked mutton. Cut it into rounds, about ½ in. thick and 2 in. in diameter. Chop one small onion and mix with it ½ teaspoonful powdered herbs, a pinch of powdered mace and salt and pepper. Spread this mixture on one side of each collop and let them stand for about an hour, in order to flavour them. After that time fry them quickly in a saucepan in about 2 oz. of clean dripping, turning them with the savoury mixture downward.

Then take them out of the saucepan and into it stir 2 teaspoonfuls of flour, browning this carefully. Any fat not absorbed by the flour should be poured off. Stir in ½ pint of good stock and allow it to boil. Simmer the sauce for 10 min., attending to the skimming and seasoning, and strain it round the collops after arranging them neatly on a hot dish. This is sufficient for three or four persons.

COLLYRIUM. An eye lotion which is termed a collyrium may consist of solutions of boracic acid, zinc sulphate, permanganate of potash, and other antiseptics. The solution should be warm and may be applied by a swab of cotton wool or an eye-bath; or a few drops may be put into the eye. The following would serve if mixed with an equal quantity of warm water: Boracic acid, 20 grains, and distilled water, 1 oz.; or boracic acid, 15 grains, zinc sulphate, 1 grain, distilled water 1 oz.

COLOCYNTH. Colocynth is a fruit also known as bitter apple. It is a drastic cathartic, but in small doses it is frequently given in aperient pills. It may be used as colocynth pill or the colocynth and hyoscyamus pill, the dose of each being 4 to 8 grains. Hamilton's pill resembles the latter in its medicinal action.

COLOUR SCHEMES FOR THE HOME

How to Achieve Pleasing Effects in the Various Rooms

Other articles in this Encyclopedia dealing with the subject include Decoration; Drawing Room; Nursery; etc. See also Carpet; Curtain; Cushion

The primary colours are red, yellow, and blue, which in combination give black, if they are exactly balanced. The secondary colours consist of a mixture of two primary colours, varying according to the proportion of each. A mixture of red and yellow gives orange. Yellow and blue give green; blue and red purple.

There are innumerable tones in these colours,

according to the proportion in which the two primary colours are mixed. The purples will vary from the red purple of the Orleans plum, through amethyst to the mauve of wistaria. Similarly with orange and with green. Tertiary colours are compounded of two secondary colours.

Complementary colours are those which complete one another, i.e. the pigments when mixed with one another make black. Thus red is the complement of green, yellow is the complement of purple, and blue the complement of orange. The various shades of grey are, if the grey is pure, broken down from black by the addition of white. Mixtures of the secondary colours give a range of greys.

Harmonious Effects. Where rooms open out of the same hall it is well to remember that the hall should form a kind of bridge between them. A grey hall, with rooms opening out of it, in which a range of colours from pinks (pink is only insipid when badly selected), reddish purples, and blues are well blended and contrasted, makes a charming interior for those who have old china and Persian rugs for purposes of decoration and relief. A hall with black and white tiled floor, black paint and grey walls, will allow of vivid touches of colour in curtains, etc., which notes of colour are repeated in the rooms opening off it. Another device is to choose the same colour for the carpets or flooring throughout, and to build up harmonious colour schemes on that.

Each room will then have a dominant colour. The dominant colour is the one which draws immediate attention, and not necessarily that which covers the largest surface. In a lounge, for instance, whose general colouring is fairly soft—browns, fawns, pale yellows—the dominant note might be struck by a vivid red-and-gold book table, the same note being picked up in appliqué (q.v.) on curtains, also on the mirror-frame and one cushion. In a small room the dominant colour note may be provided by a painting or the tiles of the fireplace. Nevertheless, colour schemes to-day are on the whole very gentle, suggesting a return to Georgian or Victorian modes.

Psychological Effect of Colours

In selecting harmonious schemes it should also be borne in mind that blues, purples, and greys are soothing, orange and red stimulating, light warm pinks and also yellows give an effect of sunshine in dark rooms. Green should only be employed in sunny rooms, as it absorbs instead of reflects the light. These remarks apply to large surfaces treated with these colours, as practically any colour can be utilised merely as colour accents in right relation to various schemes; a cool scheme requiring certain warmer notes to prevent it from being depressing, a warm scheme requiring to be toned down by a neutral shade to prevent it from being either garish or irritating. It may also be noted that no colour is successfully used unless the right materials are selected for its expression. Thus certain shades are beautiful in glossy surfaced fabric, which are oppressive or dull in a matt surfaced one; while in every colour the range of shades makes it possible for certain combinations— say green and purple—to be either harmonious or crude and unpleasant.

Colour Details. Blue is an instance of a colour the use of which is sometimes misunderstood. Wedgwood is a beautiful shade to combine with purples and also with pinks which have a tinge of mauve in their composition. In pale shades Wedgwood blue can be used in a sunny room for the walls and also for the ceiling. It is charming with ivory paint or with grey woodwork picked out with lines of metallic silver paint. The tulip colourings (except red) are exquisite against this shade of blue as a background. Greenish blues are useful as sharply decorative notes. Turquoise tiles or kingfisher blue cushions are points of interest in a neutral scheme.

Grey is a dignified colour for walls, but is depressing if carried over the ceiling. For a bedroom, grey, black and coral pinks are a good choice. In a sunny room the walls could be grey, paint black, and the furnishing fabrics could introduce the pinks with discretion, avoiding too much warmth; or for a room with a north aspect, walls and ceiling could be distempered a yellowish pink, which gives a beautiful sunny effect, and the grey introduced into the furnishing details with a patterned cretonne in grey, deeper pink, yellow and black. For this scheme the woodwork could be painted grey with skirting board, window frame and architrave of the door in black or a deeper shade of grey.

Backgrounds for Oak and Walnut

Yellowish-pink is also excellent with browns, and may be most successfully used for a ceiling in a scheme in which brown panelling and oak parquet flooring are employed. Rose pink is good with dainty furniture, especially with panel mouldings and woodwork in ivory paint. Pinks are successful in distempers, and their gradations of colourings are excellent.

Light apple green is right for walls in a room with walnut furniture in the style of Queen Anne, the woodwork and mouldings picked out in gold and the ceiling enriched with a dull gold paper. Pinky-mauve and plum colour are the notes to emphasise in colour accessories with such a green. Malachite green is a good choice for woodwork with apricot tinted walls, and mauve shades introduced into loose covers or curtains.

Red definitely needs most careful treatment. In a sunny room indiscreet use would be most irritating: even in a room with a cold aspect bright red is only right for a colour note. A claret shade may be beautiful in rich materials for upholstery, especially for winter use in a room with stone coloured walls.

Orange and brown are a good combination with cream or golden yellows. Such a scheme will probably require cooling with the judicious use of green or blue. A yellowish orange is best with lighter browns, and a reddish orange with very dark browns. Mahogany has so much red in it that it is better with a yellowish orange—suggesting the colour seen in Sheraton inlaid

furniture. Black is too violent a contrast to be used in a mass with orange, but is valuable as a colour accent, as in a cretonne or other patterned fabric into which yellowish-pink, soft blues and mauve may be introduced.

Uses of Colour. Defects in the shapes of rooms can be to some extent corrected by the proper use of colour. The ceiling may be washed in a paler shade toning into the walls if the room is a low one. Pale grey on walls and a cloudy blue for a ceiling also give height. A box-like room, too high for its breadth, can be made to appear lower by having the ceiling painted with a design in colours or by being treated with a colour darker in tone than the walls or carpet of the room. With ivory panelled walls cobalt blue is a fine ceiling colour, either plain, slatted with ivory lincrusta or wood, or painted with clouds or stars.

Glowing sunshine can be simulated in a dark room by a wallpaper which graduates upwards from deep orange-yellow to palest primrose, with paintwork in umber scumbled over a gold undercoat and then varnished. Happy schemes—particularly for bedrooms—may be evolved by taking a flower as a pattern for each room.

Aids to Selection. Before deciding on colours for a decorative scheme a good idea is to lay out on a table a number of small samples of shades of paints, distempers, etc., and also of colours approximating the ideas for furnishing fabrics. Bearing in mind the exigencies of existing carpets and furniture, place the colours fancied next to each other, altering the various shades until the harmonious effect required is obtained. Then paste those decided upon for each room, grouped together on a piece of white paper, and a workable guide is evolved. Such a method is exemplified in the following colour schemes suggested by Waring and Gillow. Taste and ingenuity are more necessary now that the violent contrasts popular a few years ago have been toned down.

The Dining Room. The foundation of the scheme is a modern flecked carpet: the fleck might be repeated, according to taste, in a cushion or lampshade. While the traditional advice, that green should be used chiefly for sunny rooms., still holds good, there is a growing fashion for green in almost any room, if the shade is discreetly chosen. So, for walls, green is recommended. A slight contrast is advisable for the woodwork; a somewhat softer green would be preferable. Green occurs again in the damask curtains, varied, perhaps, with gold patterning and a striped, or even braided, pelmet. For ceiling and frieze a simple wash of fairly deep cream colour could scarcely be bettered. Since green predominates in this scheme, excessively dark furniture should be avoided. Limed oak is popular nowadays for simply-made chairs and tables, but walnut is equally harmonious.

Lounge or Lounge Hall. This room, large or small, should be coloured in such a way as to give it some connecting link with the adjacent rooms. A gold or metallic motif would thus link a lounge hall with the above dining room; or possibly a continuation of the carpet fleck in the lounge curtains. More typical of present tendencies, however, is a floral damask for lounge curtains, supported by a smaller-flowered repp for chair covers with a set design for settees. The heavy floral effect is set off with a light copper-coloured carpet. Wallpaper is white, illuminated by a fairly elaborate silvery pattern.

The Sitting Room. Colour schemes for sitting rooms are, of course, much the same as for the lounge above, there being no essential difference between a sitting-room and a lounge other than in implications of size and atmosphere. The general scheme for a fairly large sitting-room would, however be less rich than the lounge scheme, with rather more "streamlining" in the furniture, and more unstained or uncovered wood. Ideas might well be borrowed from such a scheme as the dining room outlined above. Light woods rule modern sitting-room colour schemes to some extent; but a jet black grand piano is never out of place, while a walnut one harmonizes admirably with limed oak tables, etc., and with pale-stained plywood or "units." Fawns, biscuit, copper and flecks predominate in carpet colours.

The Bedroom. The latest colour schemes for bedrooms aim at various depths of the same dominant colour rather than at contrasts. Grey for the woodwork of walls and furniture has been popular for some years now, and seems to have come to stay. Bluish-grey wallpaper with a faint pattern; a soft rose carpet; a paler shade of silk or damask for curtains and chair, relieved by a small interesting motif; a mouse-coloured bedspread, quilted in pink; and paintwork a shade lighter than the paper—these combine to give a "restful" effect which used to be considered the monopoly of green.

Colour schemes for the nursery will be found under that heading, where various methods of suitable treatment are discussed both for day and night nurseries.

COLOUR BLINDNESS. The commonest variety ol colour blindness is that in which the person is unable to distinguish red and green. He confuses these colours with grey, yellow and blue. This form of colour blindness is very important, as it disqualifies a man from service on the sea or on a railway, when duties involve the recognition of these colours. People who are blind to violet confuse purple, red, and orange. The test may be performed by placing skeins of wool of varying shades of different colours before the person being examined, and asking him to match samples, usually light green, pink, and red.

Acquired colour blindness may be due to poisoning by alcohol or tobacco, or both, or to atrophy of the optic nerve. There is no cure for the congenital complaint, but something may be done for the acquired

form.

Colour blindness may vary from a slight difficulty about one colour combination up to inability to see anything but shades of black and white, but this latter condition is rare. The abnormality is commonest among men.

COLOUR PHOTOGRAPHY FOR THE AMATEUR

How to Obtain Naturalistic Results by Transparencies

Other articles in this work for the amateur photographer include Camera; Dark Room; Developing; Exposure, as well as the main article on Photography.

Considerable progress has been made recently in processes for producing photographs (prints on paper) in natural colours, but these methods are still much too complicated for the average amateur, since they involve the preparation of three separate prints (red, yellow, and blue) and the combination of these three in exact register. There are, however, several processes which are almost as easy as ordinary photography. The results differ from those of the latter in being transparencies on glass or film viewed by holding them up to the light, or shown on a screen by means of an optical lantern.

With some colour films it is just as simple to load the camera and make an exposure as it is with monochrome, no external filters or modifications to the camera being required, and in some cases the purchase price of the film includes the charge for processing.

The Two Principles. Colour transparencies can be made by either of two methods, one of which is known as the "additive," and the other the "subtractive" process.

If the visible spectrum is divided into three approximately equal parts and the radiation in each portion is grouped together, red, green and blue lights are obtained. Obviously if the three resultant coloured lights are added together we can re-form white light, and this principle forms the basis of the additive process. To take a colour photograph by this method a special kind of plate is used, viz. one having a coating of extremely small transparent dots, or a fine mechanically printed colour pattern, red, blue and green in colour, made so that the mixture does not show any colour at all. These dots are really colour filters of microscopic size mingled in close juxtaposition, and are known as a mosaic screen. On this coating is a sensitive emulsion similar to that used for ordinary photography, and when the photograph is taken on this latter (through the coating of coloured dots) the result of special treatment is a picture in all the colours of the subject photographed.

The chief additive processes in colour photography are Dufaycolor, Finlaycolor and Lumière Filmcolor.

Whereas in additive colour photography we start with a dark screen and build up the picture by adding to it coloured light, in the subtractive process we start off with white light and remove from this light all the colours not actually required. Therefore the three negatives required must be exposed (either simultaneously or in rapid succession) through filters which will absorb from white light the unwanted rays and transmit the rest. These fillers are yellow (which absorbs blue), blue-green (which absorbs red), and magenta (which absorbs green).

In modern subtractive processes such as Kodachrome and the new Agfacolor, three colour-sensitized emulsions are coated on one support with the filter components sandwiched between, the combined thickness of the various layers being no more than that of ordinary roll-film, so that the rear image shall not be appreciably diffused by light scatter. This makes it possible to take colour photographs with one exposure in the same manner as for black and white.

Colour Films. There are now a few films available which can be used in almost any camera and do not require special filters. Of these Dufaycolor is supplied in sizes to fit all popular makes of cameras, Lumière Ultra-Rapid Filmcolor and Lumicolor are made in cut film and roll-film respectively. Kodachrome and Agfacolor have proved successful in 35-mm. film for miniature cameras, and neither requires external filters in daylight.

Exposures. Much greater accuracy of exposure is necessary in colour photography than in black and white, and the maker's instructions should be carefully observed and some form of exposure meter employed, the best results being obtained with the photo-electric type. As a rough guide to possible exposures, on a bright summer's day in direct sunshine, with a light-coloured subject, one can obtain sufficient exposure with a shutter speed of 1/50 sec. at f8.

The type of subject suitable for colour photographs is not always one containing brilliant colours of every shade. Just as the beauty of many black-and-white photographs lies in the contrast of the main subject against a subdued background, so a colour photograph, where the brilliance of the colour is confined to the principal theme, will present a colour contrast which is often more pleasing than an intricate mass of bright colour all over the picture.

The contrast in a colour photograph is not confined to lighting conditions, but includes change of colour, and where two entirely different colours of nearly the same depth of tone would present a flat subject in black and white, the difference in shade may produce great contrast in colour. However excellent colour films may be, they cannot yet cope with excessive lighting contrast. Note this when choosing a subject.

The amateur who is not excessively critical will find any of the well-known makes of colour-film excellent under most lighting conditions, but the discriminating worker will have to select subject matter with much greater care. Amongst the most common troubles experienced with colour films is a tendency for any

predominating colour covering a large portion of the picture to be present in small light portions of the subject. For instance, if a white cottage is photographed against a deep blue sky, the colour of the cottage may be shown as pale blue instead of white, light clothing on a figure against a bright background may disclose a pale shade similar to the background, while deep shadows are blue, as often in nature, although the film may exaggerate them.

In many subjects a flat front lighting that would be uninteresting in monochrome work is quite satisfactory in colour, but in order to obtain good roundness or third-dimensional tones the sun should be to one side of the camera and excessive shadow should be avoided. Pictures against the light are by no means impossible in colour, but they should not be attempted in very brilliant sunshine, the ideal time being when the sun is partially overcast with thin cloud.

Although colour filters are not necessary as a general rule in daylight exposures, special filters are sold for specific purposes and must be used with discretion. On no account should filters marketed for one colour film be employed on another.

Indoor Colour Work. Kodachrome film is supplied in two types: one for use in daylight, and another (Type A) balanced for artificial light. A filter can be used which will allow the latter to be employed in daylight.

Agfacolor provide a pale blue filter (No. 28) for use on special occasions when red and yellow light predominates, and a special filter (29B) for high altitudes. There is also a series of filters available for Dufaycolor, which embrace various forms of artificial light, but the amateur is recommended to become familiar with straightforward exposures before extending the work into special fields.

Indoor good colour results may be obtained with most forms of artificial light, including flash-bulbs. Kodachrome (Type A) in particular is exceedingly fast and may be exposed almost as a medium speed ordinary film. Lighting arrangements are slightly different from those usually employed for monochrome. Good flat lighting is advisable. Back lighting may be added to increase subject interest.

The best results, both in daylight and artificial light, are those where accuracy of exposure combined with suitable lighting brings colour values well within the latitude of the film, and a good exposure meter, preferably photo-electric cell type, is essential.

COLUMBINE. This is the popular name of aquilegia, one of the loveliest of hardy garden flowers. The new long-spurred varieties in many charming colours are far superior to the old short-spurred ones. Columbines thrive in ordinary soil, in sunshine or partial shade; they are grown from seeds sown in a box of soil in a frame in March-April, the seedlings being planted out of doors in summer, preferably where they are to remain. The final planting may, however, be done in October. After two, or possibly three, years the plants generally lose vigour and a fresh lot should be raised from seed. Several columbines are suitable for well drained loamy soil in the rock garden, e.g. alpina, blue, coerulea, blue and white, and glandulosa, blue and white.



Columbine. Flowers of the long-spurred columbine, a beautiful hardy garden flower. (Photo, Sutton & Sons)

COLZA OIL. Colza, or rapeseed, oil is the commercial name for oil obtained from brassica seeds. Its chief use is for illumination.

There are many qualities of colza oil and colour is the best indication of value, the more highly refined oils being of a very pale golden shade, as distinct from the dark brown colour of the crude product. The illuminating power of colza is not so great as that of paraflin or petroleum, but in practice it is found more econom-ical, being slower in burning.

Care should be taken to keep the oil in a clean vessel, as even small particles of foreign matter will cause the wick of the lamp to become clogged, and when this occurs the wick should be removed and cleansed, and a small lump of common salt put into the reservoir of the lamp. This will attract and hold foreign particles and prevent them reaching the wick. Should water become mixed with the oil it is removed by placing strips of gelatine to absorb it. The gelatine is not solvent in oil, and may be taken out, dried, and used again for a similar purpose.

COMA. Deep unconsciousness from which the patient cannot be aroused occurs in cases of severe head injuries, in apoplexy and heat stroke, in uraemia and diabetes, from poisons circulating in the blood, in narcotic poisoning, as from opium, alcohol, coal-gas, etc. after epileptic fits, and in many other conditions. Coma vigil is the name given to a condition which sometimes occurs in typhoid and typhus fevers, and in the typhoid state when the patient lies with his eyes half open and keeps on muttering to himself but is unconscious.

First-aid for persons found comatose is to send for

the doctor, loosen tight clothing, place the patient's head in the position in which his breathing appears to be easiest, take careful charge of any bottle or other receptacle which may have contained poison, and keep the patient warm. In heat stroke he should be moved to a cool, shady spot and douched with cold water. *See* Delirium; Sunstroke.

COMB: For the Hair. Dressing combs should not be too cheap, or the teeth will break readily: also roughness in finish irritates the scalp. The teeth should be of two different sizes, coarse at one end and fine at the other, and the comb should be discarded as soon as it becomes damaged. Many people who wash their brushes regularly are careless about their combs, which need periodical attention just as much. Special comb cleansers, consisting of an arrangement of threads which enter between the teeth and clear out the dirt collected at the roots of them, can be bought.

Real tortoiseshell combs, though most pleasant to use on account of their superior finish and smoothness, are expensive and need careful handling as they are easily broken. Tooth combs, which have very fine teeth set close together, are useful for cleansing the scalps of children, and must be kept scrupulously clean.

COMFORTER: For the Baby. The chief danger of the comforter is that it is liable to be soiled, and so infected with microbes, which produce indigestion and sometimes diarrhoea, inflammation of the mouth, and other diseases. Also, the comforter tends to spoil the shape of the mouth, and very often deforms the palate, with the result that the air passages of the nose are narrowed and the child becomes a mouth breather. A mother who gives a comforter to her baby (q.v.) may quiet the child for the time being, but the baby too often has to pay heavy penalties.

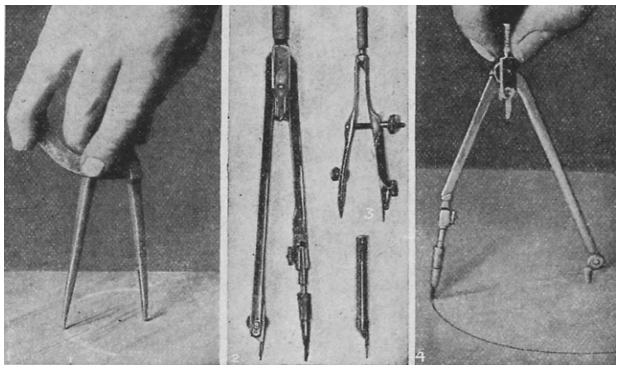


Commode. Semicircular example in satinwood, c. 1785.

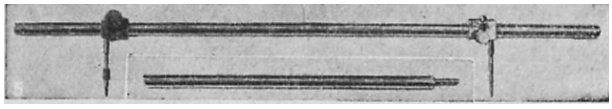
COMMODE. This word is used for a small sideboard. In another sense it means a box used for holding a chamber utensil and also a seating arrangement of that kind suitable for invalids. Of the sideboard known as the commode there exist very beautiful examples, some being associated with the name and work of Buhl. The finest were made towards the end of the 17th century in mahogany and in pine, often with marquetry of brass, ebony, mother-of-pearl, etc. In England commodes were made by the Adam brothers and their successors. Some of them are of satinwood, semicircular in shape, and are beautifully ornamented with medallions painted by Italian artists. See Buhl; Sideboard.

COMMUTATOR. The device known as a commutator forms part of an electric generator or motor, and is designed to convert an alternating into a continuous current. Commutators are found on any continuous current or direct current generator, or on any motor intended for use on a continuous current. *See* Dynamo; Motor.

COMPASSES. These are mathematical instruments used for drawing circles, or arcs of circles. Variations of this instrument are the chalk compasses used by teachers in schools and by scene painters and others, also the wing compasses employed in carpentry and for metal work. The Lancashire wing compasses, shown in Fig. 1, are provided with a quadrant or wing, and a thumb-screw which is tightened up to hold the legs rigid.



Compasses. Fig. 1. Lancashire wing compasses in use. Fig. 2. Six-in. compasses with pencil point. Fig. 3. Spring bow compasses with pen point; below, divider point. Fig. 4. How compasses should be held, with needle-point and pencil both upright. Fig. 5. Beam compass, used for circle; of large radius.



The compasses used in mechanical drawing are made in numerous patterns, priced from a few pence upwards. The amateur draughtsman will be wise to purchase a good quality instrument of moderate cost. Compasses with solid points should be rejected in favour of those with needle points. These have needles held in a clamp, and make only a very small hole in the drawing paper; if damaged the needles are easily replaced.

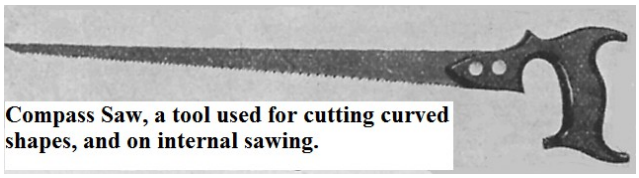
Essential features are rigidity, freedom of action at the joint, and all detachable parts secured with a clamping screw acting between two jaws and holding the removable part as in a vice. Other requirements

are a knee joint above the pen or pencil point, Fig. 4, and some means of adjusting the needle, as in all good drawing work the needle and the pen or pencil point must be vertical when drawing the lines. These characteristics are shown in the 6 in. compass illustrated in Fig. 2, with pen and pencil and divider points. Spring bow compasses, as shown in Fig. 3, are excellent for small work and to be preferred for circles up to 1¼ in. diameter.

Beam compasses are used for drawing large radius circles, such as occur in surveyors work or in laying out a garden plan. A typical set, pictured in Fig. 5, consists of a jointed metal beam 24 in. long in four sections, with pen and pencil points, two steel points, and a shouldered needle point. *See* Dividers; Drawing.

COMPASS SAW. For curved shapes the compass saw is invaluable. It is stronger than the keyhole saw, but can often be used when lock fitting or on any internal sawing where the curves are not too sharp.

When sawing a curved shape always take care to keep the saw blade at right angles to the face of the work, unless a bevelled edge is the objective. Work with a steady sawing stroke, avoiding heavy pressure on the teeth, or the saw will wander away from the line.



Compass Saw, a tool used for cutting curved shapes, and on internal sawing.

COMPENSATION: In Law. This term is sometimes used by laymen as synonymous with damages, but in fact the two are generally different. The word compensation is rightly applied to the money payable by an employer to a servant who has been injured by an accident arising out of and in the course of the employment. It is also used in its proper sense to describe the amount that must be paid to anyone whose land or building is compulsorily acquired by a public authority, with powers conferred by Act of Parliament to take property. *See* Accidents; Employer's Liability.

COMPLEXION: Its Care. This depends primarily on the state of the health. Some women naturally have a white, clear skin of a soft and delicate texture. Those who have not should pay attention first to digestion, for a sallow skin is often due to dyspepsia. An unnatural pallor may be due to anaemia or a poor circulation.

Those whose complexions are muddy or of too high a colour should carefully consider their diet, avoiding rich and highly seasoned dishes. Over-feeding is one of the commonest causes of skin blemishes and greasiness. Women with greasy skins have need of a good cleansing cream and a lotion which will stimulate the circulation, remove the grease from the surface of the sebaceous glands and leave the pores free.

Women with sensitive skins often find their complexions affected by sudden changes of temperature. Such skins are usually of the dry type, and require very pure emollients, and only mild astringents. The use of ice or a strong astringent to close the pores after washing is dangerous for this type of complexion, as such drastic treatment often results in small broken veins.

When washing the face, soft, warm water is necessary. If soap is used it must be of a pure superfatted variety and should be thoroughly sponged off before drying. The final sponge should be with cold water. Soap should only be used once a day, at bedtime; after drying, the complexion will be improved by the use of a good massage cream, in order to maintain the skin in a healthy condition and keep its transparent look. *See* Beauty Culture: Face; Powder; Skin; Soap.

COMPO: For Building. This is a mortar composed of Portland cement and sand, or a mortar containing a proportion of Portland cement in addition to the usual mixture of lime and sand. A sound compo mortar for general house-building purposes should contain: one part by measure, of grey lime (measured before being slaked) and one part by measure of Portland cement to seven parts by measure of clean sharp sand.

Owing to the extreme difference in the time taken by lime and cement in setting, special precautions have to be used in the mixing and using of compo. The lime and sand should be mixed and made up as mortar in advance in order to ensure that no hot, i.e. unslaked, particles of lime remain to expand in the finished work.

The proportion of cement is only added just before the compo mortar is required for use. Three pailfuls of lime mortar are taken from the heap, and to them one pailful of cement is added and well worked into the mass with a shovel. If necessary a little water is added. The compo mortar must be used immediately after mixing.

A wall laid in compo mortar hardens and dries quickly and attains a great proportion of its final strength very much sooner than a wall built with lime mortar. The shrinkage of the joints is not so great as with lime mortar alone. *See* Brick; Cement; Mortar; Plaster.

COMPOST: For Plants. This is the term applied to mixtures of soils used in the garden, or for potting purposes in frames or hot-houses. Compost may consist of two, three, or more of various ingredients necessary for the successful culture of the plants which are to derive their nourishment from it. Loam (pieces of old turf) forms the basis of nearly all potting composts. Other ingredients, such as leaf-mould, peat, and sand are added in proportions varying according to the needs of the plants.

COMPÔTE: In Cookery. This word is usually understood to mean a carefully prepared dish of fruits

stewed with syrup, but in a few instances it is applied to a rich variety of stew, such as a compote of pigeons or of plovers.

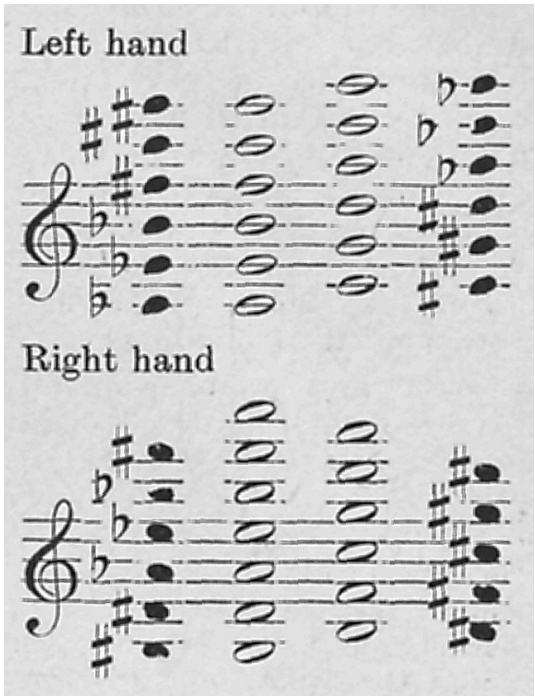
The secret of making good compôtes lies in stewing such fruits as gooseberries, cherries, and currants in a casserole in the oven before using them. Dried fruits can be used if, after washing, they are soaked overnight and then stewed in the water in which they were soaked.

An excellent compote syrup is made with ½ pint water and ½ lb. good white sugar. Put these in a saucepan, let the sugar dissolve by the side of the fire, then boil it without a lid for about 10 min., skimming it well, or until it forms a good thread when a little of it is taken between the thumb and first finger. To this syrup add any flavouring wished, such as lemon-juice or grated lemon-rind, ½ a class of some liqueur—kirsch, maraschino, etc., or vanilla or almond essence. Pour the syrup over the fruit, and allow it to cool.

COMPRESS. Folded lint or other material applied firmly as a pad to prevent bleeding or inflammation is termed a compress, and may be applied either wet or dry. For open wounds boracic lint should be used or the lint should be wrung out of antiseptic solutions.

For a black eye the compress may be cold, preferably iced. A spirit compress is made by lightly wringing the lint out of a lotion consisting of methylated spirit 3 parts and water 2 parts, and may be applied to a bruise. It should be covered completely by gutta-percha tissue and oiled silk. *See* Bandage.

CONCERTINA. The English 48-keyed concertina consists of two hexagonal keyboards, connected by bellows, and with keys arranged on the following plan:

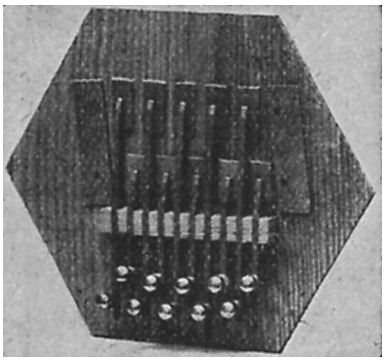


This plan must be memorised. As a help towards this, it should be noted that the two centre rows —_ here shown white— are all natural notes, written on lines for the left hand and on spaces for the right. The notes on each of the outer rows are in the same position on the stave as the natural row next to them, but are varied by a sharp or a flat. It will also be seen that the keys are arranged in sequence of 5ths. Sometimes the keys giving C natural are coloured red, the other naturals being white, and the flat or sharp keys black; but an expert player does not need this help. There is some duplication, three D sharps corresponding to three E flats, three G sharps to three A flats, and a B sharp to C.

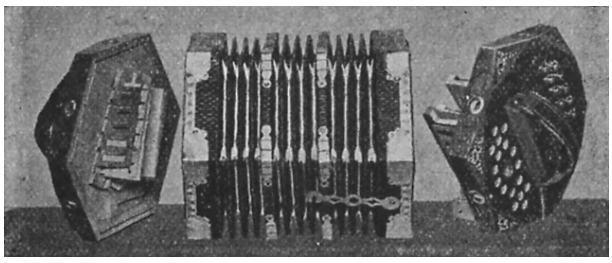
On each keyboard is an adjustable strap in which the thumb is placed, while in a line with this is a rest for the little finger. The points of both these fingers must press firmly on the keyboard. The concertina is best played in a sitting position, when the left hand rests upon the left knee, the other knee being kept low and out of the way, and the bellows are then worked by the right hand. They can only be inflated or deflated when a key is depressed, as there is no other air-channel.

The first and second fingers are mainly used to depress the keys, their normal position being above the centre rows, to which they immediately return after playing on an outer row; but in certain passages the third finger is also used. The chief rule is not to use the same finger twice consecutively.

Chords are possible on the concertina, and music written for the violin, flute, or oboe can be played on it. It might well meet with more general cultivation, for the sake of its sweet tone, its easy manipulation, and its portability; but unfortunately its reputation suffers by reason of the cheap German variety, which is a much inferior instrument, both in tone and range, playing only in the key in which it is set, and possessing a very simple modulation. In this concertina the keys produce different sounds, according as the bellows are pressed in or drawn out. *See* Accordion.



Concertina. Left, interior view of keyboard. Below, three principal parts of the instrument; left to right, reeds; bellows; keyboard.



CONCRETE AND ITS PREPARATION

How it is Applied to Structural and Ornamental Work

Other articles which describe building materials and processes include Brick; Bungalow; Cement; Cottage; House; Lime; Monar; Wall.

The material called concrete is a mixture of lime or Portland cement, called the matrix, with small pieces of stone, broken brick, gravel, or other hard substances, known as the aggregate, together with sufficient clean sand to fill in the interstices between the aggregate, the whole moistened and consolidated with water. It can readily be prepared by an amateur, and used for foundations, floors, walls and other parts of buildings.

When cast to shape in a wooden mould it makes admirable ornamental figures, garden seats, steps, imitation crazy or stone pavings, and numerous other items. The difference between lime concrete and cement concrete is that lime forms the matrix in the former case, and Portland cement in the latter. The amateur will generally find it best to use Portland cement, and the following hints are based on that assumption.

Good concrete must be homogeneous, dense, fire-resisting and strong, qualities attained by using suitable aggregates. For density, the cement must entirely surround every particle of aggregate and sand, and fill the spaces between them to form a solid mass. This can be ensured by proper mixing, and by ramming and tamping the mixture when it has been placed in position. This ramming consolidates the concrete, and should on no account be omitted for foundation work or where greatest strength is needed.

Suitable proportions of aggregate and cement for building uses are as follows:

FOUNDATIONS

Cement	1
Clean sharp sand	3
River ballast or gravel	5

FLOORS

Cement	1
Sand	2½
Broken brick	5

WALLS

Cement	1
Sand	2
Broken brick, furnace clinker or broken stone	3

This is for walls when cast between shuttering or boards so erected as to form a cavity, which is then filled with concrete.

PARTITION SLABS

Cement	1
Coke breeze	5
OR	
Cement	1
Sand	1½
Broken clinker or granite	3

This is for partition slabs made in wooden moulds. All proportions are by bulk, or measured with a pail and not by weight.

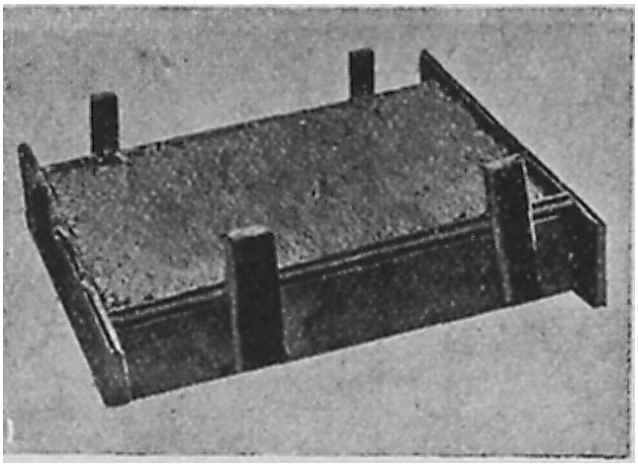
These materials will be mixed as follows. Place a large board or boards on the ground to form a solid platform. At one end of this place the aggregate, then add the sand, and put the cement on the top, making the heap conical in shape. Turn it over with a shovel to the other end, making another conical heap, and then back again. Then add water from a watercan with a rose head, and turn the material over again twice, in a moist condition. Remove it in a wheelbarrow to the place where it is wanted, and gently tip the mass into the trench or mould, doing this carefully to avoid separating the large from the small pieces. Then ram and consolidate the concrete and work it to as level a surface as possible. This causes a considerable shrinkage in the bulk, and sufficient extra material must be mixed in the dry state to compensate for this, at least 30 per cent. more dry material being needed to fill a given space with well consolidated wet concrete.

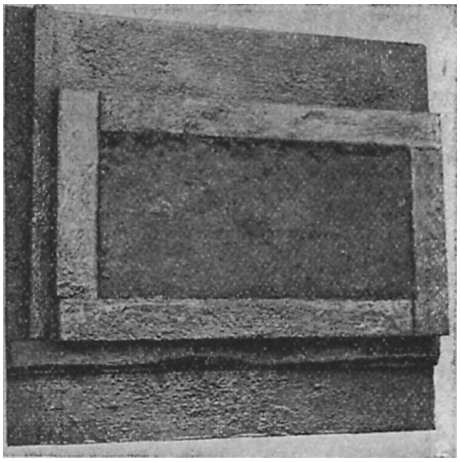
The size of the pieces composing the aggregate varies according to the work; for foundations, the aggregate may pass through a 2 in. mesh sieve; for floors, the largest pieces should pass a ¾ in. mesh. For fine castings the aggregate should pass a ½ in. mesh. Coke breeze and fine clinker used for partition slabs should pass a ⅜ in. mesh. Granolithic concrete for the surface of floors and hearths, etc., should be composed of 2 parts cement, with 5 parts of fine granite chippings or fine limestone chippings. The amateur will find that coke breeze, gravel (generally called "ballast"), or broken brick are the best aggregates to use, but on no account must garden mould or any other soft material be employed.

Concrete blocks for building walls and partitions are often made in machines built for the purpose, and when any consider-able number of blocks are needed it is an economy to purchase or hire such a machine; but an efficient substitute consists simply of four stout pieces of board of correct height, supported by pegs driven into the ground. These sides should rest upon a wooden base (Fig. 1). The concrete is shovelled in. rammed, and levelled off with a trowel, and left to set for a quarter of an hour. By using four such moulds the work of block-making may proceed uninterruptedly. The wooden sides are removed and the block lifted by the bottom board and set on one side to dry off. Stack the blocks so that the air can circulate between them, and to avoid their adhering to one another place pieces of newspaper between them. This class of block should be allowed to dry off thoroughly before it is used, and will be improved by storing for a month or so. The concrete should only be made sufficiently wet to hold together; too much water is detrimental, as it brings the cement to the surface. A better mould for making a breeze block is shown in Figs. 2 and 3.

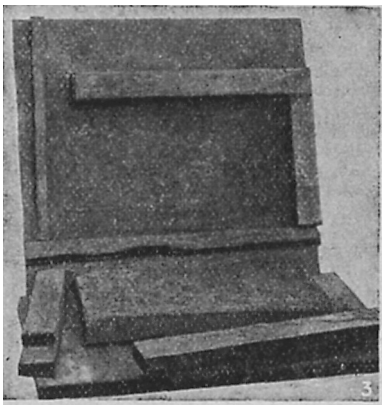
Concrete lintels, door posts, window-sills. fencing posts, and similar details are generally cast in a wooden

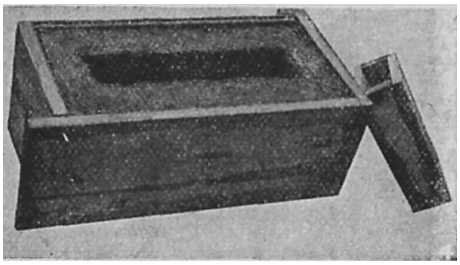
CONCRETE

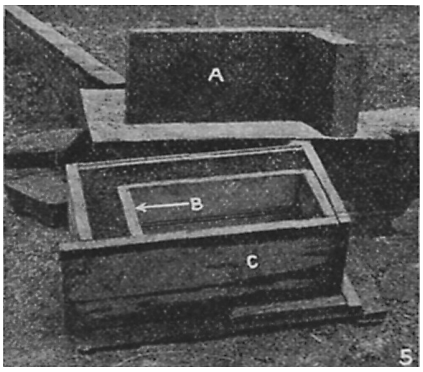


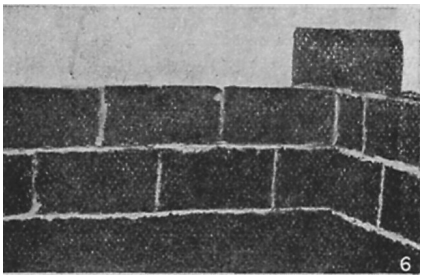


Concrete. Fig.1. Simple mould for breeze block. Fig. 2. Breeze in a mould. Fig. 3. Mould knocked apart, showing block. Fig. 4. Casting a hollow breeze block, the core removed and shown on right. Fig. 5. Casting a quoin block. Fig. 6. Partition wall of breeze blocks; quoin block used for bonding.









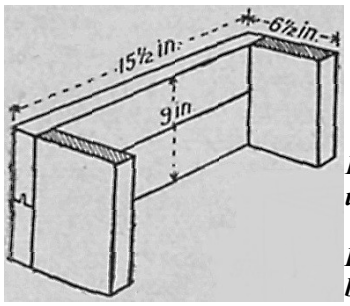
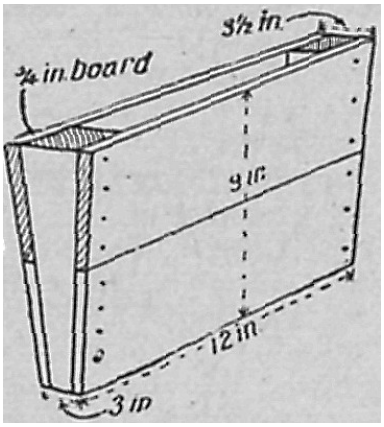
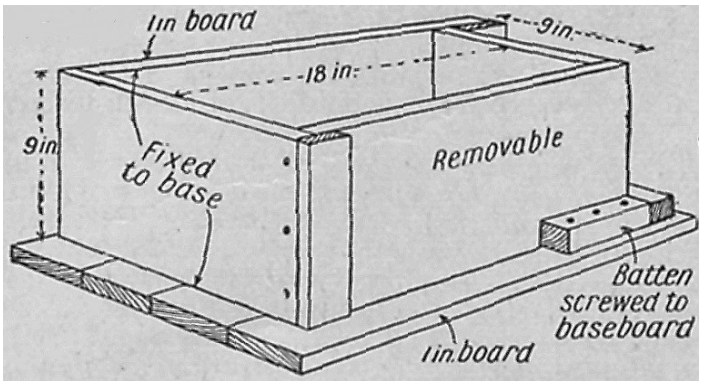


Fig. 7. Diagrams showing mould and core used for casting a hollow concrete block.

Right, construction of core for a concrete quoin block.





box or mould, and should have a stout iron bar embedded in the centre. The sides of the box are screwed or bolted to the ends to facilitate their removal. The same principles are applied to the construction of plinths and cornices, the strength of concrete being greatly increased by embedding iron rods, expanded metal, or even stout chicken-run wire, an elementary type of ferro-concrete construction.

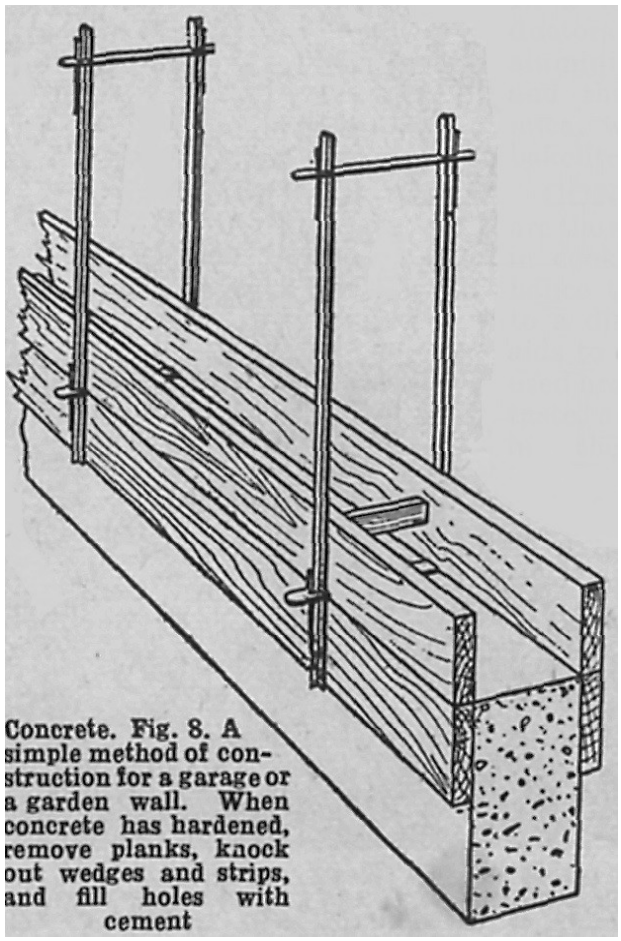
The construction of a simple building, such as a garage or storehouse, is well within the capacity of an amateur. The procedure will be governed by local conditions and personal requirements, but any one of the following methods can be applied. The ground is marked out, excavated, and the trenches filled with concrete as if for u brick building, as detailed under bricklaying. The walls can then be erected, with coke breeze or ballast as the aggregate used for making the concrete blocks, the work being carried out as if using bricks, except that cross bonding is effected with galvanised iron wall-ties built in as the work proceeds.

Another method is to use hollow blocks cast in a mould made for the purpose, as in Fig. 4. The construction of those moulds is quite simple, and all dimensions can be taken from the diagram, Fig. 7. With this class of block wall-ties are not needed. Partition walls can be built in by using quoin blocks cast for that purpose, as shown at A in Fig. 5, using the same mould box, C, with the core, B. The former or core is shown in Fig. 7. These blocks can also be used in conjunction with the flat coke breeze blocks and the quoin blocks. The method of bonding a wall made of coke breeze blocks is shown in Fig. 6, which also indicates the use of quoin blocks in making a return wall.

Still another method is to erect shuttering composed of stout wood boards with battens nailed to the back. These are hold upright by simple struts. The gap left between the two sets of shuttering determines the thickness of the wall, and is filled in by shovelling in the moist concrete and ramming it down hard and solid. When the concrete has set the shuttering is removed and re-erected farther along for the wall. Frequent use of the plumb rule and the line will ensure the wall being straight.

Several types of shuttering have been developed for such work, one of which is shown in Fig. 8. Metal strips are placed across the wall at intervals of, say, 5 ft. Through holes in the strips tee irons are threaded and secured by wedging. Planks are inserted and concrete is poured between.

The following are essentials to any satisfactory concrete building work. Use only the best cement; see that clean sand is used—it must be free from clay or earthly material; if it is not it must be washed by putting the sand in a trough and, while gently stirring the material, letting water run through it. This will overflow at one end and carry away the particles of dirt. The sand used must be coarse and graded—that is, some coarse and some fine. The aggregate must be clean and graded, some to be larger and some smaller, generally ranging from ¾ in. downwards for small work, walls, and floors. Concrete must not be applied to existing dry work, as in the form of dry foundations. The latter must always be saturated with water before the concrete is laid.



Concrete. Fig. 8. A simple method of construction for a garage or a garden wall. When concrete has hardened, remove planks, knock out wedges and strips, and fill holes with cement

Concussion. *See* Brain.

CONDENSED MILK. Sold in tins, either sweetened or unsweetened, condensed milk will keep for any length of time, and can be used, diluted with water, for all purposes for which milk is required. It is made by fresh milk being boiled and evaporated until almost all the water has been drawn out. Sugar is added as a preservative, and, in the best makes, no chemical preservatives are used. When required for use as fresh milk it should be diluted with water in the proportion of 4 or 5 parts of water to one part of condensed milk.

Condensed milk that is free from chemicals is considered to be a valuable food for infants and a good substitute for mother's milk, being used in proportions that vary with the constitution and age of the child. As little as ¼ teaspoonful to 1 tablespoonful of water is recommended for a newly-born infant. The proportion is increased as the child grows older. For infants' food the water must be boiled and allowed to cool before the condensed milk is added. The diluted milk must be allowed to cool to blood heat (98° F.) before being given to the child. *See* Milk.

CONDENSER. This is an apparatus for storing up electrical energy. It consists of two or more conductors separated by a nonconductor or dielectric. The actual capacity of the condenser may be fixed, or variable. In a wireless receiver the conductors or plates may consist of aluminium, brass, copper, etc., and the dielectric may be air, mica, waxed paper, ebonite or bakelite. *See* Capacity.

CONDIMENT. Condiments are the seasonings and spices used in cooking, which not only enhance the flavour and give zest to a dish, but are of value as aids to digestion. The quantities used are determined by individual taste, and care must be exercised in their usage. Condiments should always be cooked with the dish, and not added to it afterwards. The condiments in most common use are salt, pepper, mustard, and vinegar. Other much-used condiments are allspice, cinnamon, cloves, mace, nutmeg, ginger, and cayenne. All of these can be obtained ground to powder. *S e e* Allspice; Curry; Ginger; Mustard; Pepper; Salt,etc.

CONDUIT: For Electricity. An electrical conduit is an outer casing or covering in which the insulated conductor or wire is inserted in order to protect it from injury, and also to add to the electrical efficiency.

Steel conduit is made from welded steel pipe of various sizes, enamelled inside and out. Connexions are made by screwing the pipe on to sockets or other fittings in much the same way as gas piping. In other systems the pipes push into sockets formed in the fittings, and are sometimes scoured by means of a clip. Standard fittings for use with this material include bends and angles, for turning corners, junction boxes for connexions and branches, inspection boxes with removable lids for access to interior. The system is the only one that can safely be embedded in plaster or out-of-the-way locations.

When installing such a conduit system the whole of the pipes, complete with junction boxes, bends, and so forth, are fixed up in place, and then the electric conductors or wires are drawn into the tubes, using a thin steel wire pushed through the tubes from a junction box or inspection box, and attached to the wires to be pulled in. All wires that have to go through a particular section of conduit must be pulled through together. The conduit must be electrically continuous, and properly earthed to a large copper plate buried in the ground, or by a wire connecting the conduit to the water-supply pipes, but never to gas pipes. *See* Electricity.

CONEFLOWER. This is the popular name of rudbeckia, a vigorous hardy perennial which bears yellow flowers in late summer and autumn. It thrives in ordinary soil, may be planted in autumn or spring, and is easily increased by division of the clumps in March. The best are: californica, 6 ft., Golden Glow, double, 6-7 ft., and speciosa (Newmanni), 2 ft. Rudbeckia (echinacea) purpurea, grows 3 ft. high and bears reddish flowers.

CONFECTIONERY. This word is used for sweetmeats, and for cakes, rolls, tarts, and fancy pastry generally. *See* Cake; Chocolate; Pastry; Sweets, etc.

CONFETTI. These are tiny circles of coloured paper. They are used at fancy dress balls and carnivals; and at weddings, being thrown in handfuls at the bride and bridegroom as they emerge from church or set out for the honeymoon. For this purpose it is more suitable than rice.

Confetti can be purchased so cheaply that not many people will trouble to make it for themselves, though it can be done simply enough by folding sheets of thin coloured paper across several times, and cutting half-circles out of the folded edges.

CONFIRMATION. In the Church of England and the Roman Catholic Church confirmation is the ceremony by which a person becomes a full member of the Church and is allowed to partake of communion. The person then for himself or herself confirms the promises made by the godparents when he or she was baptized. The Church of Rome regards confirmation as a sacrament, but the Church of England does not. It can only be administered by a bishop, and candidates are usually between 14 and 18 years of age.

Those wishing to be confirmed should apply to a clergyman or priest. Confirmations usually take place early in the year, in order that the confirmed can partake of the sacrament for the first time on Easter Day. In most parishes classes for young men and classes for young women are arranged, and therein instruction is given by the clergy in the principles of the Church. Special arrangements are made for older people, the main point being that the person presented to the bishop must have satisfied a clergyman that he or she is fit to receive the rite. The public schools usually make their own arrangements for confirmation, boys being confirmed in the school chapel.

Confirmation services are held at stated times. A centre is chosen by the bishop, and at that church the candidates from the neighbouring parishes are required to present themselves. It is usual for girls to be dressed in white. At the service the bishop places his hand upon the head of each candidate as he or she kneels before him, and says over each a short prayer.

The Confirmation Cap. To make a confirmation cap, ¾ of a yard of material 27 or more inches wide is required, and the edges should be hemstitched. Three narrow tucks are placed at one end, and two short ends of ribbon fastened to the ends of the tucks on the wrong side of the cap. These tie in the nape of the neck, holding the cap tightly over the brows.

CONGER EEL: How to Cook. This fish is at its best for eating in September and November. The flesh, being coarse, requires thorough cooking, but is highly

nutritious. When small, it may be cooked in the same way as a fresh-water eel, but if large it is best cooked like cod. Conger eel can be boiled in a fish bottle in enough hot water to cover it and a teaspoonful of vinegar. After being brought to the boil it is allowed to simmer until the flesh falls away from the bone. It is served with parsley sauce. To fry conger eel, it should be dried, cut in slices, and sprinkled with flour. It is then dipped in beaten egg rolled in breadcrumbs, and fried in hot fat. It can be served with any fish sauce.

Another way of preparing conger eel is to let it stand for over an hour in a dish containing 3 tablespoonful of vinegar, ½ tablespoonful of chopped onion and a sprinkling of popper and salt. Then stuff it with veal forcemeat, bind it up with a piece of tape, and bake it for about 1 hour on a well-greased tin, basting it frequently. When it is ready, remove the tape, and serve the fish on a hot dish, with anchovy or other sauce strained round. *See* Eel.

CONGESTION: How to Avoid. This means an abnormal filling of the bloodvessels with blood. Active, congestion occurs when such filling is a result of the dilatation of the arteries. This form of congestion is the first stage of inflammation, but it can be deliberately produced in the superficial parts in order to draw off the excess of blood from a congested, deeper organ.

Acute congestion of the lungs may arise from breathing irritating vapours, e.g. poison gas, or from bathing when overheated or drinking large quantities of cold liquid. (*See* Lung.)

Passive congestion occurs when the blood lingers overlong in the vessels. The blood in this case is dark or venous in character. Inefficient pumping by a diseased or exhausted heart is a common cause. It may also be due to obstruction of veins, e.g. in pregnancy or from wearing tight garters or to the veins becoming varicose. Dropsy occurs and the legs swell. Relief is afforded by reclining at intervals with the legs somewhat elevated; in pregnancy a properly fitted abdominal belt, and in varicose veins elastic bandages, will reduce the tendency to passive congestion when one has to be up and about.

CONJUGAL RIGHTS. By English law when one spouse has left the other and refuses to return to matrimonial life without lawful excuse, the other may bring a suit in the divorce court for restitution of conjugal rights. The one who sues must be ready and willing to resume cohabitation, and thus it is usual for him or her (generally it is the wife) to write a letter inviting the other to return.

There are very few excuses that are lawful excxises for not returning: but a wife may refuse to return to a husband who has treated her cruelly; and a husband may refuse to return to a wife who has made unfounded charges of horrible conduct against him. A good excuse would be that the other spouse was suffering from a certain disease, or that it was otherwise dangerous to cohabit with him (or her). Matrimonial infidelity is a good excuse. If the respondent disobeys the order, he (or she) cannot after the time allowed is up come along and say "I am now willing to come back.' Disobedience to the order is equivalent to legal desertion, and the petitioner is entitled to alimony. *S e e* Desertion; Husband; Separation.

CONJUNCTIVITIS. This complaint is an inflammation of the delicate membrane which covers the white of the eye and lines the eyelids. It may result from a blow, a speck of dust, or the action of microbes. As most cases of conjunctivitis are very catching, the greatest care should be taken that the patient's sponges, towels or bed-linen are not used by anyone else.

In the acute catarrhal form of conjunctivitis the whole eye is bloodshot. There may be swelling with burning, itching, and a sensation of sand or grit in the eye. There is a sticky discharge, and the patient generally complains that his eyelids are stuck together in the morning. Pain and inability to look at a bright light may become marked and the discharge may become mattery. The eye should be bathed every half-hour with a 10 grain to the ounce solution of warm boracic lotion.

There is also the chronic catarrhal form. Here the white of the eye is constantly more or less bloodshot, and there may be inflammation of the edges of the lids and a slight amount of discharge collecting in crusts in the inner corner of the eye. It ought to be determined at once whether or not the patient requires glasses. If he does, and his vision is corrected, a long step may be taken towards curing the condition. A lotion that often gives excellent results consists of boracic acid 5 gr., zinc sulphate 1 gr., distilled water 1 oz.

Infection with the micro-organism of gonorrhoea results in a form of conjunctivitis known in infants as ophthalmia neonatorum, and said to be responsible for 30 per cent of the cases of blindness in Great Britain. A contagious form is trachoma or granular lids chiefly affecting the lining of the upper eyelid. Membranous conjunctivitis is frequently a symptom of diphtheria. Medical advice should be obtained at once.

Spring catarrh is a condition which affects chiefly boys and young men, giving them a pale, sleepy look. Reddish grey elevations form on either side of the cornea or clear part of the eye, and granulations on the under surfaces of the lids which have a pavement appearance. Signs of irritation, itching, intolerance of light and glueing of the lids in the morning are the result. Recourse may be had to radium therapy. *See* Eye.

CONJURING: SOME SIMPLE TRICKS

Useful Information for the Amateur Entertainer

See also Card Tricks; Children's Party; and the many entries on indoor and outdoor games that form the recreation section of this work

The conjurer should never tell an audience what is going to be done. For example, if a coin is to disappear

magically, call attention to it by holding it up, and after the disappearance has been accomplished, it can be safely stated that a touch of the magic wand on the hand which apparently holds the coin will cause it to disappear.

A great many of the most puzzling effects are produced by simple means. If a trick has been well received, resist all requests to repeat it before the same audience, unless the performer has the knowledge which will enable him to bring about the same result by a different method. Never perform any trick in public until it has been thoroughly rehearsed. In practising sleights do so before a mirror, and endeavour to deceive yourself.

One of the most difficult branches of conjuring to acquire is the patter, or description of the problem to be presented. If a humorous style suits the personality of the performer, adopt it, but be careful that the jokes are really witty and appropriate. A story is sometimes useful to illustrate the trick. Others may find a mysterious style more suitable. Whatever is chosen, it must be rehearsed continually until the performer is capable of exhibiting the trick without hesitating in his patter. It is not easy to do one thing while talking about something else.

The Magic Wand. The conjurer should provide himself with a magic wand. This is essential, as it is quite possible to have a small ball, a coin, or other article concealed in the hand if a magic wand is also held in the same hand. A small table is also a very useful accessory, especially if a servante is included. This latter is a shelf hidden behind the table which will receive any small article dropped on it.

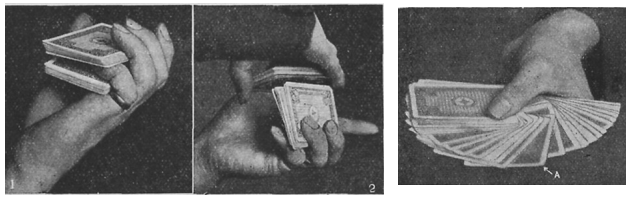
Palming a Coin. In order to palm a coin, take a half-crown, or, if the hand is small, a two-shilling piece, and place it on the tips of the second and third fingers of the right hand. Hold the left hand open, palm upwards, and pretend to place the coin into the left hand. As the right hand approaches the left, bend the fingers, pressing the coin into the palm of the right hand, slightly contract the hand, and if the coin has been placed in the correct position the fleshy portion of the palm will hold it firmly. A few experiments will readily show the best position suited to the individual performer.

As the right hand reaches the left, close the latter as if it contained the coin. During these moves the eyes of the performer must follow the supposed position of the coin, and on no account must a glance be directed towards the right hand. If the wand is used. it can now be picked up in the right hand, which will help to conceal the fact that the coin is there.

As the disappearance of the coin is now an accomplished fact, state openly that by the aid of the magic wand it is possible to make the coin disappear. Suiting the action to the word, touch the back of the left hand with the wand, or wave the wand round the hand, and demonstrate that the coin has magically flown by slowly opening the hand. When palming a coin, endeavour to hold the hand naturally, so that it looks to the audience as if it concealed nothing. Practise this sleight in front of a mirror, and before attempting to palm the coin actually place it in the left hand and study carefully the movements, especially the position of the empty right hand, then endeavour to imitiate these movements when palming the coin.

Tricks with Cards. Card tricks may be described as a special branch of conjuring. The essential sleights which must be learnt are the force, the top and bottom change, and the pass, and until these are mastered no really effective card tricks are possible.

The sleight called the force only becomes successful by experience and practice. It is used when it is desired that a certain card shall be selected. Have the card at the bottom of the pack. Insert the little finger half way down the pack so that the pass may be made. As the performer approaches the one on whom he wishes to force the card, the pass is made which brings the lower half of the pack to the top, with the selected card at the bottom of this position. Fan out the cards as they are offered and keep them moving towards the right, and just as the person puts out his hand to take a card, the fingers of the performer's right hand push forward the desired card.



The Pass. 1. Little finger of left hand is inserted between halves of pack, remaining fingers resting on top. 2. Bottom half of pack, in right hand, is then pressed into fork of left thumb, top half being lifted by left little finger.Right. Conjuring. Forcing a card. The card to be forced, A, is pushed slightly out of the fanned-out pack.

There are two chief changes, one where a card held in the right hand takes the place of the top card of the pack, which is held in the left hand. This is known as the top change. The second, designated the bottom change, is effected by changing a card held in the right hand for one on the top of the pack, but instead of the card taking its place on the top of the pack it is put at the bottom. To make the first change, hold the pack in the left hand with the thumb across the pack and the fingers underneath.

The card which is to be changed is held between the thumb and first finger of the right hand. While attention is drawn to this card the thumb of the left hand pushes the top card forward to the right about ½ in. Making a smart half-turn to the left, the right hand meets the left, which is advanced, and the top card is secured with the first and second fingers of the right hand, and at the same time the thumb of the right hand pushes the card that is to be changed on to the top of the pack.

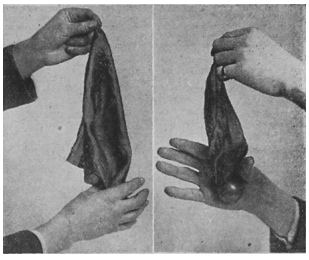
In the second method, the card in the right hand is held by the first and second fingers only. As the hands reach each other, the fingers of the left hand are opened to receive the card and at the same time the top card is pushed forward and secured by the first finger and thumb of the right.

The pass is one of the most important moves in card conjuring, and consists of a sleight which transposes the top and bottom halves of a pack. Making the pass can be accomplished with one hand only but for all practical purposes the double-handed pass is preferable.

The pack is held in the left hand in the position usual for dealing, the thumb being on top and the four fingers at the opposite side. Lift half the pack, and insert the little finger of the left hand at the break so made. The other three fingers should now rest on the top of the pack so that if the little finger is straightened out the upper half of the pack will be lifted to a vertical position.

The right hand now grasps the lower half of the pack by the edges of the cards, the thumb being at the lower end of the pack and the first three fingers at the top end. Pressing the lower half pack into the fork of the left thumb, it is pivoted upwards, and at the same time the little finger of the left hand raises the top half. As soon as the lower half can pass the top half, the pack is closed up and the pass is completed. When making the pass it is best to make a backward move of the hand, which will cover to a certain extent the various moves.

Handkerchief Tricks. There are many pretty illusions with silk handkerchiefs which are always popular. A simple production and disappearance of a handkerchief can be brought about as follows. A small hollow rubber ball about 1½ in. in diameter is necessary, which is prepared in the following manner: A hole about ½ in. in diameter is cut-in the ball and the piece removed. Opposite the hole two small holes are bored, through which a piece of thin catgut or flesh-colour silk is tied. The loop formed should be long enough to allow the ball to rest on the back of the hand when suspended from the thumb. To produce a handkerchief with this simple apparatus, it is only necessary to push a thin silk handkerchief into the rubber ball, suspending the ball on the back of the right hand, the palm being towards the audience.



Handkerchief Production. Hands are first shown empty and a handkerchief is produced magically from the finger-tips. The trick is performed by pro-ducing the handkerchief from a hollow wooden ball palmed in the right hand.
(*The photographs illustrating this article are by courtesy of L. Davenport & Co.)*

Showing the left hand also empty, make u half-turn to the right and bring both hands together, and under cover of the fingers of the left hand get the ball between the palms. A turn to the left is now taken, and with an up-and-down motion of the hands the handkerchief is slowly produced at the tips of the fingers. The handkerchief is now held in the left hand and the ball, which up to the present has been suspended from the thumb, is disposed of on the servante. To make the handkerchief disappear the several actions mentioned above are reversed.

CONSEQUENCES: An Indoor Game. This can be played indoors by any number of people. Each is given a slip of paper and a pencil, and is asked to write down an adjective applicable to a man. This done, each slip of paper is folded over, concealing the writing, and is handed to the player on the left. Next comes a man's names and the slips are once more passed on. These are followed by another adjective, this time applicable to a woman, and a woman's name: the name of some place or public building; a remark made by the man; and a remark made by the woman; what the consequence was, and what the world said.

As most players will follow out their own train of thought in writing these answers, and as each answer will come on a different slip of paper, the results when read out at the end are often both amusing and surprising.

THE CONSERVATORY AND ITS CONTENTS
The Gardener's Duties Simply Explained

Throughout this work articles on the flowers cultivated in the conservatory will be found, e.g. Begonia; Geranium; Orchid. See also Greenhouse and the constructional articles, e.g. Brick

For the house of small proportions there is no more delightful adjunct than a well-planned conservatory, opening, perhaps, from the drawing room by glass doors. Position is a matter of importance, and a conservatory with a southern or south-western aspect is more favourably placed than one built to the north or east side of the house; but whatever the position, many advantages will be obtained by artificial heating during winter.

A conservatory may be described as a glasshouse in which plants in flower, previously grown in a greenhouse, are arranged for effect. Most of the plants used in conservatory decoration are grown in flower pots, but if there is room for a border of soil certain kinds, e.g. camellia, acacia, abutilon, fuchsia and heliotrope may be planted there.

By cultivating a suitable selection of plants, in pots and planted out in the borders, it is possible to keep the conservatory attractive the whole year round, providing it is heated sufficiently to maintain a minimum winter temperature of 50-55 degrees.

Usually there is a bed of soil in the centre where the vigorous plants and shrubs are grown, and staging for pot plants at each side. It is an advantage to have the

paths paved or tiled, for they can be kept clean with the minimum of labour. Certain plants may be grown even beneath the staging: the most popular for this purpose are the green-leaved and variegated-leaved tradescantia, a creeping plant, and Begonia rex.

An attractive edging to the staging for pot plants adds considerably to the charm of the conservatory. Two favourite plants for this purpose are isolepis gracilis, which is of drooping grasslike growth, and panicum variegatum, with narrow green-and-white leaves. These may either be grown in pots or planted in a narrow border of soil contained in a zinc trough alongside the edge of the staging. Herniaria glabra, a creeping plant, with tiny green leaves, also makes a neat edging.

Climbing plants improve the appearance of a conservatory, and a careful selection will provide flowers throughout many months of the year. It is a mistake to train vigorous sorts on a trellis fixed beneath the glass roof, for they cast too much shade on the plants on the staging beneath. The less vigorous kinds are to be preferred for this purpose, for instance, roses in variety, abutilon, fuchsia, and the blue plumbago capensis, all of which lose their leaves in autumn. The conservatory pillars ought to be covered with climbing plants; a choice may be made from hibbertia dentata, yellow, cestrum elegans, rose, asparagus plumosus, smilax, heliotrope, ivy-leaved geranium, the yellow acacia baileyana, the yellow jasminum primulinum, the scarlet honeysuckle (lonicera sempervirens), the blue and white passion flowers, and the gorgeous orange and red streptosolen Jamesoni.

Vigorous climbing plants suitable only for training beneath the roof-glass of a large conservatory are the white clematis indivisa, cobaca scandens, solanum jasminoides (which has white flowers), the rosy mauve bougainvillea glabra, and the yellow cassia corymbosa.

The lapageria, with rose or white blooms, is a charming climbing plant for the shady side of a greenhouse, and the night-flowering cactus (cereus triangularis) is worth growing, but it must have a sunny place.

Plants grown for the sake of their ornamental leaves are invaluable in the conservatory. Chief among them are:

Coleus, dracaena, green-leaved and variegated india rubber plant, (ficus elastica), grevillea robusta, palms (cocoa weddeliana, geonoma gracilis, kentia belmoreana), araucaria excelsa, ferns, asparagus Sprengeri and plumosus, smilax, aspidistra, cyperus alternifolius, eucalyptus and ophiopogon variegatum, with green and yellow leaves.

Certain plants grown in baskets suspended from the roof are most decorative, and add to the attractiveness of the display. Some of the chief sorts are:

Drooping varieties oft tuberous begonia, asparagus sprengeri, begonia gloire de Lorraine, campanula isophylla, blue and its white variety alba, the rat's tail cactus (cereus flagelliformis), cape cowslip (lachenalia), fuchsia, lobelia tenuoir, oxalis floribunda, ivy leaved pelargonium, tradescantia, the variegated stonecrop (sedum sarmentosum variegatum) and some of the ferns—nephrolepis, davallia and asplenium bulbiferum.

The Management. With regard to the management of a conservatory, the following suggestions will be found useful. When the temperature by day, as a general rule, exceeds 65 deg., ventilation must be given. During cold or frosty periods of weather the temperature should be kept at about 55 deg., this being done by the aid of artificial heat. During the winter months the ventilators should be closed about 2 p.m. during the summer they should remain open till about 5 p.m.

Shading from hot sunshine is most essential, and this may be accomplished by one of the summer-cloud preparations sold by seedsmen, or preferably by movable roller blinds. Watering is another important item, and each morning sufficient should be given to moisten the soil, using water of the same temperature as the air inside the house. In addition, it may be noted that cleanliness and method are as essential in the conservatory as in the greenhouse.

During hot summer days it may be found necessary to give water both morning and evening, but in the event of a plant drooping by reason of dry roots, do not water in the usual way, but stand the pot in a vessel for 10 min. to ensure equal moisture of the whole of the soil. During winter sponge foliage plants with milk and water. Keep all dead blooms and foliage removed, and fumigate occasionally to destroy pests. If stimulants are necessary, use one of the excellent chemical manures on the market, strictly according to the maker's instructions.

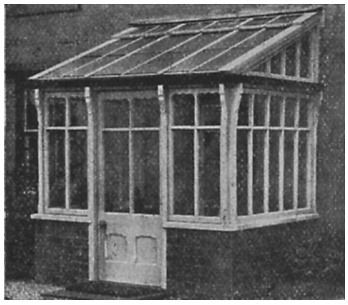
When properly conducted, a conservatory should be a source of interest and charm all the year round, and its possibilities, in conjunction with garden and greenhouse will be apparent from the following hints, which describe the plants which are most suitable for the conservatory in the various months of the year.

For January, early tulips, Dutch and Roman hyacinths, daffodils, freesias, winter flowering begonias, cyclamens and azaleas are suitable, as also are cinerarias and Chinese primulas. The same flowers are suitable for February. For March a succession of most of those mentioned for January will be found best, together with spiraeas, primulas, heaths, clivias and carnations. The same remarks apply to the succeeding month, April.

In May the showy herbaceous calceolarias are in full beauty together with amaryllis, Dutch and Spanish irises and annuals raised from seeds sown in September. Throughout the summer months there will be bloom from tuberous begonia, gloxinia, achimenes, geranium, heliotrope, fuchsia and many others. In autumn reliance must be placed chiefly on chrysanthemum, Scarborough lily, nerine, lilium auratum and other lilies. These will be followed by early bulbs, Chinese primulas and cyclamen, winter

cherry, winter begonias and carnations.

Building a Conservatory. Whatever the dimensions of a conservatory, it should be free from any suggestion of heaviness. It generally has means for heating, for regulating temperature, and controlling the amount of light. A water supply is desirable, and for the benefit of the plants a conservatory should be built facing the south.



Conservatory porch outside a French window (Courtesy of Boulton & Paul, Ltd.)

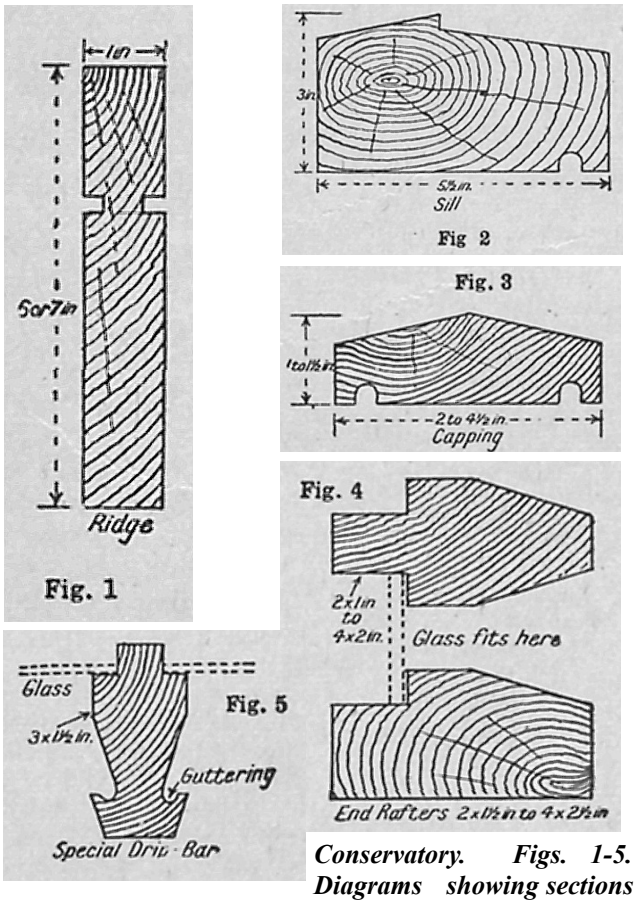
Below. Conservatory with semi-octagonal end exposing a large surface to the sun.



The usual construction comprises a brick or tiled floor, set in cement mortar, with a fall to one corner where a trapped gully communicating with an adjacent drain enables any surface water to be disposed of. The surrounding walls are made of brickwork to a height of about 18 in. The walls and roof are composed chiefly of glass, carried in wood or metal framing. The latter is more durable, but requires frequent painting owing to the dampness of the atmosphere in the conservatory. The roof should be constructed with throated or channelled bars to act as gutters. This to a large extent overcomes the objectionable effect of a dripping roof. Fig. 5 shows a standard form of machine-moulded wood bar made for conservatory and greenhouse purposes.

Elaborate conservatories are frequeatly made with large panes of glass, cut to ornamental shapes and framed accordingly. The amateur would do well to obtain horticultural glass, which is sold by the 100 sq. ft., in widths and lengths such as 10 in. by 8 in., 100 sq. ft. being quite sufficient glass for the purpose of covering an area equal to 10 ft. long by 10ft. high.

The framing is readily constructed by using greenhouse bars for the windows. A section is shown in Fig. 4, and this wood can be obtained in various widths and thicknesses. Windows to open will be framed up and provided with a strong framework to which they may be hung, generally from the top. A top and bottom framing should then be constructed, supported by upright corner posts about 3 in. square. The most convenient method is to make up the sides and ends in sections and bolt them together, then erect a ridge board and fix the glazing bars to it. A proper wooden ridging is made for this purpose, and a section of it is given in Fig. 1; other figures illustrate the regulation sills and end plates, all of which are obtainable from any timber yard.



Conservatory. Figs. 1-5. Diagrams showing sections of moulded and prepared timbers used in building a conservatory.

A water supply is generally obtainable either by means of a rubber hose pipe that can be connected when required to the nearest water tap, or preferably by running a ¾ in. iron pipe to the water main or other adjacent water supply pipe. In some districts the water company may charge an extra rate if this is done.

Means for heating may be a simple oil lamp and some hot-air pipes. A similar arrangement with hot-water pipes, or a regular hot-water circulating system, can be installed with a separate greenhouse type of boiler. A gas heater circulator with electric or thermostatic controls is a boon in changeable weather. It can be left burning all night, and any sudden drop in temperature will cause the controls to operate and so turn up the gas supply, and keep it up until the desired temperature has been attained.

Console. A console is a projection resembling a bracket (q.v.) used to support a cornice, or to hold busts, vases or figures.

CONSOLE TABLE. A console table is a table supported by brackets, or upon legs not unlike brackets in form, and made to stand against a wall. Some of these tables, which were chiefly made in France in the 17th and 18th centuries, have the

supports elaborately carved, and are beautifully adorned with representations of fruits, flowers, scrolls, etc. Some were gilded and covered with a marble slab. The chief woods used for them were rosewood and mahogany.

Consommé. This clear soup is made from meat, vegetable, or bone stock. *See* Soup.

CONSTANTIA. This district of Cape Colony is noted for the excellent quality of its red wine, the best produced in S. Africa. Constantia as applied to wine is a territorial description like Beaune. Most of the South African wines, with the exception of the one called Constantia, are named after their European prototypes. *See* Wine.

CONSTIPATION. This may be due to disease, general or local, but apart from disease the condition is more often induced by individual habits and customs. The movements of the bowels are induced by the presence of a certain amount of indigestible material and of fluid. Modern methods of preparing and cooking food tend to eliminate indigestible constituents, the result being that the bowel is deprived of a normal stimulus. Then, some people take too little liquid, and what they drink may be tea sufficiently strong to have an astringent effect. An active out-of-doors life has a stimulating effect on the muscles of the bowel and on the muscles of the abdominal wall, which contribute powerfully to the emptying of the bowel. This stimulus is reduced in those of sedentary occupations and habits.

The taking of food has the effect of producing movement along the alimentary tract, and with the majority of people this, coming on after breakfast, leads to a habit of relieving the bowels then. Many men find that a pipe of tobacco is a further help. But the particular time does not matter so much as the habit of soliciting an action of the bowels at the same time every day, as they can be trained to act regularly. The bowels may not move for two or three days without apparent ill-effect, but generally there is discomfort in the abdomen and a heaviness in the head, or even headache. If the condition is not relieved, the local discomfort becomes greater, perhaps accompanied by colicky pains, the appetite falls, the tongue is furred, and the spirits are depressed and the temper is irritable. If the constipation is chronic, the absorption of poison from the bowels may lead to a large number of bodily and mental infirmities.

In addition to the importance of regular habits stock should be taken of the diet, and this can be made more effective by the addition of fruit and vegetables, either cooked or raw, and by the use of wholemeal bread and oatmeal porridge. Syrup and molasses will be found helpful, and amongst fruits marmalade and stewed prunes are especially useful. Many find that a glass of water first thing in the morning and at bedtime keeps them right. Eating plenty of greens keeps the intestines clean. Milk, especially boiled, is often constipating, and the same, it is sometimes found, applies to red wines.

Value of Exercise and Massage

Exercises, especially those which bring the abdominal muscles into play, are useful, and should include as much open-air activity as possible. Massage of the abdominal muscles may be resorted to. This may be done by band, but a heavy ball, say about 5 lb. weight, rolled round the abdomen from the right groin up and across and then down to the left groin is found effective by many. A useful ball may be made by filling a chamois leather bag with swan shot.

Should there be any difficulty in getting the bowels to move, a small enema, ½ pint of cold or warm water or 2 drains of glycerin injected into the bowel, or a glycerin or soap suppository, should be employed. It may be necessary, however, to resort to drugs. Under the heading Aperient a list is given of a number of common preparations, with the dose prescribed.

During the first year of life the bowels usually move two or three times a day; in the next year twice, and thereafter once. Infants at the breast should be restricted to their regular times of feeding, and should not be put to the breast, merely to pacify them, outside these times. Constipation may be due to a lack of fat or sugar in the diet, however the infant is fed, and an increase of these should be tried, fat in the form of fresh cream, a teaspoonful once or twice a day, being given. If the constipation is urgent an injection into the rectum of a few ounces of warm water to which a little soap has been added, or a teaspoonful of glycerin, will be the quickest way to give relief.

To train the bowels into normal regularity when once constipation has become the habit, nothing gives better results in infants and young children than cascara. To a half-teaspoonful of sugar and water add 5 to 10 drops of the liquid extract of cascara, and give it to the child last thing at night; or twice this dose of the aromatic syrup of cascara may be given. The dose may be decreased or increased if necessary. When the requisite amount has been determined by experience, let the child have this dose nightly for two or three weeks, and then gradually reduce the amount, finally withholding it altogether. *See* Aperient; Cascara.

CONSUMPTION. This is the common name for tubercular disease of the lungs (pulmonary phthisis) or of the bowels. The word denotes the wasting of the body in tuberculosis. The cause of the disease is always the tubercle bacillus that was discovered by Koch. This minute organism may enter the system and settle in the lungs through a person partaking of meat that is tuberculous, or milk, or even through a wound in the skin. The commonest source of infection is from breathing germs floating in the air. The expectoration of a consumptive may be laden with millions of such germs, and when it dries on the ground or the floor the germs may live for months. Clinging to dust particles, they are carried about the atmosphere, and can infect other people. Sunlight, however, possesses a powerful effect in destroying their activities.

Tuberculosis is still one of our commonest and most deadly diseases. Since 1913 it has been notifiable. It is estimated that about one-seventh of the human race dies from tuberculosis in one form or another. It is possible that the infection takes place chiefly in childhood, when unhealthy tonsils and adenoids are rife, and when the resistance to the passage of bacilli in milk through the intestines is relatively low. Some children are born with a low resistance to tuberculosis; but a large number of cases in which the disease appears to be inherited are really instances of direct infection from an affected parent.

When the tubercle bacillus invades and develops in the lung there is a new growth of cells which solidifies the part of the lung affected. These masses of cells, known as tubercles, may be sufficiently numerous thus to solidify a considerable area and destroy the lung tissue there. The cells commonly become converted into cheesy matter, which softens and is coughed up. A cavity is left with ulcerated walls, and blood vessels are opened up or burst, causing haemorrhages. which may be large. These cavities are liable to become infected with the microbes of putrefaction, and this adds greatly to the poisoning which is already being caused by the tubercular microbes and is the cause of the foul sputum brought up. The disease tends to spread and destroy the adjoining healthy lung. In some cases, however, repair processes come into operation, new fibrous tissue forms, the disease is walled off, and a cure results, with a scar in the lung.

Tuberculosis of the lungs may show many variations of form. It may occur as a part of a general blood poisoning by tubercle bacilli, in which symptoms indicative of the involvement of other organs besides the lungs are present, e.g. meningitis. This occurs most frequently in children, and is usually rapidly fatal. There is also the acute infection of the lungs, known its galloping consumption, in which the condition may resemble pneumonia (q.v.) or broncho-pneumonia. The latter is common in infancy, and may follow measles, whooping cough or simple bronchitis. These forms may prove fatal in a few weeks or may pass into chronic tuberculosis of the lungs. This is the commonest form of the disease, and usually comes on insidiously.

Significance of a Persistent Cough

Persistent slight cough with no expectoration at all at the start may be the earliest sign. Later there may be streaks of blood in the expectoration. A doctor should then be consulted. Ready fatigue, a tendency to sweat at night in bed, and a slight afternoon rise, in temperature are other early symptoms.

The spread of consumption is favoured by herding people together in small houses and in workshops, and by insufficient or improper food. But even if accommodation is restricted the danger can be minimised by flooding the premises with air and light. With regard to food, it has been pointed out that the decline in consumption during the last 50 years coincides with the importation of foreign meat into this country, with an increase and cheapening of protein food. It is of great importance that patients, and especially children, recovering from acute diseases, particularly measles, whooping cough, and broncho-pneumonia, should be closely watched throughout their convalescence, as the seeds of consumption are often sown then. It is obvious that grave danger lies in allowing people to spit on the streets, in public places or vehicles, or elsewhere, at large.

Every time an advanced consumptive speaks, coughs, or sneezes, he exposes those about him to the possibility of infection.

Persons who suffer from tuberculosis should carry a sputum flask or cup, which can be obtained from any chemist or hospital that treats lung diseases. A few drops of some disinfectant are carried in these flasks, and in using them care should be taken that all the sputum goes inside. If any is left on the orifice it dries and is scattered as dust, and this is the danger that lies in using a handkerchief.

To protect the rest of his household the consumptive should have his own table cutlery, plates, serviettes, etc., and no one else ought ever to use his towels or sleep in the same room with him. The habit of washing the hands before touching food should be inculcated and practised. The consumptive's handkerchiefs, pillow slips, etc., should be soaked for some hours in a solution of carbolic acid (1 part of carbolic to 20 parts of water) or some other disinfectant before being sent to the wash. The person who has to look after the rooms of a consumptive should always wear a light muffler covering the nose and month when sweeping, and utilise wet tea leaves to prevent dust. Instead of sweeping or dusting, cleaning should be done when possible with a damp cloth, which can be wrong out from time to time in a disinfecting solution.

Treatment. The treatment depends on the stage of the disease. Broadly speaking, if the patient has an evening temperature above 100°, he should be kept in bed. On the other hand, he may be put to exercises or graduated work, particularly when the disease tends to become quiescent. The treatment must be closely supervised by the doctor at all stages, but the intelligent cooperation of the patient and his friends is necessary. Essential constituents of the diet are raw meat and eggs. Smoking is likely to be harmful. Alcohol, with the exception of beer or light red wine, should not be taken except under a doctor's orders.

The maximum of fresh air, both day and night, is required at all stages. If a shelter with a well-boarded damp-proof floor can be arranged in the garden, the patient should begin by sleeping out of doors on fine nights. After a few nights he will find that he is perfectly comfortable, even when the weather gets colder. The effects of fresh air are often very noticeable. The hectic flush, the pallor, the irritating cough, and the tendency to night sweats often immediately pass off. If the patient cannot sleep in the open, his bedroom should be as simple and bare as

possible. The bed should be placed near the open window. Draughts will be avoided by having the window widely open night and day.

The most useful of all medicines in consumption is cod liver oil (q.v.). Other drugs frequently used are creosote, guaiacol carbonate, and arsenic. Treatment by injections of preparations of gold have given good results. Preventive measures include the administration of Calmette's tuberculin during the first week of life.

Intestinal Consumption. Consumption of the bowels is common in young children, and the tubercle bacillus may cause ulceration of the bowels, and may settle in the glands running along the spinal column at the back of the abdomen. This abdominal tuberculosis is very frequently associated with the disease on the lungs or elsewhere. In the great majority of cases it is due to the infection by the type of tubercle bacillus found in cattle and conveyed in unboiled cow's milk. Fresh air and sunlight are essential. If possible the child should be taken to the country or the seaside. Complete rest is necessary, but when the child's condition warrants it, this should be on a bed out of doors, or in a long perambulator or invalid carriage. With regard to diet, here also raw meat and eggs are indispensable. Cod liver oil will be useful. One way to give it is to rub it gently into the abdominal wall, or apply it there and cover over with a flannel binder, when the movements of the child will rub it in.

CONTAGION: How to Avoid. Infectious diseases may be acquired by direct contact with a person suffering from such a disease, from handling clothing or other articles which have been in contact with him, from infected air, water or milk, or other food, or in some cases the disease may be through the agency of insects.

In public places of refreshment, during a rush of business, the glasses, cups and other dishes would appear often to be washed in a perfunctory manner, and it may be wiser to go thirsty than drink out of a glass which has possibly just been used by one whose mouth is in an infectious state. The use of a hairbrush which is at the disposal of all and sundry involves a risk, at the least, of dandruff, and possibly of ringworm. The same applies to laying one's head on the cushions of a public conveyance. Anthrax has been acquired from shaving brushes imported from abroad, and when a new one is purchased it should he soaked in a disinfecting solution. Various disorders are propagated by air; for example, a common cold, influenza, measles, tuberculosis, etc. In such diseases as consumption where there is much expectoration a sputum flask should be rigorously employed.

There is always a risk of infection through unprotected cuts or sores on the hands. When one has come into contact with a possibly infected person in any way a free use of soap and water, and preferably also of an antiseptic solution, such as permanganate of potash, should never be neglected. A measure of protection more or less effectual is afforded by vaccination against smallpox, by inoculation against enteric fever, etc., and by vaccines against colds, influenza, and other diseases. *See* Disinfection; Fever; Fly, etc.

CONTAGIOUS DISEASE. Disease that is passed from one person to another by contact is termed contagious disease. The person passing the disease may be one actually suffering from it or he may be a carrier: that is to say, that although he may be quite well in himself he carries disease-producing microbes about his body. This may be because he has at one time had the disease, but not necessarily, as people are found with the microbes of such diseases as diphtheria and cerebro-spinal fever in an active form, although they might not have shown the symptoms of the disease or, at any rate, have attracted any attention.

The contact may be of an intimate character, as in ringworm and other diseases; but, on the other hand, clothing which has been worn by infected persons, e.g. smallpox or scarlet fever, may be conveyed hundreds of miles away and infect other people.

In Great Britain the law requires the notification of certain of these diseases, smallpox, scarlet fever, diphtheria, enteric fever, etc., to the medical officer of health, and, if necessity arises, other diseases, such as measles and whooping cough, may be added to the list.

Anyone who knows he is suffering from a notifiable disease must not expose others to infection in any street, place of entertainment, club, hotel or shop; he must not take books from any circulating library; he must not use any public vehicle such as a train, tram or bus; and before he hires a taxi he must tell the driver of his illness. Infected articles must not be sent to a laundry until they have been disinfected.

Any child which has suffered from or been exposed to infection of a notifiable illness may be prevented from going to school. Anyone who ceases to occupy a house within six weeks after some person in the house has been suffering from some notifiable disease must have the house disinfected and give notice, to the owner. A hotelkeeper must, not a1low any room in which there has been anyone with a notifiable disease to be used until the room and its contents have been disinfected.

The advantage of notification is that means can be taken at once to isolate patients and those who have been in contact with them. *S e e* Disinfectant; Fly; Notification; Quarantine; Vaccine, etc.

CONTRACT: The Legal Sense. A contract is an agreement enforceable at law. It requires an offer and acceptance of that offer; valuable consideration; and an intention that the agreement shall be a legal one; thus, if one offers to receive a man to dinner in a friendly way, and he agrees to come, it is not a contract. Offer and acceptance may be by word or conduct. An acceptance of an offer is not an acceptance unless it is unconditional. Thus, if one man offers to sell another something for £20, and the other replies that he will take it subject to 5 per cent, discount for cash,

he has not accepted the offer and there is no contract. A contract by post is complete and binding on both parties the moment a letter accepting the offer is posted.

An offer can be cancelled at any time before it is accepted, unless something has been paid for it to be kept open. Thus, if a man asks a tradesman to keep open till Monday at 12 noon an offer to sell him a dress at a certain price, and the tradesman agrees, he can nevertheless cancel his offer before 12 on Monday. But if even a penny has been paid to keep the offer open till that time the tradesman must keep it open. An offer is open for a reasonable time, unless a definite time is specified; and after a reasonable time has elapsed it is automatically cancelled without further notice.

Acceptance must be expressed whether in words or by an act. Thus, a letter says, "You can have the sealskin coat you saw for £50, and if I do not hear from you I shall send it to you." The person to whom such an offer is made is not bound to answer: and if he does not, and the coat is sent, he is not bound to take it. Of course, if he keeps it, he must pay the £50.

A few contracts require to be evidenced by writing. The writing may be signed at the time, or may be contained in subsequent correspondence so long as all the terms of the contract are shown. The following are contracts that must be in writing:

Contracts for the sale of land or any interest therein.

Contracts which cannot be completely performed within a year from the; day f hey are made, e.g. a e-onf ract to engage a governess for a year, the service to begin twe) days hence.

Contracts in consideration of marriage—not a promise to marry; but such a contract as this: "If you will marry me (or my son or my daughter), I will give you: £100."

Contracts of guarantee.

Contracts for the sale of goods at a price of £10 or over. But if anything has been paid for or on account of the price, or to bind the bargain, or the goods or part of them have been delivered to and accepted by the buyer, there is no need for writing.

Although in either cases writing is not necessary, it is always better to have the terms of a contract of any importance in writing. One should sit down and write a letter, " Confirming our conversation of to-day's date," and set out all the terms agreed on as clearly as one can.

The consideration for a contract required by English (but not Scots) law may be a payment or a promise in pay; doing something or promising to do something. And the payment or the act done need not be for the benefit of the person who makes the contract. Thus, if A chooses to say to B, "If you will give Jones a job as your gardener, I will give you a ton of coal," and B gives Jones the job, A must give B the coal or pay him the value thereof. If one party to a contract fails to carry out its terms, the other may sue him for any damages caused by the breach of contract. Usually this is the only remedy available, but in cases in which damages would not adequately compensate the other party, the party at fault may be compelled to carry out the contract as he promised. Thus, if I buy from you 1,000 lb. of tea for 1/- a lb. and you fail to deliver, I cannot compel you to do so, because I can probably buy 1,000 lb. of tea elsewhere, and if I have to pay more for it you must pay me the excess as damages. If, however, I buy from you a snuff-box which is supposed to have been used by Prince Charlie and you refuse to let me have it, I can compel you to do so, for however much you may pay me as damages I would probably not be able to buy another snuff-box with the same associations.

In some eases contracts which are otherwise valid may be held to be void on the ground that they are against public policy. Obviously a contract to commit a crime is void on these grounds. Further, any contracts which restrict more than is reasonably necessary the right of a man to carry on his trade or profession are also void. Thus a doctor in a country town, on taking an assistant, could agree that the assistant should not set up in competition in the same district for a certain time. If however the district set out in the contract is wider or the time is longer than the court thinks was necessary to give the doctor reasonable protection the clause will be void. *See* Agreements.

CONTRACT BRIDGE. This form of the game of bridge differs in one or two important ways from auction bridge, which it has now almost entirely superseded. It is fully explained under Bridge (q.v.).

CONTUSION. Any injury inflicted on the tissues by a blow from a blunt body or instrument which does not break the skin is termed a contusion. The soft tissue below the skin is torn, and bleeding takes place from its vessels. The part is swollen, hot, and painful, and discoloration usually follows. The treatment consists of rest and the application of cold cloths. *See* Bruise.

CONVALESCENCE. The period following recovery from a disease, but before the restoration of normal health, is known as convalescence. In acute febrile disorders this usually dates from the final drop in the temperature, but the patient is left with debilitated tissues and organs. This condition is the effect of the fever and the poisons in the blood which were responsible for its production. In the case of diseases, the brunt of which falls on particular organs, there are gross lesions to be recovered from, e.g., ulcers in the bowel in enteric fever, and more or less consolidated lung in pneumonia. The patient's digestive powers ami his capacity for exertion are therefore reduced, perhaps very much reduced. He may himself be conscious of this and amenable to necessary restrictions imposed by the doctor, but sometimes he may be impatient, thinking that he is better than he really is. The doctor's instructions must nevertheless be carried out, and on the part of the nurse firmness and tact will be called for.

In changing from slops to ordinary diet there should be a progressive introduction of articles of food which make greater demands on the digestion. Variety should be aimed at, and the cooking and serving should be as attractive as possible. The nurse and not the patient should decide, what food is suitable.

Food for Convalescents. To facilitate the composition of the daily menu the following suitable foods may be named, it being understood that those first mentioned are intended to be the sole diet in the first days of convalescence, though they may be continued throughout; but those in the latter part of the list are not selected until after four or five days of uninterrupted progress. All pastries should be avoided.

Milk, alone or with soda or potash water, Benger's Food, Allenby's Diet No. 3, beef tea, strong hock soup, egg flip, thin arrowroot made with milk, tea and coffee.

Calf's-foot jelly, chicken jelly, mutton broth, chicken soup, thin bread and butter, toast, plain biscuits, plain sponge cakes, milk jelly, junket.

Oat flour porridge, revalenta, good milk puddings and custards, eggs poached or soft boiled, steamed fish (whiting, sole, plaice or haddock) with milk sauce.

Cauliflower with white sauce, spinach, tripe or sweetbreads, chicken or rabbit, baked apple with cream, a little fresh fruit.

Roast, mutton or the eye of a tender mutton chop, a boiled mealy potato.

In convalescence from enteric fever the craving for solid food may be very strong, but should be resisted until the doctor gives his permission, as rupture of the bowel through a partially healed ulcer has been a not infrequent sequel to an evasion of his orders. At the same time it must be ever present in the minds of patient, nurse, and friends that while the pace must be regulated, steady progress towards recovery is expected.

In general, convalescence is that period during which a patient either regains or fails to attain a full measure of health; and it has been well said that more lives are ruined by faulty nursing or insufficient care during convalescence than by disease itself. In the home there is no excuse for failing to carry out the simple requirements of convalescence.

Above all things, a cheerful outlook must be maintained, for convalescent patients are very apt to feel depressed. Nevertheless, noise must be avoided, as it exhausts the patient's energy more than he realizes.

Convalescents have been known to shed uncontrollable tears because the voice of the person speaking to them was too loud.

CONVOLVULUS. Alternative name for bindweed. There are perennial and annual bindweeds: two of them, Convolvulus arvensis and sepium, are most troublesome weeds. Cneorum is a charming rock garden plant with grey leaves and pink flowers; it needs well-drained soil and a sunny place, and is hardy only in mild districts. Among the annual forms of convolvulus are several showy half-hardy plants. They are raised from seeds sown under glass in March, the seedlings being planted out of doors in May. Seeds may also be sown out of doors in April. Convolvulus major, a climbing plant, and minor, of low growth, have flowers in many showy colours—pale blue, crimson, purple and rose. Other flowers often called convolvulus are known botanically as ipomoea. The loveliest of these is Ipomoea rubro-coerulea which bears large blue flowers and is best grown in the greenhouse from seeds sown in spring. Coccinea has bright red flowers.



Convolvulus. The climbing annual convolvulus, a showy summer flower.

CONVULSIONS: Cause and Cure. In infants and young children convulsions are most often due to teething, indigestion, worms, rickets, or the onset of acute fevers. In grown people the commonest causes are epilepsy, hysteria, uraemia, poisoning, chronic alcoholism, pregnancy, and brain tumour or injury. The rolling of the eyes, jerky movements of the limbs and head, with twitching of the muscles and grinding of the teeth cannot be mistaken. Consciousness is lost, except in strychnine poisoning, where the mind remains clear, and in hysteria unconsciousness is more apparent than real.

If an infant is attacked the doctor should at once be sent for. The infant must be placed in a warm bath, and a succession of cold cloths applied to the head. The duration of the bath will be 5 to 10 min. In adults the convulsion will probably come on sudden1y, and the patient falls down if he is on his feet at the time. No attempt should be made forcibly to prevent the movements, but these may be controlled sufficiently to prevent the patient from injuring himself, and if necessary he should be moved out of the way of danger. A pillow or a folded coat should be placed below the head and shoulders, and any tight clothing about the neck or waist should be loosened. To protect the tongue, which is often bitten, cork or a piece of wood, or the handle of a pocket knife, well guarded by a handkerchief, should be thrust between the back teeth.

CONY. The old name of the rabbit is now used chiefly for its fur when employed for wearing purposes. Ordinary cony skins come in vast numbers from Australia, and white rabbit pelts either from Normandy and other parts of France: or from China.

Cony is usually treated to imitate one of the more costly furs. Thus white rabbit figures as ermine and, when dyed, as chinchilla, beaver or electric sealskin. White rabbit furs, if first stripped of their linings and wadding, will wash beautifully in a lather of warm soapy water. They should be shaken out well and hung in the open air to dry. *See* Fur.

COOK. Except where there is a housekeeper the cook is the head woman servant. She is responsible for the cleanliness of the kitchen premises, though in larger households she takes no actual share in the work of cleaning. The dining room meals are her chief concern. She is often expected to arrange as well as cook them, and probably has a kitchen maid to do the rough work and help with the preparation of the food.

In smaller households where there is neither kitchenmaid nor scullerymaid she is usually expected to do a certain amount of cleaning and housework as well; she is then responsible for the kitchen premises herself, and may occasionally be expected to look after the hall and dining room in the early morning. If this is to be included in her work it should be mentioned when she is engaged. A cook can command higher wages than any other maidservant. *See* Chef; Servant.

COOKERS: GAS, ELECTRIC, OIL, AND FUEL

The Best Examples of Various Types Described and Illustrated

For further information see Boiler; Kitchen; Oven; Range. The entries Electricity; Gas may also be consulted with advantage.

Apart from the ordinary kitchen range, which may be made to burn coal, coke, wood or household rubbish, cookers are constructed to consume three main types of fuel: gas, electricity and oil. For this reason they are dealt with here under these main headings. It should be remembered, however, that the kitchen range usually performs four separate and distinct functions. The first of these is cooking, toasting, heating flat-irons. It heats the kitchen and heats water, usually by means of a boiler at the back of the fire-box, or use in the scullery, lavatory or bathroom, or for warming the house by hot water or steam radiators. It also consumes household rubbish.

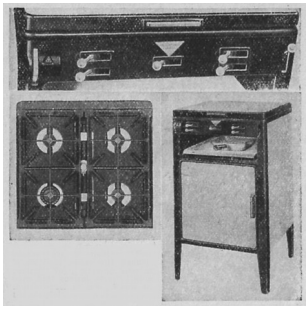
When the three types of fuel are used, these functions are performed separately, and it may be necessary when replacing a kitchener to divide up these four functions among the various fuels available. For instance, if gas, coke and electricity are available, a good method is to cook by means of gas or electricity, and to central-heat with coke.

Where electricity is already installed, gas is generally available. Most gas or electricity companies will, if desired, hire out a cooker, and some companies supply cookers on hire-purchase terms, payments for these being made over one or three years.

In considering cost, it may be taken that where the cost per unit of electricity is not more than one-tenth that of the gas therm (e.g. 1d. per unit and l0d. per therm), electric cooking is as cheap as gas cooking. An advantage in the use of electricity is that the heat can be produced in the exact spot where it is required. In a saucepan or kettle the heating coil can be placed in the middle of the liquid. A cheaper rate is allowed for electricity for cooking and heating than for lighting, and for the former purpose a separate meter is installed.

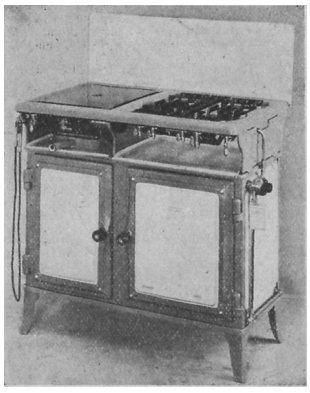
Types of Gas Cooker. It is always advisable to examine the latest improvements in cookers within the purchaser's scope.

In some cases it is possible to place a cooker in a recess, either formed by the removal of a kitchen range or in the original plan of the room; this arrangement has the advantage of screening the heat from draughts. The recess should be lined with sheets of enamelled iron, oxidised metal or by tiles to ensure cleanliness. In the small type of kitchenette found in many flats an enamelled cooker, with racks for dishes, etc., is admirably suitable. The latest designs embody such features within the main cabinet of the design, so that the old form of a gas cooker as a machine bristling with "gadgets" has become a compact and simple whole. In the small model, Fig. 1, hotplate burners are self-lighting, and the Regulo control (described below) and taps are built into a single control-panel.



Cooker. Fig. 1: "New World" gas cooker with Regulo-control. Top: close-up view of oven heat control, adjusted from thumb-wheel at left. Below it, the hot-plate (Radiation, Ltd.)

Oven Heat Control. In Fig. 2 is shown a type of cooker suitable for the culinary purposes of a larger household. It serves the functions of a complete kitchen range, and may be obtained in various mottled-porcelain designs to taste. The oven is, as in all up-to-date cookers, Regulo-controlled; and the warming-chamber also included can be used for low-temperature cooking as well as for its normal purposes of keeping things freshly hot until dishing-up time and re-heating cooled dishes. The usual plate and saucepan racks are provided, and thermo-static control maintains the desired temperature exactly.



Cooker. Fig. 2. "New World" range, consisting of a Regulo-controlled oven and (on left-hand side) a warming-chamber for food ready for serving, plates, dishes, etc., which can also be used for low-temperature cooking.

Other smaller types of cookers also are obtainable with ovens fitted with thermo-static control. If the oven becomes too hot, the gas automatically goes down; should the heat begin to cool off below the desired temperature, the gas goes up again to keep the heat just right. A chart is supplied with the cooker, by which the oven is regulated. The

bottom of the oven is closed in by a baseplate upon which low-temperature cooking — milk puddings, casseroles, etc. — may be carried on while the other items of the meal are cooking above. Gas is economised by having only one burner in the oven instead of two, and by the fact that the flue outlet is at the bottom instead of at the top of the oven, so that the heat is retained for a longer time.

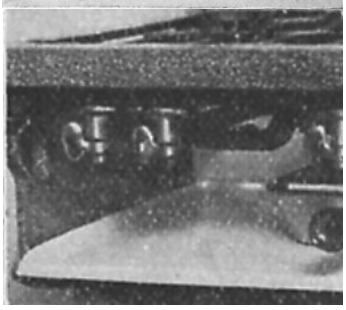
In some makes of cookers the boiling burners are so designed that they do not become clogged, neither will flames be extinguished by liquids boiling over. Each burner is fitted with regulators to ensure an even heat spreading over the bottom of the cooking utensil. Metal disks provide a rest for small saucepans on the hot-plate.

A pre-determined temperature can be maintained without any practical variation, by means of the Regulo oven-heat control (see Fig. 1, top illustration), which operates on the principle of the bi-metallic coupling. Its use has given a considerable impetus to home cooking, owing to the ease with which really good results are obtainable.

Hints on Cleaning. Little and often should be the motto for cleaning all gas cookers. The oven, plate-rack, stand, trays, etc., should be all washed every day if possible, but at least once a week. The burners, in particular, cannot be expected to give their highest efficiency and economy unless they are kept scrupulously clean. For this reason, all burners and grids should be easily removable by hand. If very dirty they may be boiled in water and soda. A wire brush is useful for cleaning these (see illustration) and also for removing the dirt from corners and ledges in the oven. Grease should be washed from the cooker with hot water with a little soda in it after the cooker has been used. Grease is easy to remove while the stove is still hot. A preparation is obtainable from most oilmen which can be used with a special brush to remove stale grease. The preparation is left on all night and washed off with boiling water.



Cooker: how to keep a gas cooker clean. Grids and burners being scoured with hot water and soda. Below. Fig. 4. Removing grease with a special preparation.





Unless of rustless steel, the bright steel parts should be cleaned every day with fine emery cloth, and the hot-plate grids with a rag moistened with turpentine and then wiped with a dry cloth.

Unless the unpolished parts of the outside of the cooker are enamelled, they should be cleaned with blacklead daily. If the stove is not going to be used for some time, these parts should be thoroughly washed and dried, then covered with grease. Before using the cooker the grease must be washed off again with hot water and soda. When using a gas cooker always turn out the gas immediately it is no longer needed, and never allow flames to flare-up the sides of pots.

Hints on Using. The proper way to heat up a gas oven is to turn the gas half on, light it, and leave the door closed for two or three minutes. Then turn the gas full on for about 10 min., after which the oven will have attained its full heat, and the door should be left open for a minute or two to allow all the steam formed to escape. The oven will then be ready to give out the steady, dry heat required for baking, roasting, etc. It is best to get the oven up to the required temperature to start with, and then lower the gas to maintain this. Never turn on the oven gas without first opening the oven door. Always have a lighted match ready before turning on the gas, especially for the oven burner. Don't heat the oven up specially for one or two small dishes; make good use of it on baking days. As soon as cooking is completed, the oven should be wiped out with a damp cloth. A bowl full of water placed in the oven immediately after cooking is finished and the gas has been turned out will provide hot water for washing-up without extra cost.

Never use a solid shelf in the oven, excepting as a deflector to throw down the heat on to the top of the food being cooked (for browning purposes), as a solid shelf effectively prevents the heat from rising to the food on the shelf above. With all ordinary gas cookers the hottest portion of the oven is at the bottom. Steamers with several compartments over one burner, instead of several pans, each on a different burner, should be employed for this work.

Fuel Stoves. On this page is also shown the "Aga" Cooker. It burns coke or anthracite. For cheapness and general convenience coke is preferred. It is remarkably efficient for a household of no fewer than eight people. For smaller families there are smaller cookers working on similar principles.



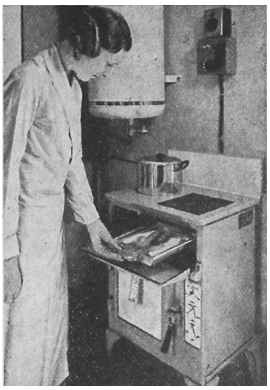
Cooker. Fig. 5. "Aga" kitchen unit, designed on the "heat-accumulation" principle, and insulated so that only the heat necessary to warm the kitchen can escape (Aga Heat, Ltd)

"Heat accumulation" is the idea of this kind of cooker. Food can be well cooked over a small fire, provided that the heat is taken by

conduction and radiation to the various parts of the cooker in the exact proportions required. Large heat-resisting alloy castings inside the cooker are kept, by means of an automatic draught control, at a specific and very high temperature day and night. From these castings the heat is taken to the other parts of the cooker. But the entire cooker itself is insulated so that only the amount of heat necessary to heat the kitchen can escape. Hence kitchens can be cool in summer and warm in winter, with remarkable fuel economy.

Electric Cookers. It may be as well to state that with a properly installed electric cooker there is no danger whatever of shock. Electricity, properly used, is such a convenient form of providing heat, without fumes, smoke or smell that it means cooking under ideal conditions. The heat is always constant and there is saving in weight and value of foods cooked by this method.

Generally speaking there is a cheap rate available of atbut 1d. per unit for cooking purposes, plus a small standing charge based on the rates of the house or whatever the system of the town may happen to be. In the country, however, electricity is often much more expensive. Most supply companies will instal a cooker on simple hire terms, the hire including cost of wiring and fixing.



Cooker. Fig. 6. Shown at 1938 British Industries Fair, this electric cabinet includes 2-bar fire unit for warming kitchen. (Jackson Electric Stove Co.)

The heat can be perfectly regulated and controlled in a satisfactory electric cooker. Each part, oven, grill, or boiling plate, is in the larger models independently switched. Temperature indicators ensure scientifically accurate results. Somewhat similar oven control as the thermostatic for gas cookers is obtainable in the more expensive electric models, by means of an automatically operating time switch. Electric cookers are easily movable, so that they can be placed where required, and are made in various sizes to suit the requirements of the household.

For the very small kitchen or the bachelor flat, a convenient cooker, illustrated on this page, is the small "Magnet." A useful adjunct to this is a fast-boiling kettle, which boils at the rate of 3 pints in 3 minutes. Such a cooker can, and should, be placed in a good light, within easy reach of pantry and table. Cleaning it is a simple matter; to some extent, it cleans itself, as the current quickly burns away any fat splashed upon it. What fat remains is wiped off with a damp cloth while the oven is warm.

A luxury model, of up-to-the-minute design, is the white-enamelled Cabinet Cooker also shown on this page. The rectangular enclosed rapid boiling plates will each take four utensils which can be kept boiling or simmering simultaneously. The spacious hot-cupboard has a spring-loaded door with concealed hinges.



Cooker. Fig. 7. Small thermostatically-controlled "Magnet" electric cooker for general household purposes, comprising oven,grill and boiling plate (British Electrical Development Assn.)

Oil Cookers. For the country cottage, bungalow, camping out, and as an aid to save using a kitchen range daily for light cookery, one of the various kinds of oil-cookers is invaluable. Oil burners may be divided into two classes: Wick burners and wickless (or pressure) burners. The wick burner works on the principle of the ordinary oil lamp used for lighting purposes, having from one to four burners. Fig. 8 shows an efficient type of cooker for family use with three burners, one being a giant burner for rapid boiling. There is a wick-adjusting apparatus, and a glass door to the oven which obviates the necessity of opening the door to see how baking progresses. The cabinet top possesses a plate rack. The double walled chimneys concentrate the heat where it is required. The wicks should be thoroughly cleaned at least once a week by raising them even with the top of wick tubes and scraping the carbon from the top of the wick with a cleaning tool provided with the stove. The wick is then turned down and the screw top removed and any dirt cleansed from the inner wick tube, the screw top then being replaced. It requires from three to five minutes for the flame to reach full height after lighting. The flame should be a clear blue colour and extend above the top of the grate.

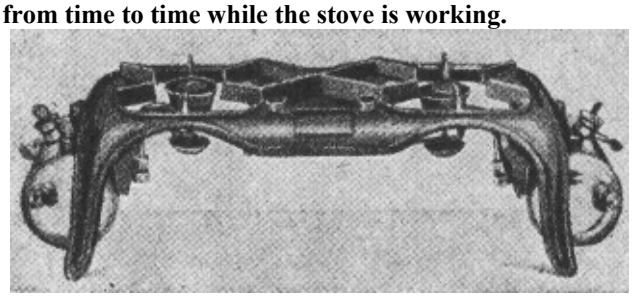


Cooker. Fig. 8. Oil cooker with three burners and having a glass door to the oven.(Courtesy of Anglo-American Oil Co., Ltd.)

The pressure type of oil stove (Fig. 9) burns paraffin without a wick. This type of burner first vaporises the oil by ejecting it under pressure through a small heated nozzle, then mixes it with air, and finally burns it in a rose, not unlike a modern high efficiency gas burner. This type of stove is suitable for camping or for use where baking is not required. It can be furnished with accessories for toasting, etc. A similar stove may be obtained with only one burner. A small oven on legs might be added.

A comparison of the working costs can be made by assuming that each burner, when full on, will use from a quarter to half a pint of paraffin per hour. The pressure type of burner is undoubtedly very

economical, but has two main disadvantages. One is the necessity of heating up the burner with methylated spirits for a few minutes before lighting the stove, and the other is that of having to pump up the pressure from time to time while the stove is working.



Cooker. Fig. 9. Pressure type ot oil cooking stove, which burns paraffin without a wick. (Courtesy of Optimus (London), Ltd.)

The chief cause of all working troubles with oil cookers is dirt. Dirt causes smell, smoke, clogging, and many other ills which accompany such slight details as allowing carbon deposits to form on nozzles, etc.

A good wrinkle with a pressure cooker is from time to time to open the salve after the pressure has been pumped up, but before the burner has been heated. This will force a thin stream of oil through the nozzle and air injector, and carry away any small particles of dirt or carbon deposit.

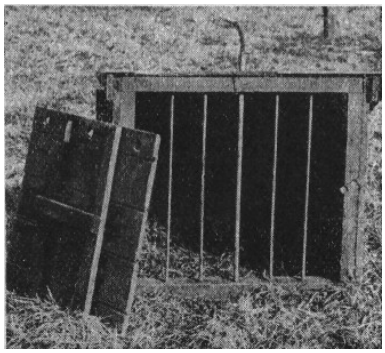
COOKIE. These cakes are prepared by creaming 5 oz. of butter and 6 oz of sugar. Into these beat an egg, then stir in ¾ gill milk, finally sieving in ¾ lb. flour and 1 teaspoonful baking-powder. Roll out the mixture thinly, adding more flour if necessary, and then form it into rounds. Bake the cookies in a fairly hot oven until they are golden brown.

COOKING BOX. When long and gentle cooking is required a cooking box will be found useful, the food being brought to the boil before being placed in the box. To make a cooking box, line a packing-case or sugar box with two or three thicknesses of newspaper, covering the latter with flannel or the type of felting used under stair carpets. Nail this on neatly, and line the lid in the same manner. Make some balls of newspaper, pack them tightly into the bottom of the box to a depth of 3 in., and place the saucepan or casserole on top of them, packing it round with more newspaper balls so that, when it is lifted out, a nest is formed. Should there be room for two saucepans, stand both on the layer of paper, but put a thick padding of paper balls between the two. The cushion or cushions placed over the top can be made of flannel or felting stuffed with paper torn into small shreds. *See* Haybox.

COOLING: Of Rooms. In temperate climates a few simple precautions suffice to keep a room cool on the hottest day. Most important of all is the outside blind, which need not necessarily be a sunblind on an iron frame, though that is the most convenient. Any dark blind which comes outside the window pane answers the purpose by preventing the radiation of the sun on the glass.

Windows should be shut during the heat of the day and the outside blind pulled down. They may be opened again when the heat of the sun has abated, the blinds being then pulled up, provided that the sun no longer shines on that particular window. Where a window may safely be left open all night this should be done, particularly passage and landing windows, which ensure a current of air through the entire house.

Electric fans are of assistance in circulating air and so keeping rooms and passages cool. In rooms with tiled or stone floors, such as sculleries, dairies, and old-fashioned kitchens, a little water may be sprinkled on the floor with a watering-can to cool the air by evaporation. Hyposulphite of soda has a cooling effect when it is dissolving, and some crystals moistened in a dish may be placed on the window ledge and the window pushed up a few inches. *See* Ventilation.



Coop. Useful and effective type of hen coop, instructions for making which are given in the text.

COOP. A coop is a wooden structure, with bars in front, and is used to house a hen and her brood until the latter are weaned. The bars are so arranged that the chickens can have free ingress and egress to an attached run without the hen. The main essentials in a good coop are durability, security against inclement weather and rats, etc., together with ample ventilation without draughts. When rats are troublesome, a floor is necessary; but, when ever possible, a coop should be located on short grass and moved to fresh ground from time to time.

A coop is quite easily made at home, and the design here given has proved satisfactory either as a sitting coop or as the first home for the hen and chicks; it has been devised for use in conjunction with a small portable chicken run.

Made in sections to bolt together, it can be dismantled and packed away during the winter months. The dimensions are given in the accompanying drawings.

The first thing to do is to make up the front (Fig. 1) and back (Fig. 2) frames from deal 1½ in. square, the corners being mortised and tenoned and well screwed. Five ⅜ in. diameter holes are drilled through the front frame and the iron bars driven through the four outer holes. The central hole is used for a movable rod, which prevents the hen escaping, but gives complete freedom for the young chicks.

The door or cover (Fig. 3) is made from ⅝ in. tongued and grooved matchboard, has a batten across the centre, and three 1 in. diameter holes at the top for

COOP

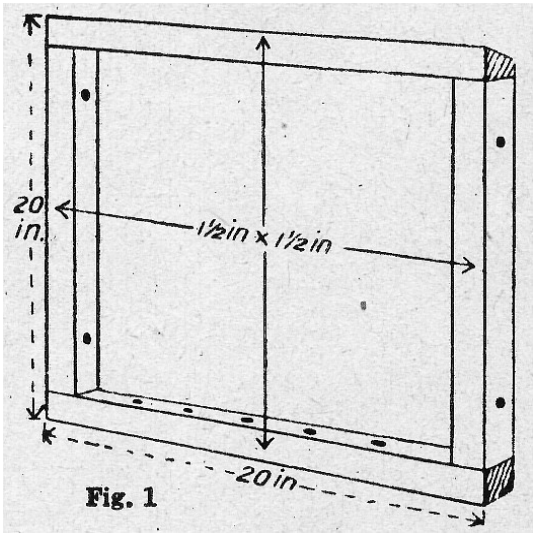


Fig. 1

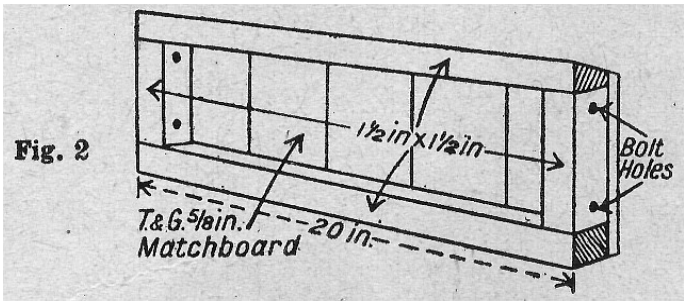


Fig. 2

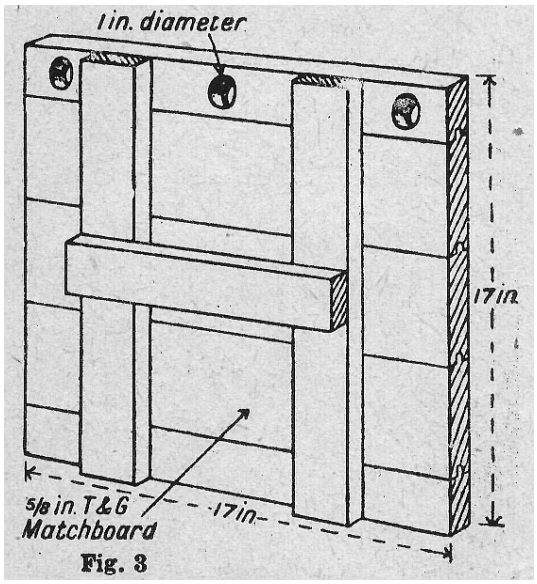
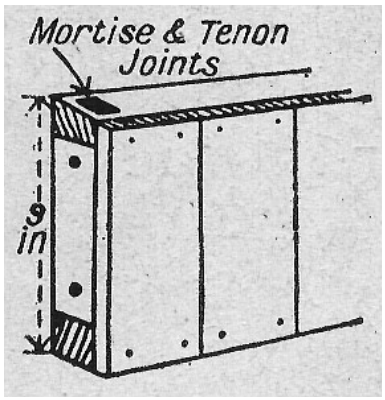


Fig. 3



Diagrams showing how to make the portable coop illustrated. Fig. 1. Front frame. Fig. 2. Back frame. Fig. 3. Door, with three ventilating holes. Fig. 4. Roof. Fig. 5. Side

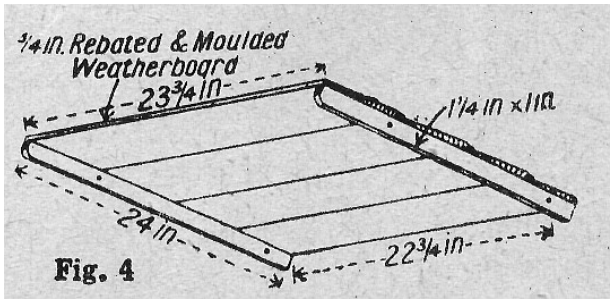


Fig. 4

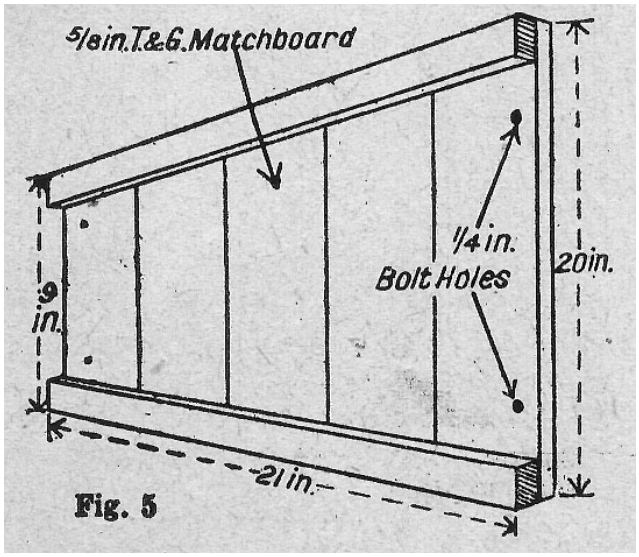


Fig. 5

ventilation. This fits into the front framework, and is kept in place by two turn buttons. The back frame is covered on the outside with ⅝ in. T. and G. matchboard. The two sides (Fig. 5) are made up from similar material nailed to battens 2 in. wide and ¾ in. thick at top and bottom. These must be made up in pairs so that the battens are on the outside. The roof (Fig. 4) consists of four lengths of weather-board, preferably moulded and rebated as shown. It is nailed to the 1¼ in. by 1 in. battens, which are at such a distance apart as will just clasp the sides.

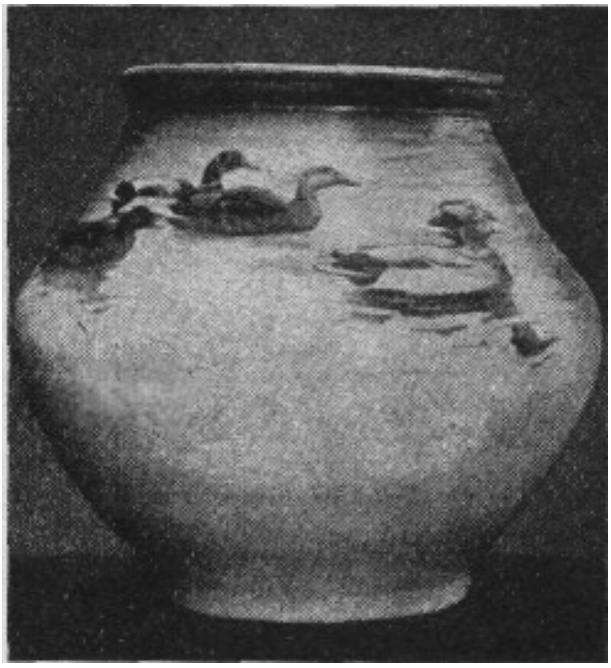
The coop is assembled by drilling ¼ in. diameter holes in the two side pieces, near the front and back at ¾ in. from the edges, corresponding holes being made through the framework of the front and back. The front and back are then bolted in place,
and the roof put on top and secured to the sides with two stout brass screws on each side, passing through the roof battens and those on the side pieces. A hole is drilled through the roof to permit the passage of the movable rod. The resulting coop is shown in the photograph. The best finish is a coating of creosote inside and out; this is a good preservative and an efficient insecticide. *See* Chicken; Poultry.

COPAIBA. An oily resin obtained from the bark of a S. American tree contains a medicinal oil which has been extensively employed in the treatment of gonorrhoea. It has also been found helpful in chronic bronchitis. The dose of copaiba is ½ to 1 fluid dram, and that of the oil is 5 to 20 minims. The oil may be taken in capsules or in mucilage of acacia, prescription consisting of copaiba 2 drams, mucilage of acacia 2 oz., peppermint-water 8 oz. The dose is 2 tablespoonfuls 3 times daily after food. Pron. Co-pā 'ba.

COPAL VARNISH. This hard clear varnish is usually employed in finishing carriage bodies, and because of its durability and brilliance is suitable for all outdoor work, or for indoor work subject to hard wear. Varnish made from the darker tinted copal is in no way inferior to the lighter grades, but it fetches a lower price because its usefulness is more restricted. Colourless varnish can be used for covering very delicate colours, but the deeper coloured variety is only suitable for such purposes as varnishing wall-paper or for dark woodwork where the yellow tinge will not mar the body colour.

Oil should on no account be added to varnish, or it will be found almost impossible to get it to dry. Thinning should be accomplished with turpentine. The varnish should be stored in dry airtight vessels. *See* Varnish.

COPENHAGEN WARE. The hard porcelain produced at the Royal Copenhagen factory stands in the front rank of technical precision and decorative excellence. Employing a high percentage of pure Swedish crystallised felspar, combined with fine china clay which is obtained from Cornwall and elsewhere, it yields a singularly limpid white ware.



Copenhagen Ware. Vase with characteristic pattern. (Courtesy of Danish Art Glleries, London)

Copenhagen ware dates back to 1772. Its most character-istic designs, in cool, under-glaze blues, greys and greens, are sometimes based upon the virile motives of Scandinavian art, sometimes suffused with Japanese feeling, and these are imitated by Japanese potters themselves. Besides dinner and tea services, there are charming figures of birds, fishes, and the like, both in white biscuit and in subdued tints, together with reproductions of Thorwaldsen figures and reliefs. The mark is a triple wavy line in under-glaze blue. *See* China.

COPPER: The Metal. Although displaced to a great extent by aluminium for cooking utensils, copper is still used for preserving pans, kettles and moulds, while for other household purposes, such as accessories for the fireplace, and for appliances such as geysers, boilers and electric fittings, it is a satisfactory metal. Extremely ductile, malleable and tenacious, it is the best known conductor of heat and electricity. It possesses a beautiful colour, and if suitably chosen for decorative objects may enhance a room.

For culinary purposes the drawback to its use, besides the initial expense of copper articles, is that acids on its surface form poisonous salts. To obviate this, cooking vessels should be tinned on the inside, as tin does not form salts, nor is it acted upon by weak acids or other substances met with in articles of food. Utensils such as kettles and coffee percolators are satisfactory in copper; they rarely need returning, as there is nothing in their ordinary use to wear the lining. It is an economy to have a tinned iron kettle with a copper bottom.

If kept scrupulously clean and well dried after washing there is no danger in using un-lined copper

preserving pans and moulds. If allowed to remain dirty or moist the two chief poisonous salts which might form are verdigris and copper carbonate. The first is formed by the action of vinegar on this metal, the second on wet copper by the action of carbon dioxide, always present to some extent in the air.

Cleaning Methods. Decorative articles or those partly decorative and partly utilitarian, like fireirons, knockers, coal scuttles, etc., are usually covered with a lacquer when new, chiefly composed of shellac, coloured, and dissolved in alcohol. This solution is painted on to the article and prevents tarnishing and oxidisation. As long as the lacquer remains, no cleaning is necessary. Any good metal polish that does not corrode can be used for articles not employed for culinary purposes, e.g. hot pipes and geysers.

Cooking utensils require special care in cleaning. Scouring with silver sand and soap is an excellent method. When the copper has been well rinsed and dried, a brilliant polish can be obtained by rubbing over a little paste made of whitening and water. Bath brick moistened with water and soap or any other gritty cleaning powder can also be used for cleaning.

The Manipulation of Copper. One or two practical hints may be serviceable to the amateur craftsman who desires to undertake work in copper, for it has peculiarities that render it easy to work in some ways and more difficult in others. It is easily bent, curved, or beaten to any desired shape or bent to acute angles without fear of cracking. For ornamental purposes it is embossed and worked up into plaques and decorative panels. When a plain lathe is available sheet copper can be spun into circular forms, such as flower-bowls. But the metal is difficult to machine, as it is liable to tear; drilling and sawing are more troublesome than with brass. Copper adheres to and clogs the cutting edges of tools, and it is therefore necessary to use a lubricant, either milk or tallow or a mixture of lard, oil, and turpentine. To file copper without tearing the surface French chalk should be employed as a lubricant.

Do not use copper for bearings or on working surfaces, as it is difficult to keep it from seizing, and it would speedily wear away. Copper wire is useful for binding metal fittings to hose pipes, for the fastening of rods and canes, and any purpose where a secure joint is needed more durable than one made with string. A difficulty sometimes is the selection of a suitable gauge of metal for a particular job. In general copper pipes are satisfactory in Nos. 18 or 16 gauge; sheet copper for spinning in No. 22 gauge; for beaten metal work about No. 24 to No. 20 gauges will be found to answer very well.

Copper nails and rooves are used for making joints between the planks of small boats, and can be used for other purposes where an iron or steel nail would be objectionable on account of rusting, as for lead flushings or gutters. Small copper rivets and washers, or burrs, are invaluable for making riveted joints in sheet metal, and are available in convenient sizes at most ironmongers. Thin sheets of copper can be pierced by sawing with a fine metal-cutting fret-saw, by punching, or by cutting with very keen cold chisels.

Sometimes the amateur is confronted with a damaged piece of copper, such as a cracked pipe. In general the best method of repair is by silver soldering or brazing. To solder copper with ordinary soft solder, it is first necessary to tin the surfaces to be united. When hard or silver solder is used the borax is generally applied to the joint, and the silver solder melted by means of a blow pipe (q.v.), heat being applied until the solder has flowed properly into the joint. The brazing of copper requires care, as the melting-points of the copper and the spelter are very nearly alike. For all ordinary small pipe joints, such as those found in motor vehicles or in hot-water installations, silver soldering is preferable to brazing.

How to Bend Copper Pipes

The bending of small copper pipes can often be satisfactorily carried out with the hands alone, especially if the copper be soft or well annealed. If the bends are very sharp it will be desirable to grasp the pipe between two pieces of wood held in the vice, and tight enough to hold the pipe, but not so tight as to crush it. The object is to prevent the tube from buckling or flattening. The pipe can then be pulled into shape by slipping a larger-size pipe over the outside where it is desired to keep it straight. This localises the pressure and whereabouts of the bend. Pipes about ½ in. diameter and upwards are generally bent in a pipe-bending machine, or are filled with sand, which must be rammed hard and the ends securely plugged.

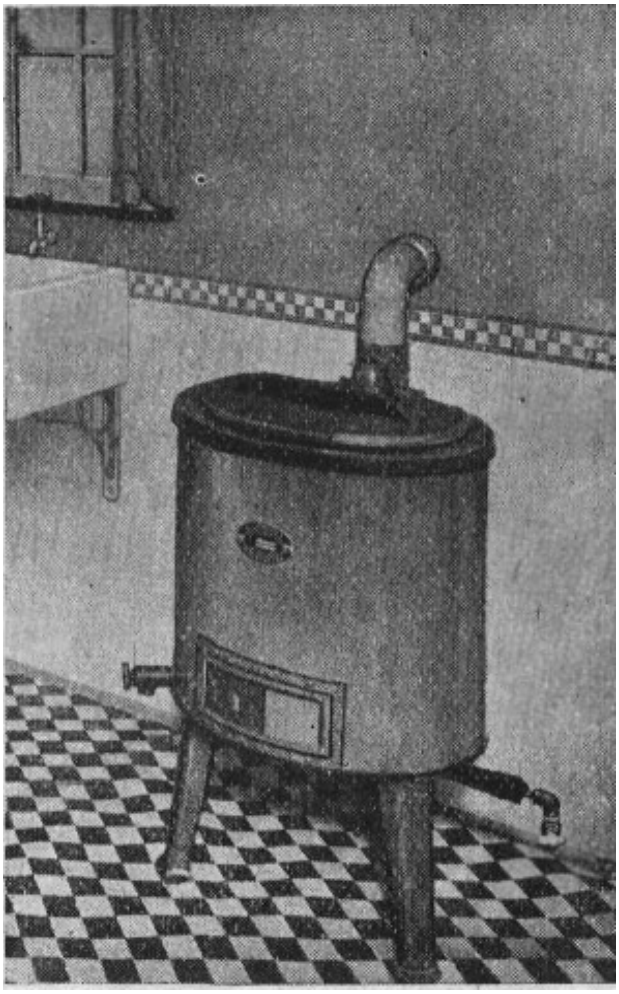
The annealing of copper for amateur use is a very simple matter; merely heat the copper to a uniform dull red heat and immediately plunge it into cold water, and leave it to cool. If any hollow work has to be annealed, take special care to avoid the escaping steam.

COPPER: The Boiler. A washhouse boiler, generally made of galvanised iron, is known as the copper, and the best sorts are in fact made of copper. There are two types: one is built into a brickwork furnace, and is found generally in older houses: the other, the portable type, consists of a metal exterior that supports the inner pan or copper. The bottom part is adapted to receive a gas burner, a high-pressure oil burner, or an ordinary coal or wood fire. Some patterns have removable pans, a draw-off tap, and a steam escape pipe connected to the flue pipe.

To instal a portable copper the only fitting necessary is to provide a good, solid, fireproof base, and to see that no part of the copper is near any woodwork or inflammable material. The smoke box terminates in a socket, into which is fitted the cast-iron or sheet-iron stove pipe, which is preferably taken directly out to the air by breaking through the brickwork of the wall, and then fitting a canister elbow with an inspection door in it, and carrying the stove pipe upwards to a point some 3 ft. above the level of the roof and terminating in a

cone cowl.

The inside of a copper should be thoroughly washed and dried, and any signs of rust carefully guarded against. If greasy, it can be cleaned with paraffin and soft soap, then scoured, and afterwards rinsed with hot water. Coppers should be filled before the fire is lighted, and emptied after the latter has been put out. Coke and cinders, being cheaper than coal, are frequently used as substitutes for the latter in copper fires. *See* Laundry.



Copper or boiler for washing clothes, heated by a gas burner.

COPPER NUCLEINATE. The organic preparation of copper known as copper nucleinate is made by combining its oxide with nucleol, a substance obtained from yeast. It is a fine powder and 5 to 10 per cent solutions have been found useful in various forms of conjunctivitis (q.v.), for example, trachoma or granular ophthalmia. This preparation is known also as cuprol.

COPPER SULPHATE. In medicine copper sulphate is sometimes used externally as a caustic or internally as an astringent or as an emetic. As an astringent the dose is ¼ to 2 gr. and 5 to 10 gr. as an emetic. It is a useful emetic in narcotic poisoning and in acute phosphorus poisoning. As blue stone it is used in reducing "proud flesh." In styes, after pulling out the affected eyelashes the parts may be bathed with a 1 per cent solution every hour or oftener. The lashes will grow again in the course of time.

Poisoning by copper sulphate produces vomiting, abdominal pain and more or less shock. The doctor should be sent for. The vomiting should be encouraged by copious draughts of tepid water. White of egg or rich milk should be given after the stomach has been thoroughly emptied. Rest in bed, with warmth to the feet, and stimulation by tablespoonfuls of hot strong coffee comprise the rest.

COPYING: In Photography. In copying pictures, photographs, engravings, and printed matter, it is necessary to use a ½-plate or larger camera with a good lens and a ground glass focussing screen. If a smaller camera is used it will generally be necessary to make enlargements from the negative, which will not always give results as good as direct prints from larger negatives. Roll film cameras cannot be used, and the best results will be obtained with backed plates.

Very short focus lenses are unsatisfactory for this work; but the longer the focus of the lens the greater must be the extension of the camera bellows.

The print to be copied must be fixed in an absolutely vertical position and the camera pointed squarely at it, otherwise some portion of it will not be sharply in focus. The original may be pinned to a door or wall. A good working arrangement is illustrated in Fig. 1.

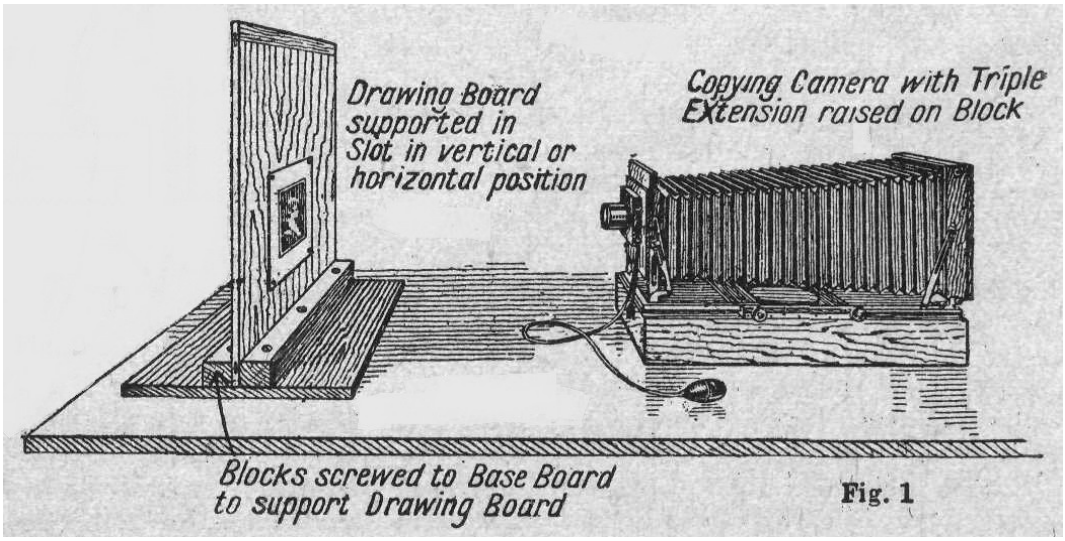
The best arrangement for regular work is to have the camera in a fixed position, square to the easel, the easel itself being supported on runners so that it may be moved backward and forward in line with the camera, according to the size of the original to be copied. The final focussing is then done with the camera.

The lighting is of the greatest importance. Light must be evenly distributed over the whole subject. Perhaps the best is obtained out of doors on a north wall (not in the sunlight). Indoors, a room with a good north window will serve if care be taken that the camera itself cuts no light from the object.

Artificial light is satisfactory if properly arranged and controlled. Two lights of equal strength, placed on either side of the copying board and shielded from the camera lens (Fig. 2, A and B), or one strong light immediately above the centre of the camera (Fig. 2, C) may be used. Electric light is easily arranged with sufficient flex. Magnesium ribbon is one of the best artificial illuminants. Two pieces can be burnt simultaneously, as at D and E (Fig. 2), or one, centrally, as at F (Fig. 2).

An excellent way of using magnesium is to erect a screen of tissue paper, with the camera lens projecting through, and burn about a foot of ribbon behind it, moving it about during the exposure.

COPYING



Copying. Fig. 1. How to arrange camera and copying board.

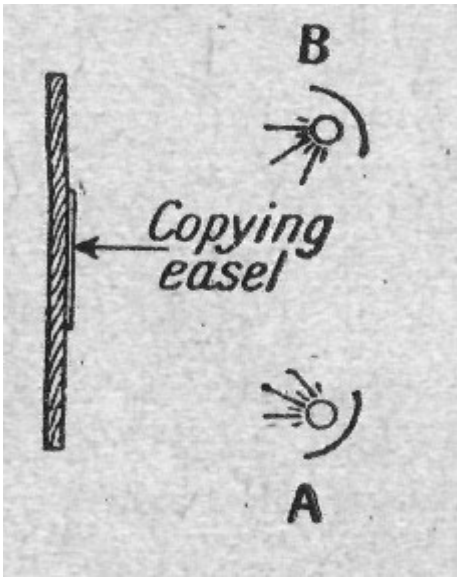
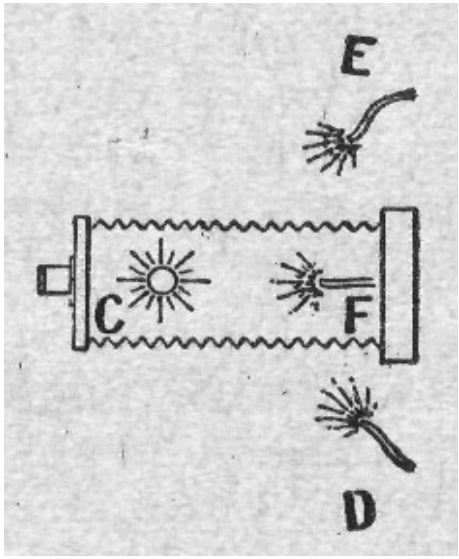


Fig. 2. Method of arranging artificial lights to secure even illumination of the object being copied.



To test evenness of illumination when two lights are used, place a pencil in front of each light. The shadows ought to be of equal depth. If on looking at the original through the focussing screen or over the top of the camera any reflection of the light from the surface of the original is seen, the light must be diffused by means of tissue paper, or a thin handkerchief held in front of each light. Altering the position of the lights will also reduce the trouble.

Panchromatic Plates. If the picture to be copied contains much colour (especially reds, browns, yellows, or greens), colour sensitive or panchromatic plates must be used in conjunction with a light filter in front of the lens. Similarly, if an old print has brown stains (foxing), or an old photograph is yellow and faded, much the best results will be obtained by using panchromatic plates and a light filter. An old photograph should first be cleaned by rubbing with cotton-wool, part of the aged appearance being due to dirt. Exposure in copying is largely a matter of trial and error, but, in general, there is little risk of over-exposure. Out of doors an exposure meter can be used. Indoors, near a good north-lighted window, at mid-day in bright weather, using a stop of f 16, ordinary medium speed plates, from ½ to 1 min. would probably be sufficient.

With artificial light from 2 min. to 2 hours may be required. It is best to waste a plate at first on a trial exposure. Drawing out the slide about ¼, a minimum estimated exposure of, say, 5 min. with a strong light may be given. Exposing each successive ¼ of the plate for double time, i.e. starting with 5 min. and then giving 10, 20 and 40, the correct exposure can be judged after the plate is developed and printed. Thereafter, if the same lights and the same plates are used and the same distance kept between camera and copying board, no difficulty will arise. If it is necessary to make copies in different sizes, reference should be made to tables of relative exposures in a photpgraphic text-book. It is particularly desirable to keep to the use of one kind of plate in copying work to obtain uniform results. *See* Blue Print; Panchromatic; Photography.

COPYING INK. A special ink is used to copy letters by pressing them upon damp tissue paper. This copying ink is best made by evaporating 10 volumes of ink until reduced to 6, and adding 4 volumes of glycerin. Sugar candy dissolved in the ink may be used in place of glycerin. Ink for copying pads or hectographs is made by dissolving methyl-violet aniline dye 1 oz., in a mixture of water 7 oz., and methylated spirit 1 oz. *See* Ink.

CORAL: For Wearing. The value of coral, which is fashioned into many pretty articles of jewelry, depends upon its colour and upon the high polish which its close, hard texture permits it to take. It varies from a deep red to a delicate rose or flesh tint, and sometimes a milk-white variety is obtainable Coral is essentially suited for children's ornaments. A string of pink coral beads is a favourite christening gift from godparents to a baby girl.

CORAL SPOT. No fungus is more plentiful on dead twigs and dead branches and more familiar to every gardener than the coral spot. It is abundant and conspicuous in damp weather on dead branches of elm, lime, poplar, sycamore and many other trees, and is always to be noted plentifully on old pea-sticks, particularly hazel, in autumn and winter. The coral spot fungus may be recognized by the small pink or flesh-coloured warts which are thickly scattered over the surface of the dead and dying branches. The warts are spore-pustules, which consist of fungus filaments bearing masses of spores.

On fruit trees coral spot is particularly common on red and black currant and gooseberry, but it also attacks apples and pears. The fungus gains entrance in two ways, viz. , through dead branches and through wounds. All dead shoots and branches should therefore be removed during pruning and care taken that no snags which will die back are left. Injury to bushes should also be avoided, whether in pruning or in cultivation with the hoe. Wounded surfaces should be protected by tar. Diseased branches should be cut clean out, taking care to cut back to healthy wood and to protect the wound.

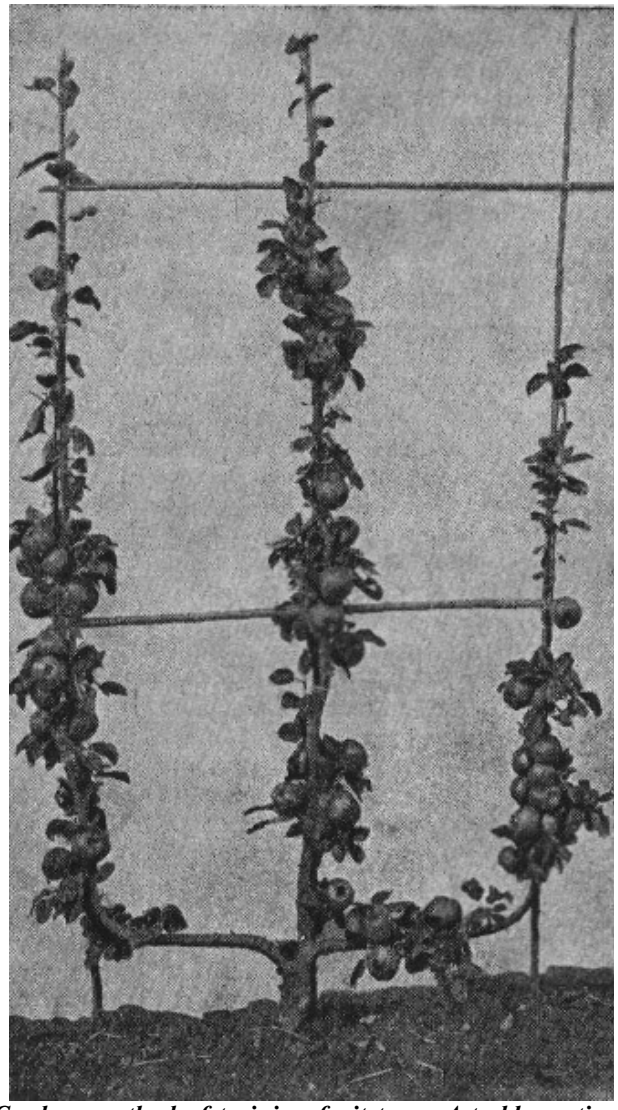
Accumulations of dead wood and sticks should never be allowed in an orchard. On such debris fungi of all sorts flourish, and millions of spores are liberated and blown amongst the trees. The better the sanitary condition of the orchard, the less the chances of infection by fungus parasites. This information is taken from Leaflet 115, issued by the Ministry of Agriculture. *See* Apple; Black Currant; Gooseberry; Peas; Red Currant, etc.

CORBEL: In Architecture. This term is now used of any masonry built in tiers outwards from the plane. Even the upper storey of a house that overhangs a lower storey may be said to be corbelled. In modern building, however, the term is chiefly employed in connexion with purely ornamental features, generally stonework, but sometimes timber, on the exterior of a house, and is rarely seen except on structures of some pretensions. In the latter a corbel support for an oriel window sometimes affords effective relief to the façade of a house.

In brickwork corbelling is a method of laying bricks where one or more courses project above the others. Corbelling reduces the stability of the wall, unless compensated by a beam or floor joist, spanning the space between two walls. *See* Brick.

CORD: How to Purchase. Wholesale, the cheapest way to buy cord is in a 50 yd. hank. The poorer quality cord is used for clothes lines, which should be well washed before use, to prevent the clothes from getting soiled. The better quality cords are used as sash cords, blind cords, for hanging pictures

and binding cushions. Thick cord is necessary for window sashes, and for this purpose a special kind is sold. Linen blind cord has two qualities. It can be purchased in white, green, crimson and brown. Upholstery and cushion cord is sold by the yard in any colour. Fancy cords of twisted silk and silk mixtures are used in fancywork and upholstery. Piping cord is used in gauging cushions and to cover seams in dresses, etc. *See* Airer; Blinds; Clothes Line; Picture; String.

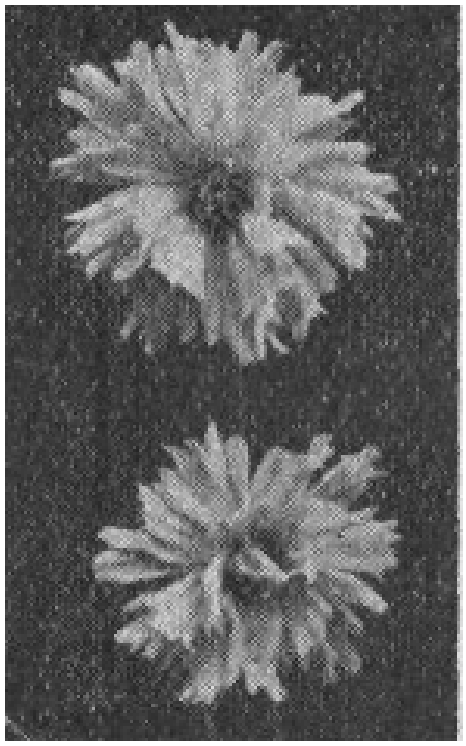


Cordon: method of training fruit trees. A treble vertical apple is here shown.(Courtesy of Laxton Bros.)

CORDON: For Fruit Trees. These are invaluable for small gardens, for they take up little room and produce first-class fruits. There are both upright and horizontal cordons. The single-stemmed upright cordon is chiefly grown, though each tree may be trained with two or three stems. The horizontal cordon, which is very useful for planting alongside a garden path, has a stem about 12 in. high and one long branch, trained horizontally, on each side. Single-stemmed upright cordons may be planted at 18 in. apart, those with two or three branches must obviously be placed farther from each other. Instead of being perpendicu-lar, the branches are often trained at an angle of 50 degrees to prevent the growth becoming vigorous at the top and weak at the base.

Apples and pears are chiefly grown as cordons. Plums do not flourish in this form Gooseberries and red and white currants do well as cordons. The trees may be trained against a trellis in the open border or on a wall. Cordons must be hard pruned or they will soon cease to be cordons. The side shoots which grow in summer are pruned to within about six leaves of the base in late July, and these shoots are again shortened in winter, leaving only two or three buds. As the trees age the fruit spurs will become large, and a few of them ought to be cut back every year. Summer growth at the top of the cordon is pruned by about two-thirds every winter until the tree has reached the desired height. It must then be treated in the same way as the side shoots. Vigorous varieties of apple and pear are not so suitable to grow as cordons as those of moderate vigour. *See* Apple.

COREOPSIS. The annual and perennial coreopsis are very free-flowering hardy plants; they yield a wealth of long-stemmed flowers in summer. The best of the perennials are grandiflora and auriculata superba, both having yellow flowers; they are, however, not long-lived,, and it is usual to treat them as biennials and raise a fresh lot of plants each year. Seeds are sown out of doors in June to provide plants that will flower the following year. The seedlings are set in their final position in October. The annual forms of coreopsis are sown out of doors in March—April, where they will bloom from July onwards; tinctoria, yellow, atrosanguinea, dark red, and Drummondii, yellow, are some of the best.



Coreopsis. Golden-yellow flowers of Coreopsis grandiflora.

Corer. *See* **Apple Corer.**

CORIANDER. Flourishing in light, warm, sandy soil, coriander is a hardy annual which produces white flowers on stems 1½ to 2 ft. high in June. As it soon runs to seed, those who want a continuous supply should sow at intervals from March onwards, and thin to about 9 in. apart. Coriander is almost exclusively grown for the seeds, which are used in the manufacture of liqueurs such as kümmel.

It is also used in medicine, the dried ripe fruit being an aromatic and carminative It yields an oil, of which the dose is ½ to 3 minims. This is used in some of the preparations of rhubarb and senna to prevent griping.

Coriander is also used for flavouring confectionery, and forms one of the chief ingredients in the making of curry powder. The leaves may be used in salads.

CORK: For the Home. The light, porous bark of the cork-oak has numerous applications in industry, and is chiefly found in the domestic sphere in the form of stoppers for bottles, floats for fishing-lines, and cork mats. For the latter purpose it is prepared as a composition. Cork linoleum is an instance of its use in industry. The amateur can repair cracks and bad places in cork linoleum by using a paste composed of finely powdered cork and shellac varnish or hot beeswax. This is pressed into the cracks and smoothed off with an iron bar, warmed to prevent the shellac chilling too quickly. Colouring pigments may be added.

A cork that is a little too large for the bottle may be made to fit by rolling the cork on the floor and pressing upon it with the sole of the boot. When a cork becomes lodged in the neck of a bottle an effective way of loosening it is to hold the neck before a fire, or to wrap it up tightly in a thick piece of cloth which has been previously heated. This will have the effect of expanding the glass slightly, and the cork will then come out readily.

Cleaning Hints. Instead of throwing away old corks it is worth while to collect them in a box, because of their practical value as cleaning agents. A cork dipped in paraffin is effective in removing rust from metal and stains from lamp-glasses and hearth-tiles, while disfiguring marks on polished wood and also on wall paper and window-panes will often yield to treatment with a dry cork. Stains on aluminium and enamelled saucepans can be removed by means of a cork dipped in salt, and kitchen knives, together with any cutlery not made of stainless steel, are best treated with a moistened cork rubbed along a bar of household soap. Burnt marks on plates can be removed by means of a cork dipped in a little damp salt; spots on linoleum disappear when rubbed with a cork repeatedly dipped in benzine or petrol. *See* Bottle; Bung; Cramp; Linoleum; Mat.

CORKSCREW. The ordinary corkscrew made with a wooden handle and a twisted wire worm or screw does not always get a sufficiently powerful grip on the cork, and sometimes pulls out, leaving the cork in the bottle. Another type of all-metal corkscrew has a cast metal handle with ears at the side to provide a powerful hold.

Many kinds of self-extracting corkscrews have been evolved. In one characteristic type the worm is driven into the cork by turning the handle at the top. This drives the cage down until it engages with the top of the bottle. Further rotation of the handle draws the cork out of the bottle, this being accomplished by the screwed shank of the worm itself, which winds its way up the cage, bringing the cork with it.

In the absence of a proper corkscrew a cork can often be drawn by screwing a stout wood screw into it and grasping the head with a pair of pincers. Another method is to insert two knife blades between the cork and the neck of the bottle and on opposite sides of the cork. By grasping both knife handles with a cloth the cork may be removed with a screwing motion. *See* Bottle.

CORK SOLE. These inner soles are usually made of compressed granulated cork, covered with felt, and are used either to secure increased warmth for the feet in cold weather or to fill footwear which is slightly larger than required. The comfort attendant upon wearing cork soles can be increased by fixing them to the soles of the boots with dextrine paste.

Cork soles can be manipulated to afford some relief from the tortures of an enlarged toe joint or a callus on the sole of the foot. Remove the stocking and moisten the affected joint or the hardened skin so that when placed upon the cork sole their exact position will be clearly indicated. With a sharp pocket-knife cut away the part of the sock marked, slanting the knife so that the edge of the cut will slope outwards. Sockets will thus be formed that will relieve all pressure upon the affected parts.

A common fault in walking, namely, treading over the heel, can be cured by a cork half sole cut as follows. Procure a piece of cork ⅜ to ½ in. thick, as long as from the heel to the ball of the foot and half as wide as the tread. With a sharp knife cut this on one edge to the shape of the foot. This should be pasted into the boot with dextrine on the side which is usually trodden down. *See* Boot.

CORN: How to Remove. Pressure or prolonged rubbing on the toes or soles of the feet causes thickening of the skin into painful circular swellings with a core or eye in the centre These are hard corns, but where the feet perspire freely soft corns may develop. Tight boots are a common cause of trouble, and before anything can be done they must be exchanged for boots that fit easily and so relieve the pressure. Ridges, creases, or lumps inside boots may be responsible for corns, and in such cases the boots should be sent to the shoemaker for attention. Often a pair of cork soles is of assistance.

Corns are removed either by cutting or by applying a plaster or solvent of which salicylic acid is generally the base. It may be used in the form of salicylic collodion, collodium callosum, or salicylic plaster 10-40 per cent. The collodions are painted on and allowed to dry. If the plaster is used, a piece sufficient to cover the corn is applied and kept in position by a strip of adhesive plaster. These preparations may be left on for 4 or 5 days, when the softened skin is peeled off, and another application made if required. If necessary, the foot may be soaked in hot water to get the dressing off.

The removal of corns with a razor or knife requires some skill and care. If bleeding occurs an antiseptic dressing should be applied to prevent poisoning of the wound. For soft corns socks with separate compartments for each toe, similar to gloves, may be worn or pads of cotton-wool may be placed between the toes during the day. The thickened skin should be removed by applying a salicylic plaster, or a little piece of felt with a central hole to fit over the corn may be used to separate the toes, the hole in the centre being filled with powdered salicylic acid, The skin between the toes should be frequently washed and carefully dried and painted once a day with spirit of camphor. A zinc powder may then be dusted on. *See* Bunion; Chiropody; Foot.

CORNCAKE. These cakes are of American origin and are made of the best yellow maize meal. Mix together 1 breakfastcupful each of maize meal and milk, quarter of a cupful sugar, half a teaspoonful salt, 3 level teaspoonfuls baking powder, 1 well-beaten egg, and 1 tablespoonful warmed butter. Blend all these very thoroughly and spread the mixture in greased tins until they are half full, baking them in a hot oven.

CORN COB. These green cobs should be cooked quickly after they are cut, as they soon deteriorate. Remove the husks and strip off every thread of the silky fibre. Take some of the cleanest of the husks, wrap these round the cobs, and tie them in place. Lay the cobs in boiling, slightly salted water to cover them, and cook them quickly for about 10 min. after the water reboils. When nearly cooked, try one of the kernels to see if the raw taste is destroyed; if so, drain them at once from the water, or the kernels harden and lose flavour. Then remove all the outer husks and serve the cobs on a hot dish with oiled butter, seasoned with cayenne and salt. When eating the corn, score each row of kernels through with the point of a sharp knife, pressing out the centre of the grains with the teeth or the knife, and leaving only the indigestible hulls on the cob.

Another way to prepare the green cob is to make it into fritters or rissoles. Grate or chop the grain finely, allowing to every breakfastcupful 2 eggs, 1 dessertspoonful of melted butter, twice that amount of milk, and about a tablespoonful of flour. Beat the eggs well, and while still beating them slowly drop in the grated corn. Season the mixture, then add the melted butter and the milk, and bind the whole with the flour. Form it into round flat cakes, and fry them in hot fat. This dish should be served very hot. The unripe grains of the corn cob are roasted to make pop-corn, while hominy, maize meal and cornflour are all products of the ripened ear. *See* Cornflour; Hominy; Maize.

CORNED BEEF. A round of beef is required, and this must be pickled and then slowly simmered. To pickle the beef, 2 quarts water to ½ lb. common salt, 3 oz. brown sugar, and ½ oz. saltpetre must be used. These ingredients should be boiled together for 10 min. and then skimmed and strained. When the liquor is cold the meat should be immersed in it and allowed to remain for about 10 days. The use of an earthenware vessel is advisable for this process. After the 10 days' immersion, the beef should be boiled up with sufficient warm water to cover it, simmered gently for 2-3 hours, and lifted out when cooked. *See* Beef.

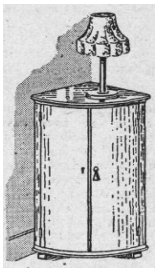
CORNER CUPBOARD. *(For diagrams see pg. 537).* The corner cupboard is a cupboard made to fit in the corner of a room. It originated in the 18th century, and soon became a decorative piece of furniture. It was made of oak and mahogany, and some had a glass and some a solid front. Many were inlaid with ebony, box and satinwood. Instructions for making a hanging corner cupboard in the Chippendale style are given in the article Cupboard (q.v.).

A corner cupboard as shown in Fig. 1 is of service in utilising space that would otherwise be lost and often furnishes an awkward blank. It can be tastefully handled without elaborate construction, and whether finished with a straight or bow front, should not set up undue difficulties. The height from ground to table top is 3 ft. and depth on angle back to front is put at 1 ft. 6 in., which will give a width over front of 2 ft. 1 in. These sizes can, of course, be altered slightly to meet individual requirements.

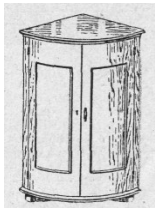
The style of the cupboard would agree with Chippendale furniture of the earlier period, and either walnut or mahogany would be a suitable wood to use. Oak, stained to a nut-brown colour and with panels bevelled, would achieve a good result. The cupboard can also be made of birch, American whitewood or pine, painted green, grey, fawn or pink, to suit the colour scheme of the room in which it is used. The cupboard can, of course, be constructed to size in several slightly varying ways, and it is rather with the lighter and cheaper method that these details and notes are offered, the enlarged sketch of cabinet front (Fig. 2) giving an alternative finish to Fig. 1.

The top (A, Fig. 3) can be of ⅜ in. thickness (or even ¼ in. hardwood if of picked wood, sound and dry) glued up of narrow boards with the grain reversed, to cut 1 ft. 7½ in. by 1 ft. 7½ in. on the angle. The frame front (B) is finished hollow mould, as indicated, to a curved line showing 3 in. to 4 in. projection in centre, and the top (A) will follow this line with ¼ in. projection beyond it. *(Continued in page 538)*

CORNER CUPBOARD



Left. Fig. 1. Bow-fronted cupboard.
Below. Fig. 2. Alternative design for the bow-fronted cupboard.



Figs 3-12. Diagrams showing how to make the corner cupboard illustrated.

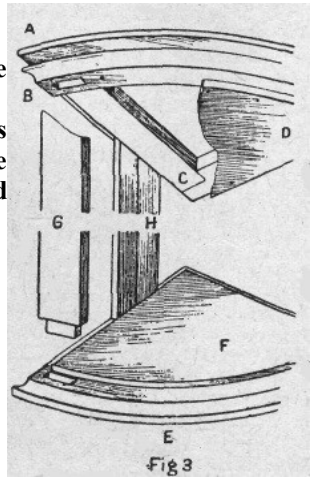
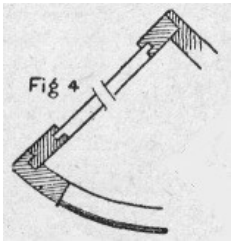
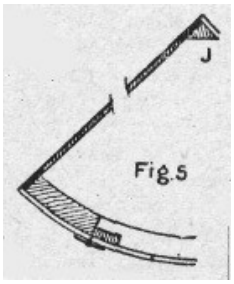
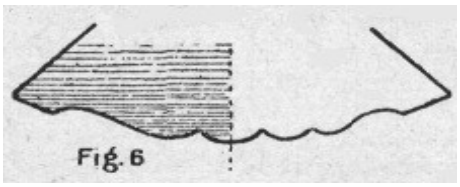
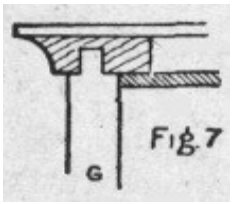


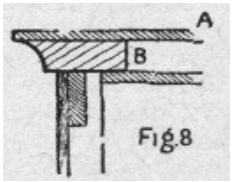
Fig 3

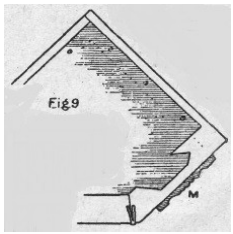


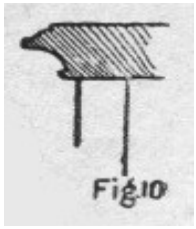


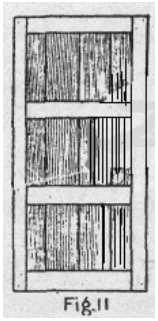


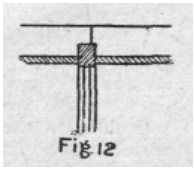












CORNER DRESSER WITH WORKING DIAGRAMS SHOWN BELOW.

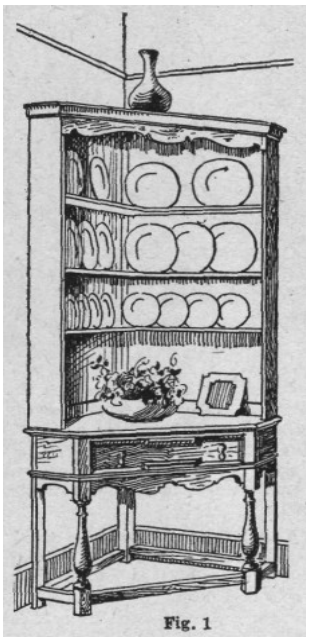


Fig. 1

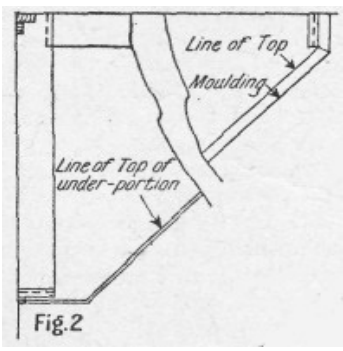


Fig.2

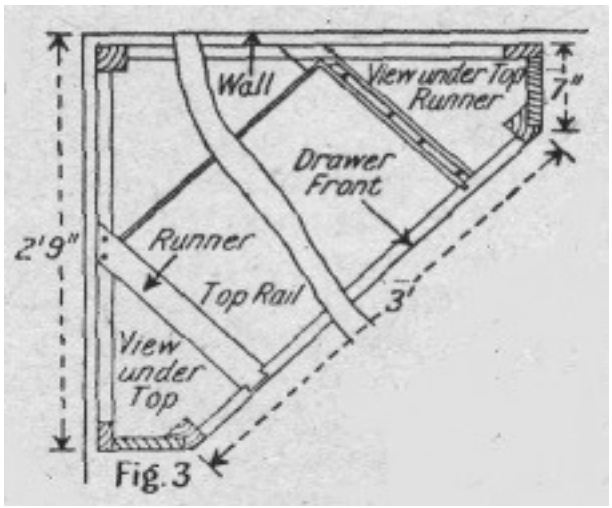


Fig. 3

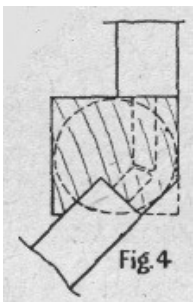


Fig.4

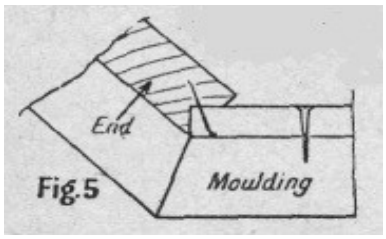


Fig.5

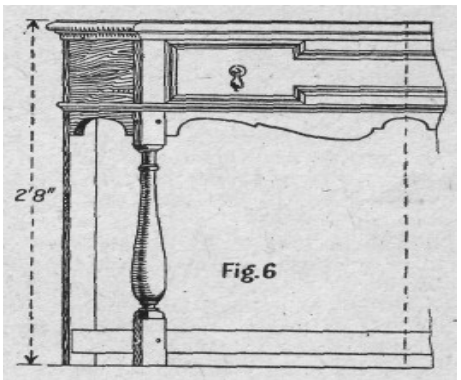


Fig.6

The piece will be finished ⅞ in. thick, making (with the top) 1 ⅛ in. thick. It has a mortise cut in each end. A length of material 2 ft. 3 in. by ¾in. net will allow for paring to shape. The angle battens (C) are rebated into each other in the corner at back and halved into B at front, the mortise being cut through both. Pieces 1 ft. 6 in by 3 in by ⅞ in. net will answer for these; they are set in ¼ in. from angle edges of top (A). The inner lining of top (D) can be of ⅜ or ¼ in. thickness, cut to finish flush with angle edges of C, but set in sufficiently under B to serve as a stop for the doors to close against when hinged. The bottom frame (E) can be put together in a similar manner of material about 1½ in. thick, the bottom (F) being glued and panel pinned down to serve as a stop for doors in line with D above. The upright (G) finishes 2¾ in. by ⅞ in., or in pine had best be made up to 1 ⅛ in. thickness, with ¼ in. hardwood facing. A length of 3 ft. will include joints and paring.

The angle sides (H) of ⅜ in. or ¼ in. thickness, tongued or butted together, can be nailed into rebate top and bottom or can be grooved in. The part plan (Fig. 5) refers to the above and indicates, in the wall angle, an uptight (J) tenoned top and bottom in similar fashion to G, of material 1½ in. by 1½ in. or so.

The doors, as Fig. 2, with flush fronts to finish in line with uprights (G), are made up on a framing in the manner indicated by Fig. 11. Two uprights 1⅛ in. wide, and three rails, say 2 in. wide, are halved and screwed together. The rails can be cut to shape from the solid, or laminated on a template to finish ⅝ in. thick in oak or other hardwood, and ⅞ in. in pine. They are then faced with stout three-ply or ¼ in. hardwood boards, which require to have the meeting edges slightly bevelled to obtain a good joint.

Details of Door Construction

The material used should be thoroughly well seasoned, and the surface of door can be veneered. The angle of bevelling is easily ascertained from the working drawing by a pencilled line connecting the set-out of meeting edges with the centre from which the front curve is struck .The doors are hung on uprights with fancy plate hinges of the Queen Anne type, or a form of strap hinge could be adopted. In the design illustrated at Fig. 1, a three-beaded fillet, to finish with ⅛ in. projection beyond face of doors, is fitted to the meeting edges in centre, size being ⅜ in. by ⅜ in. thick. *(See* detail in Fig. 12.)

A more substantial method of construction is indicated by the part plan (Fig. 4). In this way the angle sides are framed up by mortise and tenon and grooved for panels to finish flush inside, the whole being tongued into the uprights (G) and rebated together in the wall angle. Both bottom and top are then rebated and dovetailed flush into the frames and pilasters and afterwards screwed. A little relief, in a simple way, can be given to the uprights (G) by mounting a length of moulded flat after the manner indicated at M, Fig. 9. This also indicates the cabinet as finished with a straight, instead of a shaped front, the doors being of the usual mortise and tenon type, with panels rebated in and beaded from the back. In this case a ¼ in. ovolo mould worked round the panel opening has a neat effect. Stiles can be 1½ in. wide and rails 5 in. wide by ⅞ in. thick. Ball feet of the bun pattern can be fitted, cut and shaped from blocks 3 in. by 3 in. by 1 ¾ in., and screwed on.

The interior fittings consist of three shelves supported on 1½ in. by ¾ in. fillets, screwed and glued to the angle sides, or toothed into the uprights. The front edges of the shelves may be made to heighten the effect of the cupboard when opened by shaping them to either of the alternative lines indicated at Fig. 6. A section of upright (G) entering top is seen at Fig. 7, and a section for built-up top with door closed at Fig. 8. Fig. 10 is an alternative mould for the front of the cupboard. *See* Cupboard; Lacquer.

CORNER DRESSER. *(For diagrams see page 537)*

The corner dresser shown in Fig. 1 is made in oak, and embodies in its detail many Jacobean features Nearly all the joints of the under part are of the mortise and tenon type, the only awkward part being the juncture of the sides into the front legs (Fig. 4), for since the legs are turned it will be obvious that the square portion at the top must not be cut away at a greater depth than the top member of the turning.

This difficulty can be obviated by setting the job out full size, as in Fig. 3. Fig 4 shows just how much to cut away and how the side of the leg is cut in to take the side rail. The back and the front legs are from 2 in. squares, and the two side legs 2 in. by 1 in. These should be first prepared to shape (the front legs being turned) and mortised and all rails cut out. The tenons of the side rails should be run right through the side legs and be wedged from the back. When glueing together, it is advisable to glue the front first and allow it to set; then glue the two back framings and finally the sides. It is necessary slightly to strain the rails outwards when doing this.

When dry, the drawer runners are fixed. It is impossible to allow the drawer to take up the full width of the front, as this would mean that the drawer would have little or no depth. The difficulty is surmounted by recessing the drawer sides from the ends, as in Fig. 3, and fixing the runners accordingly. These are dovetailed into the front rails and sunk into the back rails and nailed or screwed. The drawer sides are dovetailed into the back in the usual way, and a dovetail is cut right across the drawer front for the front joint. After this is made, it should be put into position and guides fixed to the lower runners at each side. The top overhangs at the back 1 in., that it may come flush with the wall (the skirting prevents the legs from reaching the wall) and is pocket screwed from underneath. The mitred mouldings on the drawer

front and those round the framework complete the under part. Note that the moulding under the top is glued to the carcass only, so that the screws hold the top.

The upper portion measures 4 ft. 6 in. in height. No back is shown in the illustration, though this may be added if desired. In that case the ends would be rebated and the shelves recessed in a line with the rebate to take the back. The ends and the corner pieces are made from 1 in. stuff and are grooved to take the shelves, the tops being rebated for the top. Next cut out the top and upon this mark out the shelves to ensure their fitting accurately with the top. These shelves are tongued and grooved together at the angle (Fig. 2), and are grooved into the corner pieces in a similar way to the ends. They also have a bevelled groove run along the top near the back, in which the plates stand.

A rail 2 in. wide is tenoned at each side at the bottom into the ends and corner pieces. When glueing together, fasten all the shelves into one end first; next into the other end, the top being put on last. The cornice moulding is glued and pinned round the top and the shaped heading fixed, as in Fig. 5. by cutting away the ends and nailing, and by screwing to the back of the moulding. The complete upper portion is not permanently fixed to the lower, but rests upon the top, secured by dowels. *See* Dresser.

CORNER SEAT. As a rule, a corner seat will look best with the woodwork finished to match the woodwork of the room. Thus, in some rooms it will be painted or enamelled in ivory or any colour used for the skirting and door, etc., in others it will be stained a dark brown colour and finished by wax polishing. An impression of the finished job is given in Fig. 1. and details of construction in other diagrams. The size may be modified to suit requirements, the dimensions given being appropriate to rooms measuring about 15 by 20 ft.

The simplest way in which the amateur can make such a corner seat is by using the ordinary commercial building deal, selecting pieces that are as dry and as free from knots as possible. For the corner posts use ordinary 2 in. by 2 in. and plane it up nicely to 1¾ in. square, cut to length (4 ft.), and shape the tops by careful paring with a paring chisel. Mark out and cut the mortises for the back rail. This can be made from 1½ in. T. and G. prepared flooring 6 in. wide. When planed up it will measure about 1 ⅛ in. thick, and be about 5 ¾ in. wide. The tongue must be planed off, and the edge rounded; the groove can be widened with a plough plane or chisel to accommodate the ⅝ in. seat back, as shown in the detail, Fig. 4.

When the two back rails have been fitted to the mortises in all the corner posts, they may be put aside and the two sides prepared from 1 ¼ in. T. and G. flooring. Five pieces of 6 in. flooring will be needed to form the end, and should be glued together, well cramped up and allowed to set. Then glue and screw on the 1¾ in. square battens (Fig. 4).

Afterwards cut the boards to the shape required and finish off the edges by rounding them with a spokeshave. Take care to have the projecting tongue on the wall side, as this has now to be fitted to the two outside corner posts by ploughing a groove along the face to take the tongue, as shown in Fig. 3. Glue the tongue and secure to the corner post by long, thin screws put in from the back.

Prepare two brackets from 1¼ in. wood, to the sizes in Figs. 2 and 5, and a similar one but 15 in. long for the angle corner. Next fit a 3 in. by 1 in. bearer, by notching into the angle corner post as in Fig. 6. Mortise the bracket into it, and cut a flat on the angle face of the post to allow the bracket to seat home upon it. Take care also to set this bearer and bracket at the same angle as the battens on the end pieces. Glue and screw the bearer and bracket in place, and fix the top rails to the corner posts, standing the whole structure on a level surface and securing the bottom with a temporary strut. Test the corners and sides to see that all is square, and then cut the pieces for the seat, mitreing them carefully at the angle-corner. Glue and screw the first boards in place, then cut and fit the remainder, cramping them tightly together, after glueing the joints, and making them secure.

The seat is best made from 1 ¼ in. T. and G. flooring, arranging the tongues to the front. If a circular corner is wanted cut and fit the pieces to make up, glue them in place and finish off by the spokeshave while in their proper place, also shave off the tongue and round the edge of the seat. The seat can be secured with 2½ in. oval brads punched well below the surface.

Drill the dowel holes and glue the brackets in place. Then cut the back pieces from ⅝ in. boards or from ¾ in. T. and G. matchboard, and prepare the top so that it fits snugly into the groove cut in the back rails. Glue and screw the 1¼ in. square fillet to the seat and glue and pin the back boards with 1 in. oval brads.

A channel must be cut across the corner posts at the outer ends where the seat back slants across. This can best be done by marking the exact position from one of the seat back boards and then sawing and chiselling away the unwanted parts. A little detail fitting is called for at the angle corner, as the two end boards will have to be cut tapering somewhat, and the edges mitred.

In order to make the corner firm they can be blocked up with wooden blocks glued in place from the back and inserted between the post and the seat back.

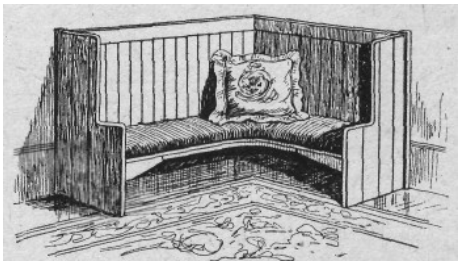
(See next page for diagrams)

CORNER WARDROBE. *(See next page for diagrams)* The corner wardrobe as shown at Fig. 1 is enclosed with curtains and is suitable for fitting in the hall, on a landing or in a bedroom.

The fitting is shown complete at Fig. 2, and a plan with a suggested dimension at Fig. 3. The boards forming the top could be ¾ in. thick, with grooved and tongued edges, cut to fit the corner. The top is nailed to the sides, which are 3 in. deep by ¾ in. thick

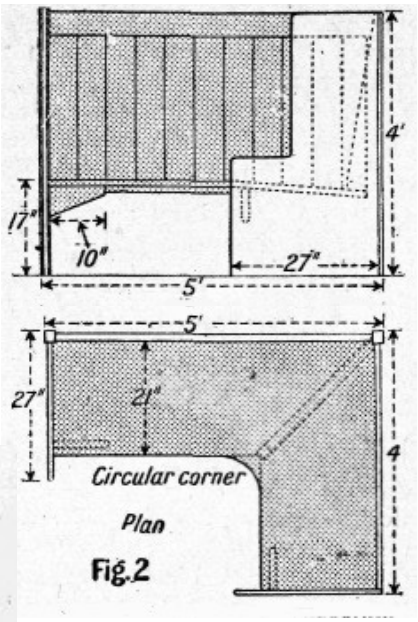
(*Continued in page 541)*

CORNER SEAT

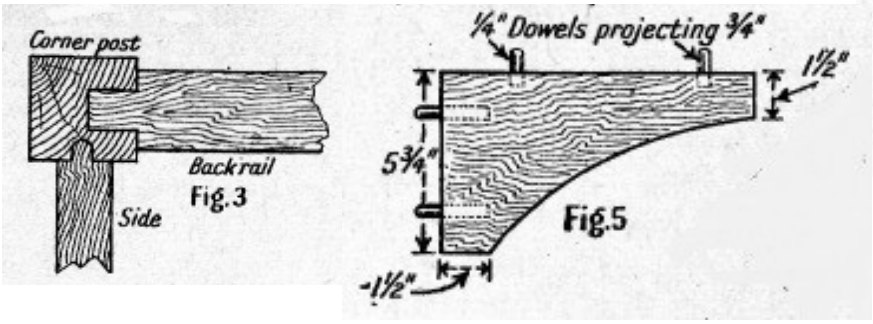


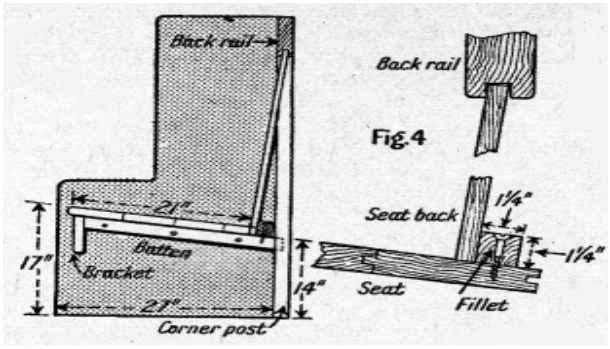
Above. Fig. 1 . Old-fashioned settee which can be made by the home woodworker.

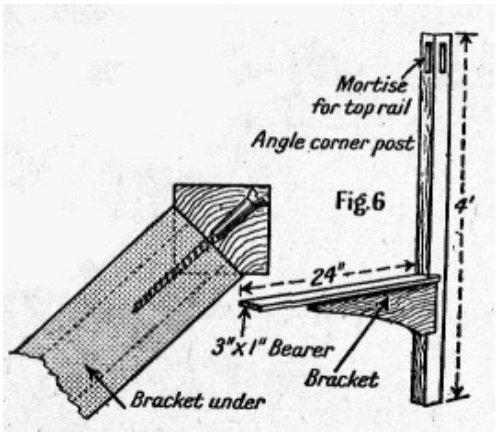
Right. Fig. 2. Elevation and plan.



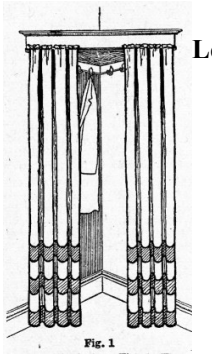
Figs. 3-6. Diagrams showing working details of the various parts.



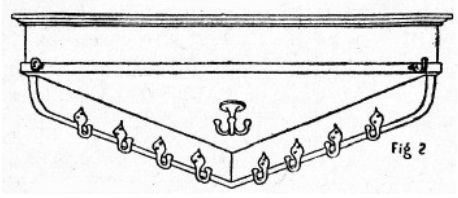




CORNER WARDROBE.



Left. Fig. 1. Useful fitment consisting of a wooden top and curtains.



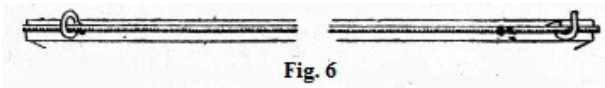
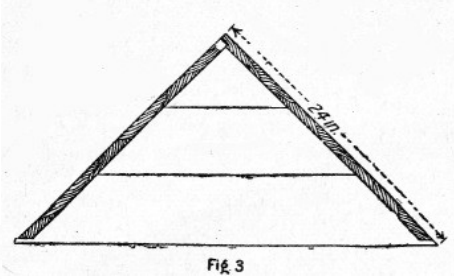
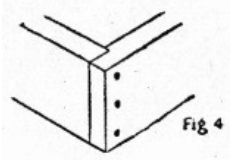
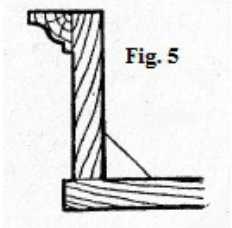


Fig. 6







Figs. 2-6. Diagrams showing how curtains are hung and method of fixing hooks.

section, rebated and nailed together at the back as at Fig. 4. The front corners of the sides are rounded, and finish about ¼ in. in from the edge of the top. The pediment is 4 in. high by ¾ in. section, glued and nailed above the top. A piece of 1 in. moulding should be fitted along the edge, and a few glue blocks fitted between the pediment and top, as indicated in Fig. 5.

Three or four coat hooks should be fitted at each side, and a swivel hook in the middle of the top, as illustrated at Fig. 2. The fitting may be fixed to the wall with hanging plates, or nails may be driven through the sides into the wall, a suitable height being about 6 ft. from the ground. A pair of curtains is generally more convenient than one, and they may be easily suspended from a wood or metal rod fitted to the edge of the top with a screw eye at one end and a hook at the other, as shown in Fig. 6. Brass rings sewn to the curtains a little from the top should be used. *See* Bedroom; Wardrobe.

CORNET: How to Play. The player holds the instrument with his left hand, fingers around the valves, while his right thumb is placed under the main tube between the first and second valves, so that he can easily press the pistons with the first, second, and third fingers. The finger action from the knuckle-joint must be firm yet agile, and care must be taken to allow the piston to return to its normal position, by raising the finger very slightly above its surface. Put the mouthpiece to the centre of the mouth, the lower lip occupying two-thirds of the cup. The sound is produced by forcing breath between the tense lips, the air in the tube being thus made to vibrate. Increased pressure results in higher pitch. Breathe through the nostrils or the sides of the mouth, but not through the instrument.

It is advisable to use a plated cornet for the reason that it looks nicer, while so far as the cup is concerned, plating may obviate any trouble arising from sore lips coming into contact with brass. Should the valves work stiffly, the remedy is to unscrew the cap, take out the piston, wash it, dry it with a soft silk handkerchief, slightly moisten it, and replace. It should never be oiled. Should grease get upon it, the best plan is to wash it in hot water, dust it with French chalk, replace it, and work it until it moves freely. It should then be washed again in order to get rid of the chalk. A little water is the best lubricant for this purpose.

CORNFLOUR. Cornflour, which is obtained from finely ground Indian corn, is used much in the same way as ordinary flour, but is better adapted for thickening sauces, gravies, and soups, as its flavour is more delicate. It is specially valuable in making blancmanges, puddings, and cakes. It should always be moistened with a little cold milk or water before being used for thickening. *See* Arrowroot; Blancmange.

CORNFLOUR CAKE. To make these take 8 oz. cornflour, 2 oz. flour, 4 oz. sugar, 3 oz. margarine, 3 eggs, and a teaspoonful of baking powder. Beat the margarine and sugar to a creamy consistency. Then add the eggs, one at a time, beating each in well. Mix the flour, cornflour, baking powder, and a pinch of salt together before stirring them lightly into the margarine, eggs, and sugar. Beat the whole lightly but well, turn it into patty tins, and bake the cakes in a moderate oven until they are done.

CORNFLOUR MOULD. A fancy mould is used for this sweet. To prepare it, mix 1 oz. cornflour to a smooth paste with a little milk, putting what remains from a pint into a saucepan containing 1 oz. butter. Heat it over the fire, then pour it on to the cornflour; return the whole to the saucepan and bring it to the boil. Let it simmer for 6 min, keeping it well stirred, add 2 dessertspoonfuls castor sugar, and draw the pan from the fire to cool the mixture slightly.

Beat up the yolks of 2 eggs and stir them quickly into the cornflour. Cook the whole slowly at the side of the fire for a few minutes, but do not let it boil. Cool it again slightly, then add the stiffly whisked whites of eggs and a few drops of vanilla. Finally, stir in ¼ oz. leaf gelatine dissolved in ½ gill of hot water, and pour the whole into a wet mould. Turn it out when set.

CORNFLOUR PUDDING. Blend 2 oz. cornflour, 1 tablespoonful custard powder, and a pinch of salt, with a little cold milk. Put what remains from a quart of milk into a saucepan with a thin strip of lemon peel and bring it to the boil. Pour this on to the cornflour mixture, stirring the whole well; return all to the saucepan, and boil it for 8 min., stirring all the time. If the mixture is too thick, add a little more milk or water. Then put in 1 oz. sugar and a few drops of any flavouring essence, and pour the whole into two soup plates previously rinsed in cold water. When the mixture is cold and set, warm a little jam, put the contents of one soup plate on to a glass dish, spread the jam over, and then put the other portion of the pudding on top. Sprinkle chopped nuts over it when dished.

CORNFLOWER (Centaurea cyanus). This favourite hardy annual bears blue, white or rose-coloured flowers. The best results are obtained by sowing seeds out of doors in early September. The final thinning of the seedlings should be done in spring; the plants left to bloom ought to be 10—12 in. apart. Seeds may also be sown out of doors in spring to provide flowers from July onwards. Centaurea montana, sometimes called the perennial cornflower, grows 2 feet high and bears summer flowers of various colours. It lives on from year to year and is increased by division in autumn or spring.



Cornflower. Flowers of Centaurea montana, popularly called the perennial cornflower.

CORNICE: Of the House. A cornice is an ornamental moulding applied to the upper parts of the walls. Modern cornices are frequently used as decoration without practical significance, and may be made in several different materials, such as stone, brick, stucco, Portland and other artificial cements. In cabinet and other work, the moulded top, as of a wardrobe, is also known as a cornice.

Cornices for the ceilings of rooms are composed of plaster and cement. They are sometimes produced by casting in moulds and screwed to wood grounds fixed in the building. Plaster cornices are, however, usually run on the work itself. The backing for the cornice is first built in brick or stone roughly hacked to the shape of the moulding, or is constructed in wood with rough brackets, lathed as if for a ceiling.

In fire-resisting construction, steel lathing is used, and is secured to bars bent to the required shape. The pricking-up or rendering coat is trowelled on as in ordinary plastering. The second coat is applied thickly, and the mouldings are formed by dragging a template cut out of zinc on wooden guides already nailed in position. The final coat in internal work is generally made of gauged stuff, composed of one part of fine stuff, lime putty, and washed sand in equal proportions, to one part of plaster of Paris. This is a quick setting mixture, and the plasterer only applies as much as he can finish at one operation.

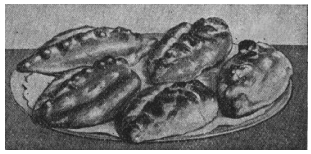
The guide rails of the template ensure a good joint at the commencement of the next length of run. Plaster of Paris is soluble in excess of water, and where used in external work must be protected by several good coats of oil paint. Where backings of cornices are built of brick, the greatest care must be taken to ensure that their connexion with the wall is thoroughly sound in every way.

Where two walls meet at either an external or internal angle the cornice on these walls meets in a mitre line. A mitre mould is sometimes employed, but the angles are, as a rule, made by hand, and are mainly worked with the joint rule, the smaller members and those at the top and bottom being first worked, and the larger members ruled in afterwards. *See* Adam Style; Cappings; Ceiling; Moulding; Picture; Plastering.

CORNISH HEATH. This is a beautiful species of English heather, found wild in Cornwall. Its botanical name is Erica vagans. The small pinkish mauve flowers come out in August and September. The plant forms very neat close clumps, from 6-12 in. highland is extremely useful for edgings to flower gardens. *See* Heather.

CORNISH PASTY. A plain short-pastry is needed, and the meat is best when uncooked; but cold cooked meats can also be used up in this way. To two small potatoes and half an onion 8 oz. meat are allowed, all cut small, mixed together with seasoning, a sprinkling of mixed herbs, and a tablespoonful of gravy. When the paste is made, it should be rolled out and cut into rounds. A portion of meat and vegetables is laid in the centre of one half of the round of pastry, and the other half is folded over, the edges being moistened and pressed together. The top of the scallop must be pricked twice with a fork to let the steam escape. The pasties are then baked in a moderate oven for about half hour.

A sweet Cornish pasty can be made by placing a large spoonful of jam on the pastry instead of meat. Slit the top covering once or twice with the blade of a knife. In this way the jam escapes when it boils up in the baking, without spoiling the appearance of the pasty. In Cornwall the custom is to pour the cream through the slits in the pasty cover as soon as the pasties are cold.



Cornish Pasty. Dish of light pastry turnovers which can be made with meat or jam.

CORNISH SPLITS. Sieve ½ lb. flour, and rub well into it 1½ oz. lard. Then add a teaspoonful cream of tartar, a level dessertspoonful sugar, a pinch of salt, and mix well together. Dissolve half a teaspoonful bicarbonate of soda in ¼ pt. milk, or sour milk if it is available. Pour this over the other ingredients and mix quickly to a dough. Turn it on to a floured board and roll it very lightly and quickly to a thickness of about 1 in. Cut it into rounds with a pastry cutter about the size of the top of a tumbler, put them on a floured baking sheet, and bake in a moderate oven until browned. When these little scones are cold, split them in halves. Spread each half thickly with jam, and put on the top of each a large dab of clotted cream.

CORONILLA. These herbaceous perennials and shrubs, which bear pea-shaped flowers in summer, need well drained soil and a place in the sunshine. The chief favourite is Coronilla glauca, which has yellow flowers; it is commonly grown as a pot plant in the greenhouse but is hardy in mild districts. Cappadocica, which is of trailing growth and bears yellow blooms in late summer, is grown in the rock garden. Emerus is a leaf-losing shrub, 4 feet high, with yellow flowers in spring; varia has pinkish blooms in summer and grows 2 feet high. The shrubby coronillas are increased by cuttings placed in sandy soil in a frame in August, the others by seeds sown under glass in spring.



Coronilla. The pink-flowered Coronilla varia.

Corpulence. *See* Obesity.

Corridor. *See* Hall; Landing.

CORROSIVE. A poison which destroys tissues with which it comes into contact is a corrosive. Included in this class are the following: Strong mineral acids, such as sulphuric acid (oil of

vitriol), nitric acid (aqua fortis), hydrochloric acid (spirit of salt); strong alkalies, such as caustic soda; carbolic acid and creosote; strong solutions of oxalic, citric and tartaric acids; chlorides of zinc, tin, antimony, and mercury (corrosive sublimate).

When swallowed the substance will have a strong acid, alkaline, metallic, or sweetish, pungent taste, according to its nature, the last being suggestive of carbolic acid and creosote. There is also an intense burning pain in the mouth, gullet and stomach, and shortly over the whole abdomen. The patient vomits, and there is also purging. Difficulty of breathing may occur from damage to the larynx. The patient may quickly show signs of collapse. There will be signs of burning on the lips and adjoining skin, and in the mouth in the shape of white, yellow, or black patches, and signs may also be found on the clothing.

Treatment consists in giving an appropriate antidote moderately diluted with water, warm fomentations to the abdomen for the pain and to the throat for the difficulty in breathing, and warmth for the collapse. A doctor should be summoned. *See* Antidote; Poisoning.

CORROSIVE SUBLIMATE. This is another name for bichloride of mercury. It is used, dissolved in water, to form antiseptic lotions: 1 in 1,000 to sterilise the hands before operating or dressing a wound, 1 in 4,000-8,000 for washing out wounds, 1 in 10,000 for an eye or ear lotion. Coloured tablets are sold which tint the water and prevent its being mistaken for and drunk as plain water; and they also make it easy to prepare lotions of any desired strength. Metal instruments should not be put into these lotions, otherwise they are blackened and destroyed. Solutions 1 in 10,000 to 1 in 1,000 may be used for disinfecting linen.

The drug is very poisonous, and if taken has a strong metallic taste, and produces a burning sensation in the throat and gullet, severe vomiting and purging, perhaps difficulty of breathing, and pain, though this may be absent. The lips and tongue are white and shrivelled. In the end there may be coma or convulsions. Pending the arrival of a doctor, whites of eggs and milk may be given. The patient should be kept warm in bed, in which are placed hot-water bottles, and if breathing is difficult hot fomentations should be applied to the throat.

CORRUGATED IRON. This useful material is made from sheets of iron, by a machine which bends it into a series of parallel ridges or corrugations, thus greatly increasing the effective strength of the material. As generally used for domestic work, the iron is galvanised to render it rust-proof; but there are many qualities on the market. When comparing prices be certain of the gauge or thickness of the sheets; a few pence more expended at the outset will often save pounds in the long run.

A medium gauge is known as No. 24, a light or thin sheet as No. 26, and a heavy as No. 22 gauge. The sheets measure 2 ft. 3 in. wide, and are generally stocked from 4 ft. to 8 ft. in length; 9 ft. and 10 ft. lengths are obtainable to order, although for long spans of over 8 ft. it is generally preferable to use two shorter sheets and to overlap them at the joint.

The approximate weight of a No. 26 gauge sheet is 2 lb. per foot run, a 6 ft. length thus weighing 12 lb. The 24 gauge sheets go a little under 3 lb. per foot run, a 6 ft. sheet weighing 17 lb., an 8 ft. sheet 23 lb. In conjunction with corrugated iron, it is well to use a few sundries made for the purpose. These comprise galvanised ridge capping, to finish a span roof at the top or ridge; galvanised nails and washers for fastening the iron sheets to the rafters; and, when required, galvanised shuting to collect the rain water, together with the needful stop ends, angles, brackets, and outlet pieces for use with the shuting.

Corrugated iron is admirable for outbuildings, stables, and other erections. The objections to its use for dwelling-houses include lack of durability as compared with tiles or slates, the noise it makes in a heavy rain, and a peculiarity known as sweating. It is also cold in winter and hot in summer, unless special precautions be taken when designing and building the roof. Against these objections are the advantages of cheapness, lightness, and ease of erection. Durability can be gained by repeated and regular coating with preservative paints. When the iron is laid over a boarded and felted roof, with an air gap, the objections of noise and sweating are largely eliminated. This material is satisfactory, when properly applied, as a roof covering for bungalows, etc.

When laying corrugated iron always reckon that a sheet only covers a width of 2 ft., as the odd 3 in. has to be lapped over the top and edge of the next sheet. Always endeavour to use the iron in its stock length, as it is difficult to cut. The best way to do this is to cut it lengthways with stout tinman's shears or snips. To cut across the corrugations, use the proper kind of chisel, and cut the iron by laying it flat on a solid support, with a hollowed block of lead immediately beneath the chisel. An alternative method is to saw it across with an old hand saw, exactly as if cutting a piece of wood, using plenty of oil as lubricant.

When covering a roof, if the length of the sheet is sufficient to reach from ridge to eaves in one piece, work from the ridge downwards. If two or more sheets are needed, begin by planning out the best arrangement by placing one sheet at the eaves, with its proper projection, temporarily fix another sheet from the ridge, and fill in the gaps by overlapping equally on each sheet above and below. Then fix the sheet next above the eaves course, follow this with the next above, and so on, finishing at the ridge.

It is generally more convenient to lay the sheets from eaves to ridge and then the next set from ridge to eaves. When three such sets have been laid, fix those on the other side of the roof, if a span roof, then fix the ridge capping. Then do the next sets, and so on to the other end of the root. By these means it is easier to get at the sheets than by laying the whole eaves course first. Use a line stretched taut to keep the courses level,

especially at the eaves, unless the root has been boarded, when the line is not needed. The proper way of fixing corrugated iron is to drive the nails or screws through the ridge and not in the trough of the material, the object being to keep the nail as far as possible out of the water, which naturally runs down in the troughs or hollows. The scantlings needed to carry the iron, as well as questions of the arrangement of the roof, if it is to be boarded or felted, must be decided according to the nature of the building and the purpose for which it is required. See Galvanised Iron; Roof.

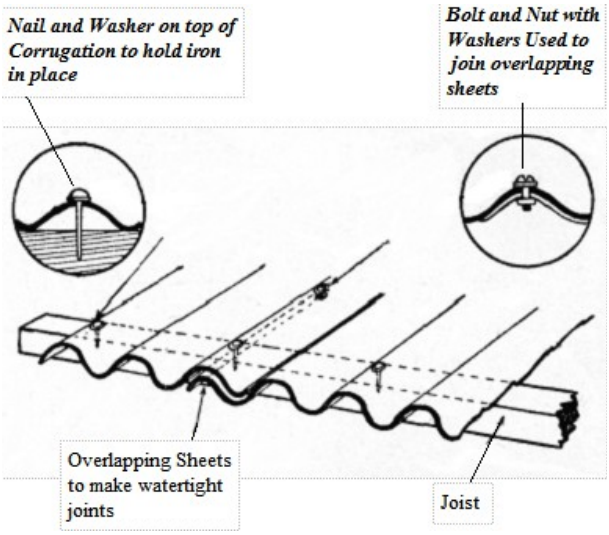


Fig. 1

Corrugated Iron. Fig. 1.Diagram showing how sheets are fastened to joists and bolted together.

Fig. 2. The end of a building with roofing in progress.

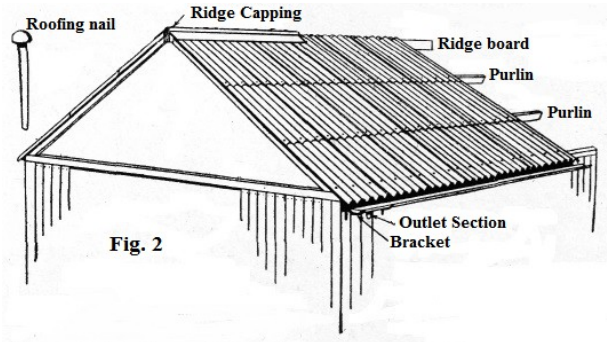


Fig. 2

CORUNDUM: An Abrasive. This is a natural aluminium oxide. The finely coloured transparent varieties include such stones as rubies and sapphires, while the impure and coarse forms are known as emery. Corundum is used as an abrasive; it is extremely hard, and fractures in such a way as to ensure sharp, cutting points, hence its value and extensive use. It is chiefly found in the home in the form of emery powder or knife powder.

India oil stones are made of pure corundum in three grades—fine, medium, and coarse. They are excellent for sharpening tools and the grades are often found in combination on the same stone. *See* Emery Powder; Grindstone.

CORYDALIS (Fumitory). These hardy perennial plants, 10-12 inches high, with graceful, somewhat fern-like leaves are suitable for the rock or wall garden. Most of them will flourish in the shade. They like well drained light soil. The commonest is lutea, which has a long flowering season and will thrive in any odd corner. Cheilanthifolia, nobilis, thalictrifolia and Wilsoni are other attractive sorts: all bear yellow flowers in summer. A distinct group of corydalis has tuberous roots: two of the best are Scouleri, with rose purple blooms in May, and tuberosa with purplish flowers in March and April: these may be propagated by detaching small tubers in autumn or by seeds sown in spring in a frame. The fibrous rooted kinds mentioned above are increased by dividing the old plants in autumn or by sowing seeds in spring.



Corydalis. Fern-like leaves and yellow flowers of this hardy perennial plant. See below.

CORYLOPSIS. These Chinese and Japanese spring-flowering shrubs are nearly related to the witch hazels. They need peaty or leafy soil. One of the best is Corylopsis pauciflora, which bears fragrant yellow flowers in spring. These shrubs are not very hardy and the young shoots and flowers are liable to be damaged by frost unless in a sheltered spot.

COSMETIC. A cosmetic is a preparation used for beautifying the skin and the hair. Among them are face creams, hair oils and similar compounds. *See* Beauty Culture; Beeswax; Face; Hand; Skin; Soap.

COSMOS (Cosmea). This beautiful half-hardy annual is raised from seeds sown in a heated glasshouse in February-March. The seedlings are planted out of doors in May. The plants grow 4 feet or so high and bear single or double long-stemmed flowers in rose, white and crimson. The early-flowering strain ought to be sown or the plants may not be in full bloom until autumn.

COTS AND HOW THEY ARE MADE

Considerations Affecting the Health and Comfort of the Child

The reader may consult the articles Baby; Child; while Nursery; Perambulator; Ventilation are other related subjects. See also Bedstead; Coverlet.

The average cot for a child measures 4 ft. by 2 ft. 6 in., but if space is no object, it is a great advantage to select one measuring 4 ft. 6 in. by 3 ft. The child can sleep in it comfortably up to the age of 5 or 6 years. The cot made of hardwood is to be recommended

rather than the iron cot. If the child falls against wooden bars, the injury is slight compared to a similar fall against iron; also wooden cots can always be obtained in a folding pattern, and can be conveniently carried from room to room, and if they have to be travelled, the charge for freight is comparatively light.

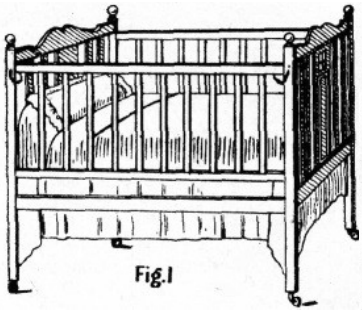
The bars should be perpendicular, and too close together to allow the child to push its head through. The height of the sides should be sufficiently great to prevent the energetic two-year-old practising his fondness for climbing. It should be possible to let down at least one side of the cot to within 2 in. of the mattress level.

A good hair mattress is strongly advised. It is twice the price of a wool one the same size, but it never goes into lumps and hollows, and is far more sanitary, and can always be re-made and cleaned. Hair pillows are also procurable, and have the advantage of being less heating for the head; but they are not necessities, and a well-stuffed feather pillow in a strong case of white drill can be safely used. Sheets should be avoided in a young child's cot. A mackintosh, an old blanket, or a thick cotton blanket are best for it to lie upon. One or two light but warm upper blankets and an eiderdown complete the bedding and can be adapted to temperature.

Many of the better-made cots are raised upon legs from the floor, so that there is no back-breaking work for the mother or nurse when baby has to be lifted in and out of his bed. These cots are also procurable in a folding form, so that they have a double advantage, especially for families who are accustomed to travel. In the case of a child who sleeps out of doors throughout the summer, the cot can be mounted on rubber-tired wheel castors and fitted with an all-enveloping curtain, arranged by means of a canopy pole and support. Mosquito nets on supports can also be fitted as extra attachments.

Fig. 1 shows an easily-made child's cot. As indicated the cot is made up of frames, three of which are fixed and one made to lower, and thus give convenient access to the bedding. A set of castors can be fitted to facilitate change of position: but, as the whole thing is light, it can easily be lifted from place to place. The size for a small, ordinary size cot is 4 ft. by 2 ft., and the height 3 ft. 6 in. For an older child the next size would be 4 ft. 6 in. by 2 ft. 3 in., after which it would probably prove more economical to construct a form of cot bedstead. Beech, birch, satin walnut, American whitewood, yellow pine, spruce, and red deal are all suitable woods that can be pressed into service. Finish can then be by staining, or in white enamel.

A commencement may be made with the two ends. The posts are of material 1½ in. by 1½ in. square, planed and cleaned up to 1 ⅜ by 1⅜ , and should be mortised for the rails as they occur. The tops of the posts can in the simplest manner be finished by rounding over as at Fig. 3, or, if a lathe is at hand, the upper 2 in. can be turned to a ball finish as at Figs. 1 and 2. Some working turners keep in stock a supply of such turned finials, and a set—with dowels— can be purchased for a small sum. An alternative method of finish, which is also serviceable for the fixing of a cot-net, is that at Fig: 4, whilst a neat finish is afforded by the fitting of 2¾ in. by 2¾ in, by ¾ in. caps with the upper edges nicely rounded as at Fig. 6. These are best fixed by a short tenon on posts, although they can be dowelled and panel-pinned to prevent twisting out of the square if preferred.



Cot. Fig. 1. Child's wooden cot.

Figs. 2 and 3. Alternative ends.

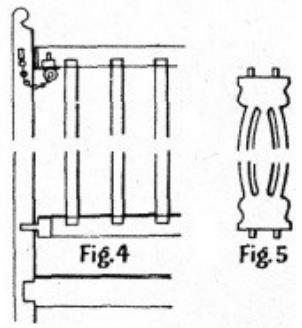
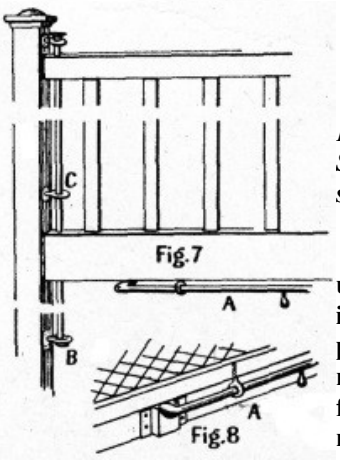


Fig. 4. Loose side. Fig. 5. Fretted panel. Fig. 6. Post with cap.





Figs. 7 and 8. Suggestions for lowering side.

The mortises for the upper rail should start 3 in. from the upper end of post, and the lower end rail can be 1 ft. 4 in. up from bottom. The cot may be framed together on all four sides at the seat, but being intended to have one side pivoted to let down, it is mortised on one side only to the posts above the seat rail. The position for pivot holes in posts is about 1 ft. 6 in. above ground.

Panels and Bars. The top end rails, which are shaped as at Fig. 2, can be finished from pieces 2 ft. by 3 ¼ in. by 1 in. They can be tenoned or dowelled to posts, and should also be shallow-mortised on under edges to receive the bars and centre panels. The panels (Fig. 2) are 3½ in. wide, with a small fret-cut opening in the upper part by way of relief. A scratch bead may also be cut ½ in. from length edges with neat effect. The bars can finish ⅞ in. by ⅝ in. thick, and,

including joints, are 2 ft. 1 in. long. It is possible to use ¾ in. dowel sticks for the bars instead of the square section, provided they are nicely cleaned up. The lower end rails finish 2½ in. wide, and are dowelled or tenoned to posts and mortised for housing the bars and panels.

The top side rails finish 1½ in. by 1 in. net thick (two lengths of 4 ft., allowing a trifle for fitting and joints, are required), and each rail is mortised on under edge to receive 10 bars. Instead of the mortises, a groove may be ploughed the length of the rail, and slips of equal length be packed between each bar in the groove. The ends of the top rail intended to lower should be banded or ferruled with sheet brass a full 1 in. wide as a provision against splitting. As this rail, when up, is kept in position by a brass screw-eye and chain attachment, no tenons are required. The attachment consists of a nut sunk in the rail and kept there by a brass plate screwed on, the eye being tapped to fit the nut, and a length of brass chain fastened thereto to hook on to a clip.

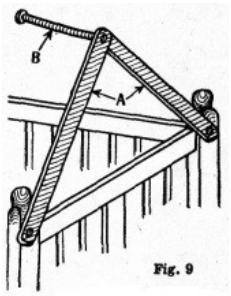
The lower rails are also 1½ in. by 1 in. net, and are mortised for bars in the same way, and, on the fixed side, have tenons cut to enter posts. The loose end, as indicated at Fig. 4, is banded and pivoted into posts, a brass screw with the head filed off answering well for the purpose. The bars can be entered into the rails to their full thickness; or, again, hardwood dowels can be employed closer together. These latter may be spaced with fretcut panels between, a suggestion for the latter being given at Fig. 5.

The seat rails can finish 2½ in. wide by 1 in. or ⅞ in. thick if tenoned to posts and pinned; or, as is sometimes done, dowelled and stiffened with brass or iron angle brackets to be screwed to angles formed by under side of rails and posts. Wire spring mattresses on iron frames are made specially for cots, and if one of these is used the whole structure will be rigid and comfortable for the child.

Sliding Side to Cot. As an alternative the side may be fitted to slide up and down a steel or nickelled rod, or a length of hardwood dowel could be substituted at a pinch. Figs. 7 and 8 will make the arrangement clear. The rod (B) can either be brazed or riveted into the cup, or may simply rest in it. The rod is capped at top and held by eyes (C) attached to posts as indicated, both rails of side being bored for the rod to pass easily through. When up, the sides can be kept secure by the device indicated at A. It consists of a rod with a clubbed end, and a bolt handle in centre normally pointing towards the ground, the whole being attached to under edge of lower (seat) rail of cot side by means of eyes. The clubbed end rests upon a metal box, as at Fig. 8, and this bearing keeps the cot side up in position. To lower the cot side the handle is grasped and raised outwardly, which disengages the club from the box and allows the side to slide down the rod, stopping upon the screw-eye.

In another type of fitting two catches screwed to the posts are made to engage with the lower rail of the cot side. A set of nickelled fittings for this may be purchased for a few shillings from a furnishing ironmonger.

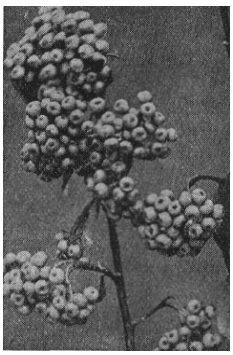
A support for a mosquito netting or a canopy is often added to a child's cot. It may be made from two pieces of 1 ¼ in. by ¼ in. hardwood (A) fastened by screws to the end of the cot, and secured at the apex by the screwed end of the short horizontal rod (B) which supports the canopy. The construction is explained by Fig. 9 below.



Cot. Fig. 9. Support for canopy or mosquito netting.

Cotillon. *See* **Dance.**

COTONEASTER. Also called rockspray, this is a hardy leaf-losing and evergreen shrub valued for its bright red fruits in autumn and early winter. They thrive in ordinary soil and are increased by cuttings set in a frame in August or by seeds sown out of doors in spring. One of the most striking is cotoneaster horizontalis which is an ideal shrub for a sunny wall; its branches spread in fish-bone fashion and become laden with red fruits in autumn. Microphylla is a trailing shrub suitable for the rock garden or border edging; against a wall it grows tall. Simonsii, rugosa Henryi, rotundifolia and frigida form large bushes and all bear showy fruits. Of those named, microphylla and rugosa Henryi are evergreens. Pron. Co-tō'-ne-ăs'-ter.



Cotoneaster. The bright red fruits of Cotoneaster frigida.

COTTAGES: ALTERING AND FURNISHING
Advice on the Improvement of a Small Country Property

Other useful information will be found in the articles Architecture and House. See also the entries on Casement; Damp; Floor; Plumbing; Sanitation; and those on Chair; Curtain; Dresser and other furnishings

When buying a cottage with a piece of land attached, inquiry should be made into such matters as sanitation, water supply, and rights of way. An otherwise desirable plot may be rendered unsuitable by the existence of a footpath or right of way across it, while the proximity of a cowshed, with its manure heap, is likely to be an obstacle to many.

If there is a well on the property the water should be analysed to be sure it is fit to drink, or if it can be made so by not too expensive filtration methods. Sanitary

arrangements in most cases will probably be of a rather primitive character, which will have to be altered or replaced by the new owner either at the instance of the local authorities or for hygienic reasons. A good earth closet should not be condemned as, under approved conditions, it may be more efficient than a water-borne system. Where water supply is inadequate chemical closets are also worth considering. They are approved by the medical authorities and very efficient if carefully used.

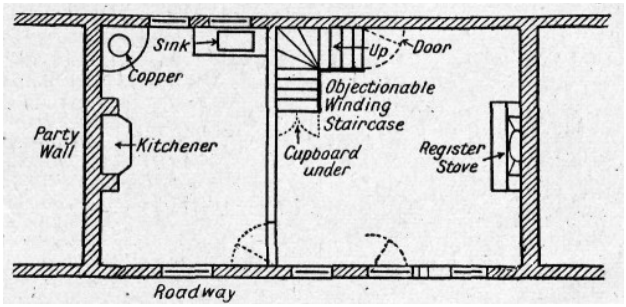
The possibilities of renovation must be kept in mind, as very often a dwelling with communicating rooms can be converted with little expense into a convenient home, especially when the owner is able to undertake much of the work with his own hands. Economical methods are essential, but the very nature of the building demands plain work, with simple furnishings. The essentials of satisfactory restoration or the addition of new work calls for an adherence to the local traditions of building.

Altering an Old Cottage. The first thing is to decide upon the scope of the alterations, the location of additional windows or the enlargement of those existing. The whole of the exterior should then be gone over, replacing any missing tiles, repairing a stone roof, or renewing the thatch, as the case may be. Get up into the roof, inspect the rafters, and if any of them show distinct signs of failure these should be relieved by fixing a flitch plate or an extra rafter, laid alongside.

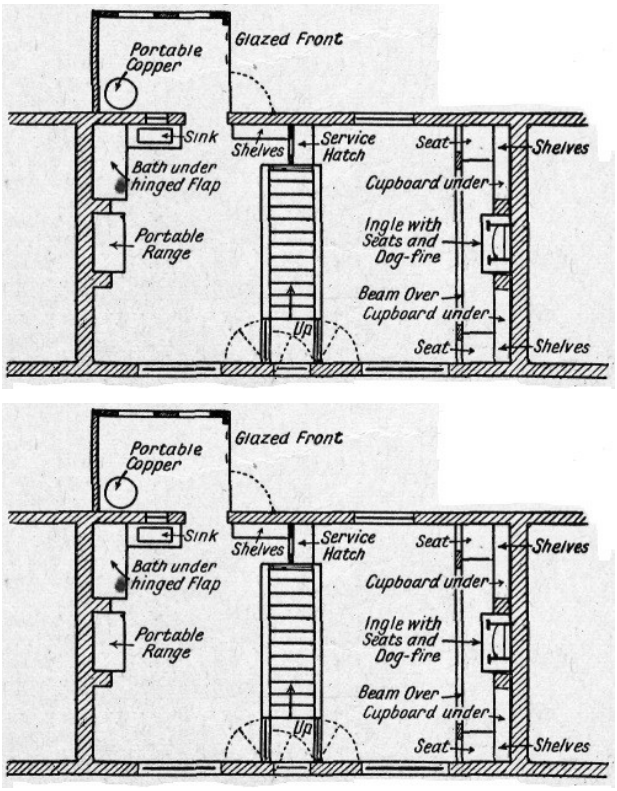
Then give attention to the walls. Brick work may need re-pointing, but do this carefully. A struck joint will probably look best, and it is not necessary to remove all vestiges of moss and lichen, as they add to the charm of the exterior. Oak timbering should be treated with boiled linseed oil well brushed into the surface; two or three applications may be needed to restore the dark colour associated with old work. Any damaged parts can be cut away and new wood fitted, taking care to model the surface to conform with the contours and characteristics of the old work. Never cut through old timbering unless fully satisfied that no damage will be done to the structure. Shoring may be needed to relieve the timber of all strains during renovation.

Old plaster panelling may look in bad condition, but if the lathing is sound renovation may consist in brushing off all loose material from the face, making good with lime or cement mortar, and applying a liberal coating of waterproofing paint or a good cement wash. Footings, foundations, and damp-proof courses will probably be very rudimentary, but if the building is dry it is best to leave it alone and be content with filling in any gaps with cement mortar. New or larger windows often improve the interior in a surprising way, and there is nothing more convenient for this than a metal-framed casement which can be built direct into the wall.

The staircase may call for renewal and some new arrangement, as many old cottages have dangerous winders if the stairway is at all cramped. The plans given will suggest typical treatment, but care must be taken to provide sufficient head-room, a clear height of 6 ft. being the absolute minimum. Attention should be paid to tie beams or other structural features that cannot be altered, and may be in the way of a contemplated position for the new staircase.



Cottage. Plans showing how a terrace cottage can be improved at a minimum of expense. The above plan shows the ground floor before conversion.



Above plan, after the improvements have been made.

Communicating bedrooms may have advantages when the second is used for young children, but this feature, frequently met with in old cottages, is generally objectionable. Much can be done by changing the position of the staircase, or by the provision of a partition wall, thus forming a passage-way between the rooms. Fireplaces or their absence offer another problem; a practical solution may be the use of a slow combustion or anthracite stove, which can have a stovepipe fitted into an existing chimney-stack, or to an outside flue-pipe placed in some inconspicuous position. In any case, care must be taken to keep clear of existing timber which might be set alight by the heat from the flue-pipe. Any room not provided with a fireplace should have a ventilating air brick or other

device arranged in the upper part of one wall, or a small grating over the door.

Old doors will often be found deficient at the bottom or ill-fitting in the framework. Effective remedies are to cut away the badly damaged parts, work a feather on the end, and fit a new piece. New door stoppings make a marked difference to the comfort of a room if they are fitted closely to an old door that has warped and does, not shut tightly. Worn thresholds are easily restored by cutting away the worn parts and making a new oak tread, which can be secured with well countersunk brass screws. Floors may need patching or renewal. A worn brick or the floor can be greatly improved by taking up the old bricks or tiles, re-levelling the soil, and re-setting the bricks or tiles in cement mortar, but with the worn sides downwards; the original under-sides of the tiles will probably be found to be in perfect condition.

The Water Supply. The provision of a bathroom, larder, and improved facilities for water supply depend almost entirely upon individual requirements, but one point must be mentioned in connexion with the erection of a water-tank or cistern in the roof. This must be very carefully considered and before commencing work it is necessary to make sure that the pipe lines can be laid correctly, and that the cistern is not placed in the middle of the ceiling rafters. A small tank of 50 gallons capacity may easily weigh ¼ ton when filled, and the ceiling rafters will not support such a weight. The cistern had best be placed over a wall, or in some place where adequate support is obtainable. The great object in modernising a small dwelling should be to retain the charm of the country cottage while providing all the essential modern conveniences.

How to Furnish. The necessary repairs and renovations completed, the charm of the cottage can be added to by suitable interior decoration and furnishing. The keynote should be simplicity.

The type of cottage that one may wish to furnish may vary from an old half-timbered one with thatched roof, inglenook. etc., to a plain brick building with sash windows and Victorian fireplace. The furnishing of the former type is comparatively easy. Every possible use is made of the special features, and care taken that the furniture should go with its surroundings.

For example, the charm of a room with oak beams would be enhanced with old dark wood cottage furniture. If this is not available, inexpensive reproductions can be obtained in oak, walnut or birch colour; or wood may be left unstained and wax polished where there are no dark oak beams to set the decorative scheme.

The rooms of most cottages are small, the doors narrow, and the ceilings low-pitched, so pieces of heavy furniture that would suit a house of moderate size would look too large and take up too much of the limited space available.

Unless two cottages have been knocked into one, thus providing more accommodation, the arrangement of the rooms must be well thought out. Sometimes the living room has a dining recess, the room having been enlarged by taking in the old kitchen and converting the scullery into a more modern kitchenette. Thus a dining room and sitting room are obtained, the former sometimes combining with the hall as the front door opens directly into it and the staircase may lead out of it to the first floor. Such a plan has an informal and at the same time decorative effect if the woodwork is of oak and an old lantern is hung from a wall bracket to light the staircase angle. The sitting room may contain two or three useful pieces of furniture, a few comfortable chairs, a good table, shelves for books, window seat, and an upholstered settee or divan.

If the window curtains, valances, and chair covers are made of some figured fabric like chintz or cretonne, the wall should be rough surface plaster, distempered with some self-colour or papered with plain paper. An unpatterned wall surface gives a greater idea of space, so is eminently suited to small rooms. Even more important, the gay colours and design of furnishing fabrics show to perfection against a plain background.



Cottage. Typical English thatched cottage. (Photo, courtesy of Our Homes & Gardens)

Occasionally cottages used for short holidays and week-ends only are furnished with unwanted pieces from another house. A cottage can be made attractive under such conditions if attention is paid to colour and details. To supplement oddments, the amateur or village carpenter can make such things as ingle-nooks, window seats and other useful pieces. In small, low pitched rooms wall ornaments should be used with discretion. An antique warming pan, a few pieces of pottery, an arrangement of flowers on a shelf to break the wall line are more restful than odd pictures or crowded effects.



L-shaped living-room. The dining recess is in the smaller portion beyond the fireplace; it holds a refectory table and six chairs and has a serving hatch. The armchair is covered in a printed linen and the curtains are of gaily checked gingham.

Attention must be paid to floor coverings. Even a brick floor that could not be classed as damp allows a certain amount of moisture to percolate through it. For this reason avoid the use of tight-fitting linoleum or other covering which excludes access of fresh air. Uneven surfaces, such as worn brick or flagged stone floors, soon cause holes and cracks to appear in the linoleum, and any dampness on the under surface would tend to rot the cork. Coconut matting is excellent on such floors. Strips can be used for passages, and mats and small carpets in coloured fibre can be bought very cheaply. The advantage of fibre is that air can readily pass through it to the bricks, and any moisture that is absorbed by the matting helps to lengthen its life.

The living-room with dark beams lends itself to stone-coloured, or cream distempered, or painted walls. In north rooms warmer tones could be used with advantage; buff, apricot or primrose yellow are suitable. The woodwork would probably be finished to match the timbering, though lighter colours are effective for window woodwork, unless the windows are latticed. A suggestion for a sunny room is cream-coloured plastered walls, oak-coloured paint, short curtains with the valance fixed to a pelmet board. A window seat with upholstered cushions could be covered, and all other hangings made from a cretonne in which blues, yellows, greys and soft reds mingle.

A predominant note of blue harmonises well with brick tiling on the floor or a brick fireplace. Striped woven rugs or a small oriental carpet may be used. Oak or other hardwood stairs merely require to be stripped and wax polished. Those made of white wood and having painted sides can be made attractive by having plain or bordered hair stair-carpeting laid. Light coloured walls are essential if the staircase should be dark or narrow.

The furnishing of the bedrooms should be simple; cheap painted furniture is suitable, in the absence of better pieces. If space is limited, make a dressing table from a triangular shelf placed across one corner. If a bathroom has been introduced during alterations it is rarely necessary to have washstands.

A cupboard with fitted drawers at the bottom answers as a wardrobe. This should be placed against a dry inside wall. Corner fitments with curtains are useful for hanging clothes. If the floor boards are in good condition, linoleum or cork carpet can be used with rugs, or square of fibre or hair carpet. In order that the exterior of the cottage may be as charming as the inside, the curtains of all windows that can be viewed at the same time should be of, or lined with, the same colour.

Cottage Pie. This is made from cold minced meat and potatoes, and is also known as shepherd's pie (q.v.)

COTTER: A Wedge. A wedge-shaped piece of metal, known as a cotter, is adapted to draw up the joint between a shaft and a crank, or other part of a machine. A familiar application is the cotter pin in the crank of a bicycle (q.v.). Essential requirements in fitting such cotter pins are, that the pin shall fit accurately in the hole drilled in the crank, and that the flat surface on the cotter is correctly shaped to bear on the flat formed on the shaft. Both surfaces should be in contact over as large an area as possible. It is tightened up by a nut and washer.

COTTON. Not only are clothes, furnishing fabrics, and sewing materials obtained from cotton, but the seed on which the cotton fibre is found is rich in oil, and this is pressed out and used to make soap, margarine, and so on. The lint adhering to the seed after the main part of the fibre has been removed forms a base for making guncotton, collodion, and arti-ficial silk, and is frequently made into cheap cotton wadding. The residue of seed remaining after expressing the oil forms a cake which is widely used and highly valued as cattle food.

The superior cotton fibres are silky and soft, whereas some are harsh and wiry. The longer and silkier are naturally the most expensive, and from them the finest threads and most delicate cloths are made. The very best cotton spun into the finest yarn fetches a far higher price than silk.

Cotton Fabrics. Tent and sailcloths are generally cottons, and so are nainsooks and cambrics. The lawns, sheetings, and shirtings once universally made of linen are now generally cotton, which also replaces wool in flannelettes and even in blankets. It takes the place of silk in mercerised linings and embroideries, in velvets and umbrella cloths. Cotton reps, damasks, tapestries, and cretonnes cover furniture, and cotton rugs and mats are used on floors. Lisle or hard-twisted, superior cotton thread makes stockings; and cotton fabric, with a suède finish, is used to make gloves. Raincoats are often cotton, as are curtains, tape, lace, imitation leathers, bandages. Much twine and cord, containers like flour bags, and most of the webs for braces and belts are cotton. Motor tires are made upon a foundation of the very best cotton; electrical wires are insulated with cotton, and nearly all clothes are sewn together with it.

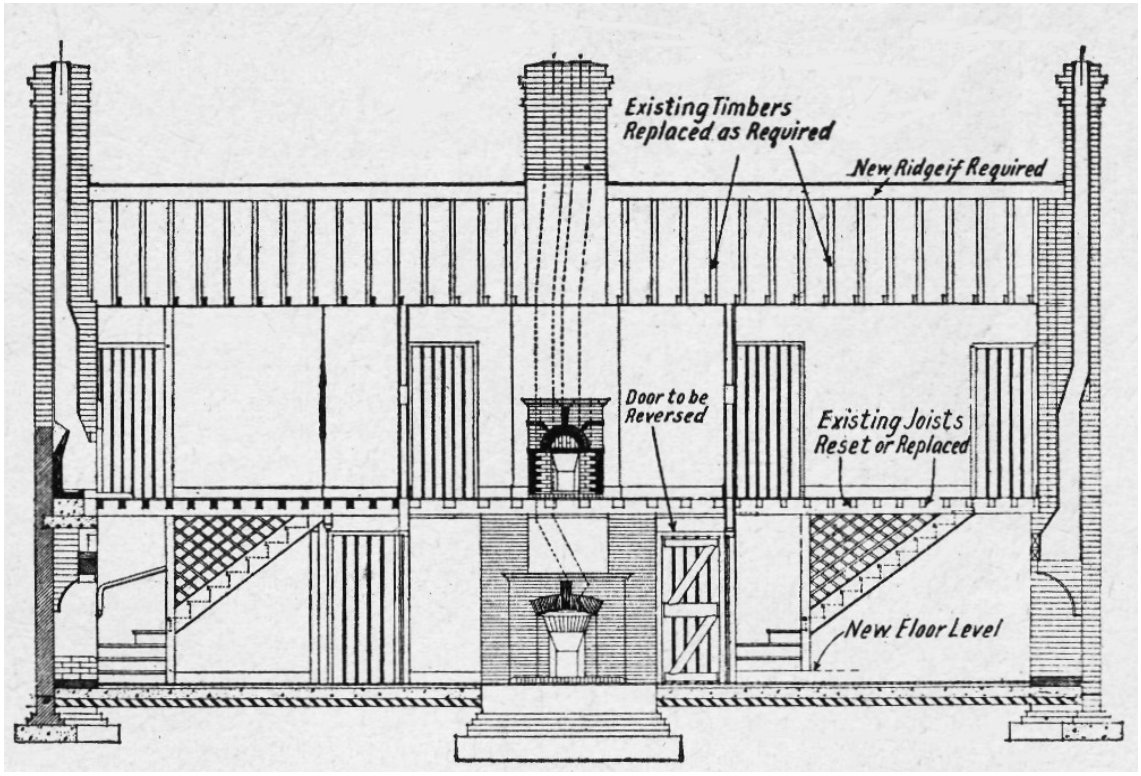
Uses and Defects. Cotton is blended with woollen materials that would otherwise be too poor for use, in order to lend strength to the whole and not necessarily for cheapness. Fairly expensive cloths used in place of flannel are rendered practically unshrinkable and better wearing for being made of a blend of fine cotton and fine wool. It is now possible to dye cotton with more fastness than any material. Cotton can be lent the appearance of silk, as seen in the mercerised cottons employed for so many purposes. By being woven in open cellular texture, or bushed like flannelette, or made with a loop surface like Turkish towelling, or with a smooth pile like velvet, it is made an efficient non-conductor of heat and thus warm to wear.

The defects of cotton vary, and in general it does not

(Continued in page 554)

COTTAGE: BUILDING AND REBUILDING

Schemes for Rural Homesteads Old and New

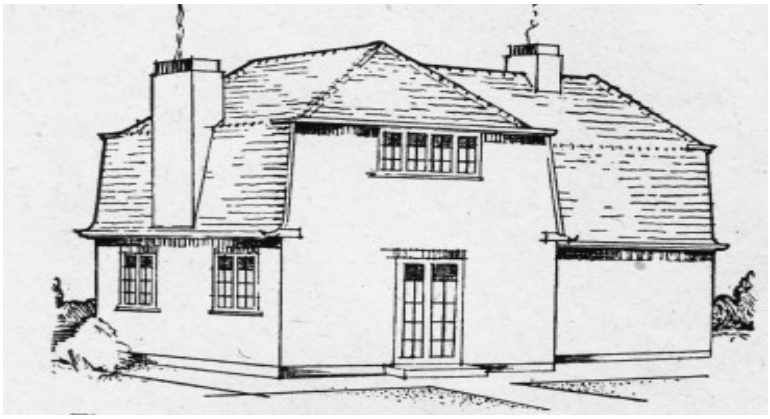


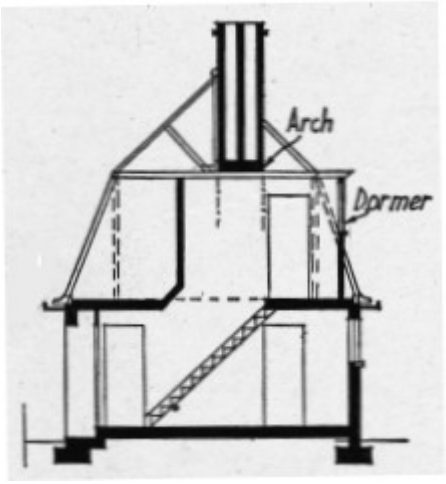
Above, section of reconstructed cottage on line B—B, shown in the plans below. Note interior improvements: oak external framing, Columbian pine floors, and a new Claygate fireplace set in the entrance-hall.

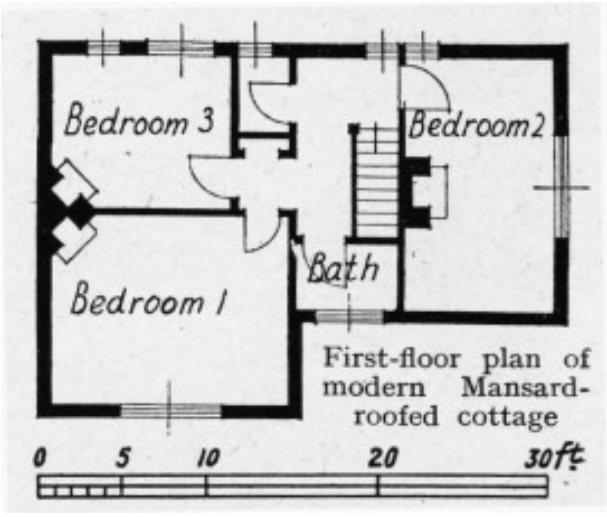


Left, the front elevation of a Tudor cottage after reconstruction. A new wing has been added on foundations where a third cottage formerly stood. The whole building was underpinned and concrete foundations laid.

The word "cottage " is applied to a wide range of domestic buildings; but it really implies a small dwelling for people of limited means. A parlour and three bedrooms is the minimum standard of accommodation, and this type, with Mansard roof, is here shown. Below, elevation of a design which avoids a stereotyped square plan by means of a projecting face. Left, same design shown in section. The living-room should not, if it can be avoided, face north.



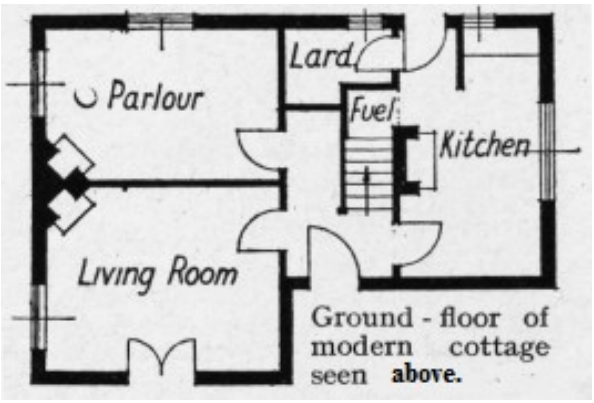




First-floor plan of modern Mansard-roofed cottage

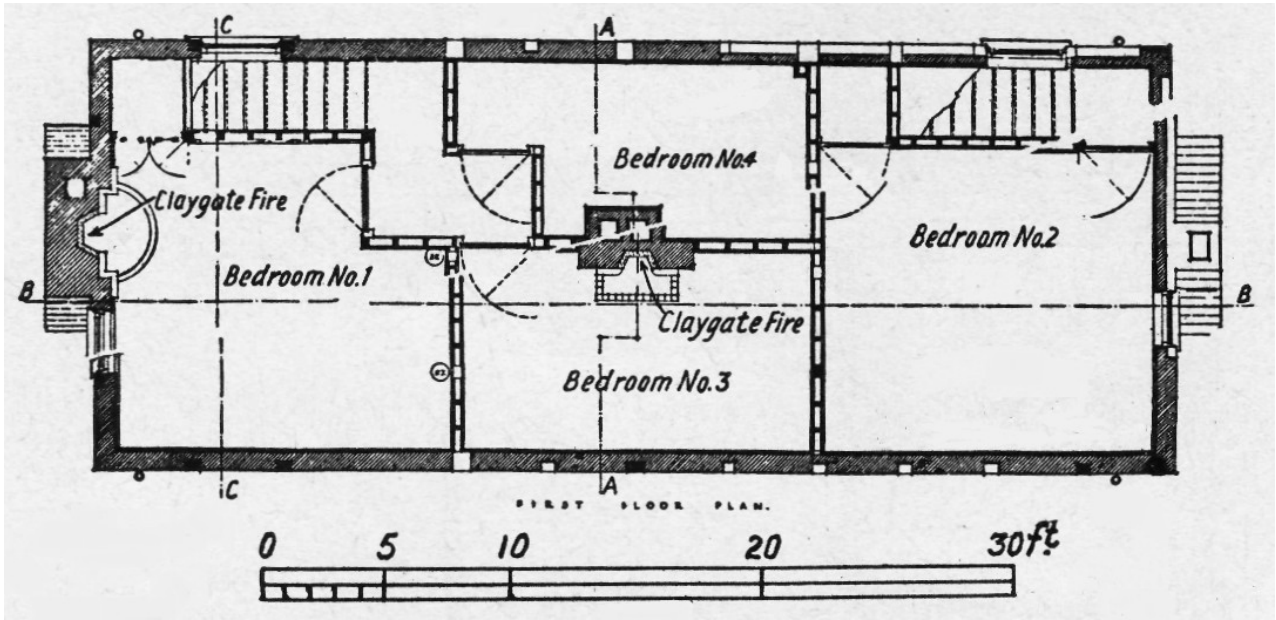


Above, photo shows the ruined skeleton used as basis of work on two tumble-down cottages. Much has to be done. The aim should be to use the old form as far as possible. The roof should be felted, boarded and counter-battened. Chimneys are usually very substantial, and should retain their characteristics. In half-timbering, trace the original timbering lines; mend with old oak members, without disturbing their weatherproof surface. Fill gaps with slate-lined brickwork; not with wattle and daub, which is generally forbidden by Local Authorities (Architect, Eric Hayman)

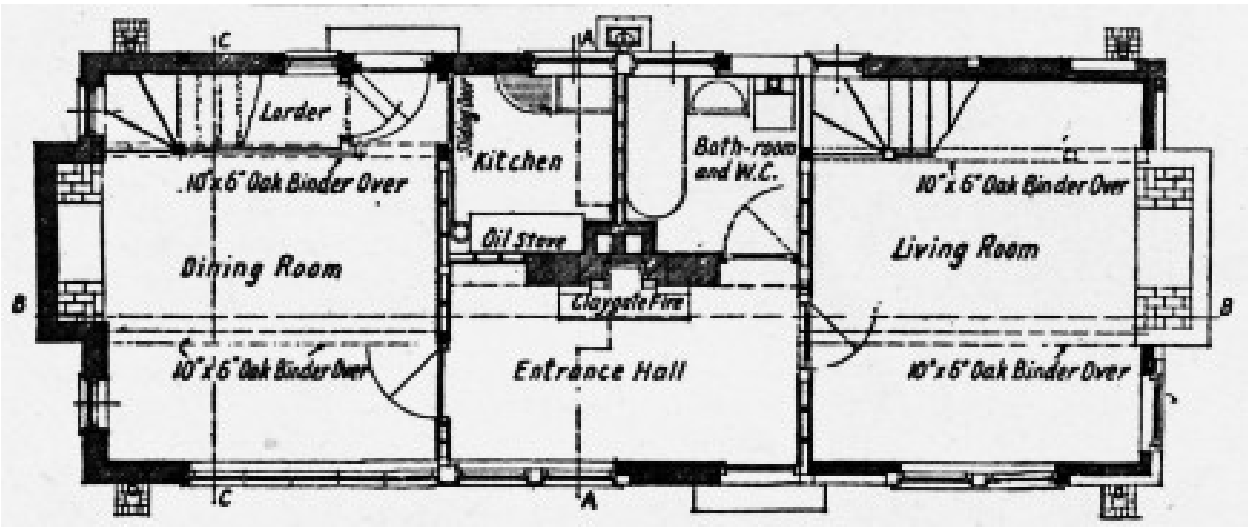


Ground - floor of modern cottage seen **above.**

Below, note how the common defects in old cottages are remedied: a new damp course; thicker walls; larger and better-positioned windows; and new roof tiles.



Above, first floor and next page ground-floor plans of the rebuilt cottage seen on the previous page.The outline of the three former cottages is retained; so the bathroom had to be placed on the ground floor. The common fault of trying to make everything look rough and "quaint" should be avoided.

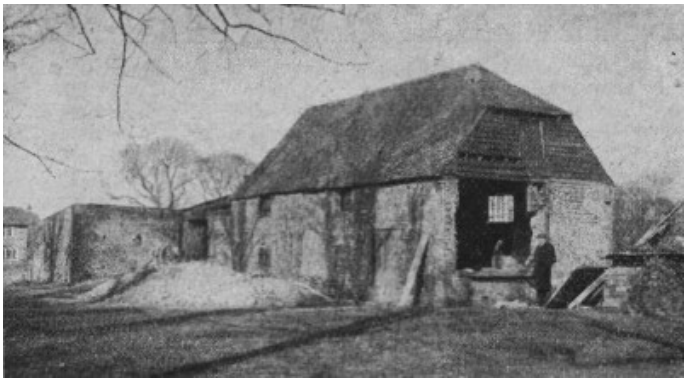


COTTAGE: A RUIN TRANSFORMED BY OUR EDITOR



Left, North view during rebuilding; unroofed portion on right later converted into walled garden with rain water cistern under.

Below, West Front from garden showing verandah and entrance.





Above, East view of the ruin before conversion; unroofed portion on left later converted into commodious garage and pump house.



Left, general view of cottage from North East after completion. Compare with view, top left.

bear washing as often as linen. Cotton damask tablecloths and napkins are more fluffy and less firm than linen. The short fibre comes away as lint, as is seen in using cotton dusters or glasscloths. Used as dress material, cotton shows creases more than wool or silk, for it lacks resiliency.

A simple and moderately effective process to reduce the inflammability of cotton is to steep the article in ½ lb. alum, ½ Ib. phosphate of ammonia, dissolved in one gallon of water. As the deposit of these salts left upon the fabric produces the flame-proofing effect, the articles must not be wrung too heavily and should be hung to dry. Cotton goods are easily scorched in ironing or in drying too close to a fire, and such heat enfeebles the fibre and shortens the life of the cloth.

Sewing Cotton. A fine quality of raw cotton is required, and a uniformity of thickness for the yarn from which sewing cotton is made. It is important for neat and strong needlework to use sewing-cotton of the proper thickness. No. 50 is a good average for general sewing, with 60 or even 70 for fine work such as babies' garments, 40 for strong calicoes and 30 for such jobs as securing buttons on which there is considerable pull.

A convenient way of storing reels of cotton, which take up too much room in the workbox, is to string them on a long loop of string, and hang them from a hook or nail. The loop can easily be taken down and laid on the work-table when sewing is in progress, and every colour and thickness will then be handy. Mercerised sewing-cotton is dipped in a solution which gives it a silky appearance. It is useful for stitching mercerized and mixed cotton and silk fabrics. *See* Laundry; Mending; Sewing Machine.

COTTON THISTLE (Onopordon). A very fine and vigorous growing biennial plant, the cotton thistle is suitable for shrubberies. The stems are covered with whitish hairs, and the heads of flowers are thistle-like in form and purple in colour. The best sorts are acanthium (known as the Scotch thistle) and bracteatum, which grow 6 feet or more high.

COTTON WOOL. Cotton wool is used for affording protection from cold and injury and for absorbing discharges. It can be obtained medicated with boric acid, salicylic acid, iodoform, etc. For dressings the absorbent variety should be used.

Cotton wool is sometimes used to plug the ears, e.g. in bathing and after syringing. Care should be taken to prevent the plug from slipping into the ear by making it sufficiently large and not pushing it in too far. When the ear is discharging, a plug may be dangerous, as it may imprison the discharge; so if this is at all free it is safer to place a pad of cotton wool over the ear hole and keep it in position by a bandage or sticking-plaster.

A piece of absorbent cotton wool is a good thing to use as a sponge in dressing wounds, etc. It is soft and comfortable, and can be burnt afterwards.

Thick pads of cotton wool may be used in conjunction with camphorated oil to cure colds on the chest. The oil should be rubbed on the chest just before the patient retires for the night, and a pad of cotton wool placed over it. The pad may be held in position by means of a bandage, but the latter must not be too tight, otherwise it will interfere with the patient's breathing. The most useful form of cotton wool for this purpose is gamgee tissue, which may be shaped to form a jacket.

COUCH. Originally meaning any article or spot used for resting or sleeping on, a couch is now usually a synonym for a sofa. *See* Chesterfield; Settee; Sofa.

COUCH GRASS. One of the worst of garden weeds, its botanical name is Agropyrum repens. It spreads alarmingly by means of its creeping rootstock and can be exterminated only by digging out the roots.

COUGH. A cough is nature's method of clearing the air passages of material which should be got rid of, whether it has been introduced from without or been formed in the lungs or air passages themselves. If anything we are swallowing goes the wrong way we at once cough and prevent its entrance into the trachea. What happens is that in response to the irritation produced by the substance on the lining of the entrance to the larynx, we take a deep breath and the vocal cords are closed. We then make to breathe out strongly, the vocal cords fly apart, and the air is expelled with force and suddenness, sweeping the offending material in front of it. The irritation has stimulated a centre in the medulla oblongata, the part of the brain which is continuous below with the spinal cord, and this sets the expiratory muscles in motion.

Frequently the centre is stimulated by irritation, occurring at various parts, when there is nothing to be brought away, and the cough serves no useful purpose. This is spoken of as a dry cough, and it may be due to irritation from adenoids, or a long uvula, to inflammatory mischief in the air passages or elsewhere in the organs of respiration, to tumours of the larynx, and other causes. It is the cough of dry-catarrh which is often so troublesome in elderly people. Irritation of the larynx produces a croupy, hoarse, or brassy cough. This occurs in laryngitis, diphtheria, aneurism of the chest, and other conditions.

A paroxysm of coughing may occur from persistent or severe irritation, but when it terminates in a crowing sound produced by a long-drawn intake of the breath it usually means whooping-cough. Winter cough is that due to a chronic bronchitis, which improves in fine weather and grows worse or only appears when the weather becomes cold and damp. A stomach cough may occur, but it is much more uncommon than is supposed, and a persistent cough should not be accepted as merely a stomach cough without consulting a doctor, as it may be due to early consumption. Cough is merely a symptom, and its treatment should be directed to its cause. *See* Bronchitis; Cold Consumption, Whooping Cough, etc.

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Consumption, Whooping Cough, etc.

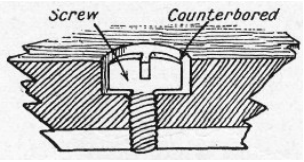
Cough Lozenge. Numerous lozenges for relieving coughs can be obtained from chemists, but for a simple and slight cough a lozenge can be made at home, if desired, from syrup of horehound The syrup can be made from the stems and leaves of the horehound plant steeped for several hours in cold water. Allow ½ oz. of horehound to a cupful of water. The syrup can also be obtained from a chemist.

Boil up the liquid with 2 lb. of demerara sugar and 2 tablespoonfuls of vinegar until the syrup sets when dropped into a cup of cold water. Add ½ a teaspoonful of carbonate of soda, and boil up again until, when a little is dropped into water, it sets and is brittle. Pour it out on to a buttered tin to set, mark it out in squares with a knife, and, when cold, snap off as marked and wrap each piece in waxed paper. Store them in an airtight tin. Ordinary treacle toffee has a soothing effect.

Cough Mixture. Cough is merely a symptom of a large number of different complaints, and in the case of any particular complaint a drug which is useful at one stage may be harmful at another. It is unwise, therefore, to take medicine for a cough without knowing what the cough is due to, and to persist with a cough mixture because it has benefited somebody else's cough. In the case of a cough which comes on each year in cold, damp weather, the winter cough, the following may prove useful: Chloride of ammonium, 2 drams; compound tincture of camphor, 4 drams; liquid extract of liquorice, 2 drams; spirit of chloroform, 2 drams; infusion of senega, to 6oz. The dose is a tablespoonful thrice daily, in a little water, after food. *See,* Bronchitis.

COUNTERBORE. This tool consists of a central peg, or pilot, and a larger diameter cutting part, rotated in a lathe or drill press. The tool is fed into the work until the desired depth has been attained. A good counterbore should be capable of turning out a neatly finished hole or recess having square corners, such as are required for the reception of a screw head that has to be sunk below the surface of the surrounding metal, as illustrated. The same result is obtained in woodwork by using an auger bit, drilling out the larger diameter hole first and following with the smaller one, otherwise there would be no material to guide the auger, unless the small hole be temporarily plugged for the purpose.





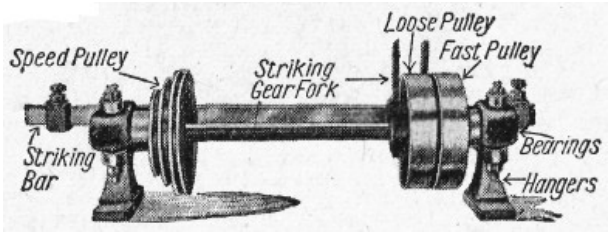
Counterbore. The tool used in metal work, and diagram showing counter-bored recess for a bolt head.

COUNTER IRRITANT. A counter-irritant is an agent which produces redness and irritation of the skin. The idea is to bring an abundance of blood to the skin vessels, with a view to relieving congestion of deeper structures or organs. Counter-irritants include rubefacients which redden, e.g. acetic acid, solution of ammonia, liniment of camphor and ammonia, liniment of capsicum, mustard, iodine; vesicants which blister, e.g. cantharides or Spanish fly; and pustulants which produce pustules (blisters containing matter), e.g. lunar caustic and croton oil.

It should be remembered that substances of the first class, if used too strong or too long, may blister, while those in the other class may be used sufficiently diluted to produce redness only. In applying counter irritation for the relief of an underlying condition, better results may be achieved if it is applied rather at a little distance than just over the seat of the pain. *See* Plaster.

Counterpoise. *See* Earth.

COUNTERSHAFT. A countershaft is used in connexion with belt-driven machinery. It is a short shaft mounted in suitable bearings and equipped with pulleys.



Countershaft for use with belt-driven machinery.

The counter-shaft is driven by a belt from the main or line shaft, and another belt transmits the drive from the countershaft to the machine. As usually arranged, a striking gear is provided to move the belt from the driving pulley on to one of equal size, situated next to it, called the loose pulley, as it is free to revolve on the countershaft itself. A typical countershaft that is suitable for an amateur's turning lathe is illustrated above. *See* Amateur Carpentry Gear; Lathe.

COUNTERSINK: A Brace Bit. The name of countersink is applied to a type of brace bit used to form a conical-shaped recess in wood or metal, etc., whereby the head of a screw or rivet can be let in flush with the surface. *See* Bit.

COUNTESS PUDDING. A good steamed pudding is made by greasing a mould with butter, and arranging 2 oz. quartered glacé cherries and the same quantity of quartered stoned raisins in the bottom of it. Now line the sides with some thin strips of plain madeira or almond cake. About ½ lb, cake should suffice. Mix any left over with 4 oz. crushed macaroons, 2 lightly beaten eggs, and ½ pint milk. Fill the mould with the mixture, tie a buttered paper over it, and steam it for about ¾ hour. Turn it out to serve.

COURSE: At Meals. For the ordinary luncheon two courses, either an egg dish, fish or meat and a sweet, are the rule, but the menu may be supplemented by a soup, or cheese course. For dinner it is usual to plan a meal of four courses, stretching to five or six for special occasions. In small households, soup or fish, entrée or joint, sweets and savoury, are generally enough, serving melon, grape fruit or hors d'oeuvre instead of soup for a change, or including fish and omitting the savoury.

When entertaining, a poultry or game course can be introduced after the entrée, or this can be varied by a vegetable, such as asparagus, salsify or seakale, served as a separate course. It is not usual now to serve an ice as well as sweets, but the former frequently takes the place of the latter at either a luncheon or dinner party. At a small dinner dessert may be omitted, especially when some kind of fruit ice or salad forms the sweet course.

For a more ceremonious dinner party the full list of courses would be—melon or hors d'oeuvre, soup, fish, entrée, joint, poultry or game, sweets or ice, savoury, dessert. The entrée should be complete with any necessary vegetable in one dish, but potatoes and one or two vegetables are served with the joint and salad with game or poultry. On rare occasions a sorbet—a punch ice—is served between joint and game, and small Russian cigarettes may be handed round with this course. For a supper hot soup may be served, but otherwise the term usually signifies a cold meal with meats, sweets and savouries either on the table or sideboard, and no formal courses. *See* Dinner; Luncheon.

COURT PLASTER. This is a mixture of isinglass, glycerin and alcohol spread on silk. It is used to bring the edges of a cut together and to protect it.

COVER: For Furniture. Loose covers of chintz, cretonne, etc., afford protection for furniture, and are also useful for bringing odd chairs into a harmonious colour scheme or for placing over worn chairs or settees. These should be cleansed thoroughly before the new covers are put on. An armchair should be rubbed with stale bread, and it this fails to remove the marks, benzoline will probably be successful. This is best applied out of doors benzoline being highly inflammable.

A plain rep fabric or one with a small pattern can be chosen for a cover because it is easily fitted, but if a distinct pattern is selected for decorative value care must be taken to see that it is correctly placed. Hang the fabric wrong side out over the chair, so that any pins used in fitting can remain until the cover is sewn. Allow at least 1 in. all round for the hem at the bottom, and, when fitting, tuck the material well in at the back of the seat. Since the covers are not to be tight fitting, a certain amount of fullness should be allowed at the back and front, and plenty of material used for tucking in at the sides, where if possible, all joins should be arranged.

If necessary pieces should be let in at the front of the arms. Having fitted the chair, cut the materials to the required shape, remove the fabric, and the cover is ready to be sewn up. In doing this leave the necessary opening at the back, make a false hem for the buttons, and an inside flap for the buttonhole. The seams and lining edges of the furniture should be piped. Use strong cotton for the sewing, and oversew each corner firmly. Turn up the hem and thread a tape through it from end to end. The tape will draw the cover neatly round the frame and can be hidden by a flounce reaching to the floor. For a chesterfield or large settee double width material about 50 in. wide is best. *See* Cretonne; Decoration.

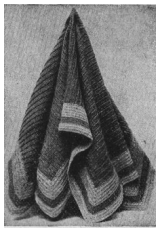
COVERLET. This is another word for bedspread or cot cover. A waterproof or a fabric cover of an ornamental nature for the perambulator is also called a coverlet.

A cosy cot cover is worked with blue and cream double knitting wool, and besides being very warm will outwear any of the woven variety. The necessary materials are 1 lb. of double-knitting wool in blue for the centre, 6 oz. of cream for the border, and a bone crochet hook, No. 8. These produce a cover measuring 49 in. long by 39 in. wide, but the size can be varied.

Begin by making 134 chain, and work the first row thus: Treble in the 5th chain from the hook, then treble in each chain to the end of the line. Make 2 chain, turn, and in the second row miss the first stitch over which the 2 chain stands, as this will represent one double crochet. Then double-crochet in each treble to the end of the row, taking up the back loop only. Make 3 chain, turn, and commence the third row by missing the first double chain.

Do one treble in each stitch to the end of the line, taking up the back loop only; the last treble will be worked in the top of the 2 chain. Make 2 chain, turn, and then repeat the second and third rows alternately 53 more times.

For the border, use the cream wool, and work all round thus: Do 2 treble under the side of the trebles on the left side of the cover, and 1 treble in the double crochet; then across the ends there will be 1 treble in each stitch. At the corners put 2 treble, 2 chain, and 2 treble right in the cornermost stitch. In following rows there will be 1 treble on each stitch, and 2 treble, 2 chain, 2 treble under the 2 chain for the corner. There are 11 border rows in the model illustrated, the order being 5 cream, 3 blue, and 3 cream.



Coverlet for a baby's cot, made after the pattern given in this article.

Cot or perambulator covers may be made in linen or wool blanket cloth. The former may be embroidered and hemstitched in a contrasting colour, the latter bound with satin ribbon and either worked in coloured wools or suitable designs appliqué. *See* Appliqué; Bedspread; Quilt.

COVERT COATING. This is a tailor's cloth in neutral shades, heavier than the similar-looking gabardine cloth, and the front edges of coats and raincoats made from it are less inclined to roll at the flap. Made both in worsted and woollen cloth, it shows a steep and pronounced screw twill, and the colouring is usually raised light and dark in the same thread.

Good covert coating wears well, but has been imitated in light and cheap makes, although these are more usually called gabardines.

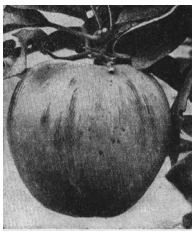
COWHEEL. Boiled cowheel is a nutritious dish. To prepare it, wash the heel thoroughly, and boil it for 1-3 hours in sufficient milk and water to cover it. The milk and water may be mixed in any proportions. Add one large sliced onion and a little salt, and when the meat is cooked take it out and keep it hot. Thicken the liquor with flour, using 1 oz. to every pint of liquid, and mixing the flour thinly with cold milk before adding it. Stir the sauce till it boils, then add 1 teaspoonful chopped parsley and seasoning, which should include a few drops lemon juice and a light dust grated nutmeg. Arrange the pieces of the heel on a hot dish, pour over the sauce, and border with toast sippets.

An excellent family broth is made by dividing one boiled cowheel into quarters and putting it in a saucepan with 3 pints cold water and a small teaspoonful salt. Bring to boiling point, skim it well, and add 1 oz. each of carrot, turnip, onion and celery cut into dice. Let the soup boil for about 1 hour, or until the meat slips off the bones. Then take out the meat and bones, cut some of the best pieces into dice and put them back into the soup with 1 oz. rice. Boil the broth again until the rice is thick, then season the whole carefully, adding a tablespoonful of chopped parsley and a dash of lemon juice. Serve the soup with toast cut into dice. If a cowheel which has not had the preliminary boiling is used, it will require 3 or 4 hours' cooking before the meat leaves the bones.

COWPOX or Vaccinia. This is a mild, contagious disease of the cow in which vesicles or blisters appear on the udders and teats. The lymph obtained from these vesicles, calves being used for the purpose, is the material used for vaccination against smallpox. It does this by producing vaccinia in the human subject. There are strong grounds for believing that human smallpox and cowpox are the same disease, or, at any rate, that both diseases have had the same origin, that is, from one type of micro-organism whose progeny show differences according as their transmission has been through man or cattle. *See* Smallpox; Vaccination.

COWSLIP. The popular name of Primula veris. This is a well-known wild flower, common in meadows and open woodland. It is the parent of the auriculas and other spring-flowering favourites and will flourish in moist places in the garden.

COX'S ORANGE PIPPIN. This apple is the finest flavoured in cultivation. The fruits are at their best in November and December. It is self-sterile and does not fruit well unless it is planted among other free-blossoming varieties, e.g. Worcester Pearmain. *See* Apple.



Cox's Orange Pippin, a good dessert apple.

CRAB: How to Prepare. It is of the greatest importance that a crab should be perfectly fresh and in good condition. It should be heavy in comparison to its size, with large claws, and the shell free from white incrustrations, these denoting that the fish is aged and probably stringy. Crabs are at their best from May to August, but, like other shellfish, with the exception of oysters, are far from being digestible, and should be eaten sparingly and never given to invalids. A crab when bought at a shop is already boiled.

To dress a crab break off the large and small claws, remove the underneath portion and all the flesh from the shell, also the little bag near the head, usually full of sand, and throw away all bone and the long greyish pieces termed dead man's fingers. The flesh is of two kinds, some firm and white, the rest soft and dark. Separate the former into shreds with a fork, also the meat from the claws after cracking them. Mix the dark soft meat with about 2 tablespoonfuls each of fresh breadcrumbs and oil and vinegar, and seasoning to taste. Season the shredded white meat, but keep separate from the remainder.

Wash and dry the empty shell, chipping off the under portion up to the faint line which serves as a guide. Fill the shell with the two mixtures, arranging them alternately, so that they appear in dark and light stripes, heaping them higher in the middle than at the sides. Decorate with lines of finely chopped parsley, and force a little butter round the edge with a forcing bag and pipe. Place the crab on a fancy paper or on a bed of fresh salad.

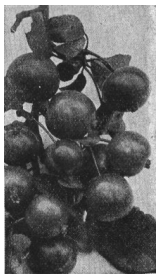
For a quickly made savoury dish, prepare some rounds of crisp, neatly trimmed buttered toast, and keep them hot. Melt 3 teaspoonfuls of butter in a chafing dish, stir into it 1 tablespoonful of flour and then ½ pt of milk. Stir these until they thicken, then add the meat from a medium-sized crab, seasoning it with cayenne, salt, chopped parsley, 2 teaspoonfuls of Worcester sauce and 1 oz ot grated Parmesan cheese. Heap this mixture on the toast and serve hot.

Potted crab is a good fish paste. Remove all meat from the shell and pound it, adding salt, cayenne, mustard, and vinegar to taste. With a wooden spoon rub it through a hair sieve, and press it into small pots, which must be clean and dry. Bake slowly for 30 min. and then leave them until cold. Pour on the top of each pot melted mutton fat, to the depth of about ⅛ in., taking care not to move the pots until the fat has set and hardened.

Crab Croquettes. An excellent fish course is made by pounding the flesh of a crab to a smooth paste, and adding half the quantity of fine breadcrumbs, with enough melted butter to bind the mixture. Season it with lemon juice, pepper and salt, and make it into small rissoles. Coat them with beaten egg, roll them in breadcrumbs, and then fry them to a light brown.

Crab Pie. Crab pie or partan pie, as it is called in Scotland, can be made as follows: Pick all the meat out of a freshly boiled crab, mixing dark and white meat together with a seasoning of salt, cayenne, oil, and vinegar. If the mixture is too soft, work in a few bread-crumbs, put the whole back into the shell, strew it over with crumbs and grated cheese, mixed in equal parts, and bake it in a quick oven until lightly browned. Serve the pie hot, with thin slices of brown bread-and-butter, cayenne, and sprigs of prepared watercress.

CRAB APPLE. The common wild crab (Pyrus malus) is used as a stock on which to graft standard apple trees, and thus serves a very useful purpose in gardens. There are many ornamental crabs valued for their blossoms or fruits or both. The Siberian crab (Pyrus baccata) makes a large tree which is beautiful when in bloom in spring and its fruits make excellent jelly. The crabs named John Downie, Dartmouth and Transparent bear handsome fruits of decorative value. Pyrus spectabilis, floribunda, Schiedeckeri and Eleyi are grown for the sake of their exquisite spring blos-soms. All four are hardy, and thrive in ordinary soil.



Crab Apple. Cluster of fruit.

Crab Apple Jelly. Alter being washed and stalked, but not pared or cored or flavour will be lost, the fruit should be cut in halves with a plated knife. Put 3 Ib. thus prepared in a pan with sufficient cold water to float them— probably about 3 pints. The thinly pared rind of 1 lemon is added and the fruit boiled gently until soft, but not in a mash. The juice is strained through a jelly bag or tammy-cloth, the fruit being pressed gently but not squeezed or the jelly will be cloudy.

After rinsing out the pan the juice is put back into it, with ¾ pint of good white sugar to each pint of juice, and the jelly boiled quickly with the lid off the pan. It must be well skimmed all the time, and a few of the pips may be peeled and stirred in. When a small portion of the jelly sets firmly on a plate, it is ready to be poured off into clean, dry pots. These should be securely covered and stored in a cool, dry place.

CRACKER: For Christmas. This harmless indoor firework may be a tiny bonbon of ordinary shape in a brightly coloured paper covering, or one of the giant variety, either bolster or fancy shaped, to be suspended from the ceiling at a Christmas party and containing all sorts of toys and trinkets. Fancy crackers are quickly trimmed with small dolls, holly or flower sprays, etc. Centre pieces can be easily made by using a gilded or silvered basket decorated with coloured berries and tinsel ribbon and filling it with pretty crackers, or the crackers may be suspended in a toy aeroplane. By the addition of some little ornament or flower the simplest crackers can be transformed into decorative ones. The tiny bonbons may be used to surround a Christmas cake, placed upright and held in position with a ribbon until the cake is cut and the crackers distributed among the guests. *See* Christmas.

CRACKLE WARE. This term is applied to Chinese and Japanese pottery whose surface is covered, partly or wholly, with a network of fine cracks. They vary in size from tiny meshes like fish-roe and pigskin up to ostrich-egg effects, and the still wider fissures called ice-cracks. One form resembles trout scales.

Crackle is produced intentionally by the unequal contraction of the body, and should not be confused with the accidental crazing of the glaze seen in some European ware, both old and new. Black inks or red ochres, sometimes both, are rubbed in to make the lines prominent. The oldest pieces, which are Sung ware, go back nearly 1,000 years, and a good apple-green, turquoise or celadon crackle is highly prized.

CRADLE. The cradle is a very old piece of furniture, but the oldest existing examples probably date from the 16th century. In the 18th century, following the French example, some were made in very elaborate styles, being panelled or carved and inlaid, but the ordinary type were of plain oak or other wood. In the 19th century iron cradles were introduced, but these soon gave way to wicker ones. Cane is also sometimes used, but the cradle itself has disappeared in favour of the cot in many nurseries.

It is never wise to put much lace on a cradle. Narrow Valenciennes eased on to the muslin covering is permissible, but the better trimming is to frill the material itself.

A usual type of cradle is about 2 ft. long, 14 in. broad, 6 in. to 12 in. high. The cradle may have a hood over one end as in the bassinet type, or a canopy formed from some light and porous fabric, preferably muslin, and lined with a darker piece of the same material; the object being to provide the requisite shade and yet allow free ventilation. When in use the cradle must be kept scrupulously clean, and free from any rough edges or projections which are likely to disturb the rest of the the infant. *See* Baby; Cot.

In surgery the term is given to an appliance which protects an injured limb in bed. *See* Bed Cradle.

CRAMBO: How to Play. Crambo is a good game for adults, and is suitable for any games party. Each player is given two slips of paper, distinguished from each other in some way. On one of these he writes any noun that occurs to him, and on the other a question.

He then folds each paper over and hands it to the person in charge. The nouns are put into one bowl and the questions are put into another. When they have been well shaken up they are handed round once more, each person taking a noun and a question. His task then is to write a verse answering the question and including the noun.

A time limit should be set, and when it has expired the papers on which the verses have been written should be collected and the results read aloud. Dumb Crambo (q.v.) is an entirely different game.

CRAMP. The commonest form of cramp, which is a local painful spasm of a muscle, occurs in the calf at night, when one wakes suddenly with an excruciating knife-like pain, and finds the calf like a hard ball. The pain may pass off after a moment or two as suddenly as it appeared. Gouty or rheumatic tendencies, exposure to cold or damp, and over-fatigue are the commonest causes.

Cramp is not uncommon in pregnancy from pressure on the nerves supplying the legs. It is also a symptom of the neuritis produced by chronic alcoholism. There is a form of cramp which is caused amongst other things by excessive tobacco smoking. After walking a short distance cramp occurs in the calves; this passes off in a short time, but recurs when a short distance has again been covered; so that in taking a walk it is necessary to make frequent halts.

In treating cramp, rub the part vigorously with the open hand, alternating this with massage with the fingers. When the acute spasm has passed off rub in well any household liniment, wrapping the part immediately afterwards in cotton-wool to prevent chilling. People subject to muscular cramp will find the following liniment of the greatest service:

Chloral hydrate	1 oz.
Menthol	1 „
Camphor	1 „

The liniment should be mixed well in a mortar until of a syrupy consistence, and used externally, rubbing in well. Where the tendency to cramp at night is associated with flatulent indigestion, it will be found helpful if a teaspoonful of sal volatile in a little water is taken at bedtime.

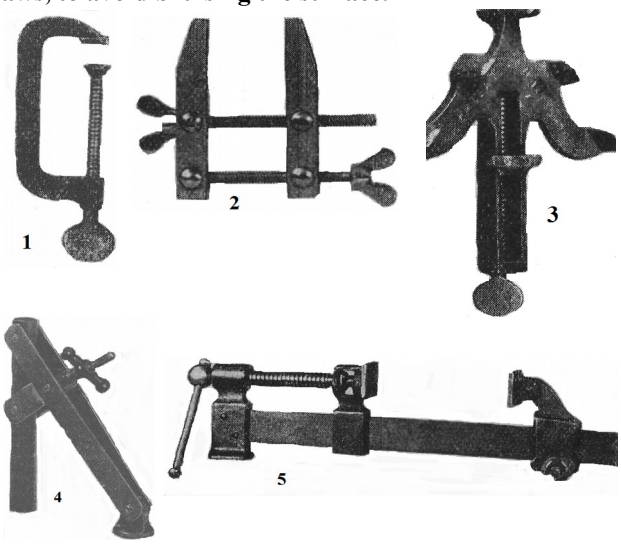
Stomach cramp is a common symptom in indigestion. The pain may be the result of sudden distension of the bowel with gases caused by abnormal fermentation of the contained food, or the spasm may be due to irritation of the nerves supplying the stomach and intestines. Apply a hot-water bottle and give bicarbonate of soda and carminatives. *See* Colic; Muscle.

Cramp in Poultry. Cramp is a complaint to which both chickens and ducklings are subject. It generally affects the legs, causing the bird to squat down helplessly, and is usually brought on by damp surroundings. The condition is sometimes liable to be confused with leg weakness.

The only cures for cramp are warmth and friction to restore the circulation. Rubbing the legs freely with embrocation, provided the bird is kept in a warm place while under treatment, will generally effect a cure. *See* Poultry.

CRAMP: The Tool. The tool named a cramp is used for tightening the joint between two pieces of wood or other material, and it frequently forms an integral part of a small machine such as a mincing machine, which can thus be readily attached to a table. It is sometimes called a clamp.

Ordinary woodworkers' cramps are made in a very light pattern, comprising a light steel bar bent to shape, and one leg screwed and fitted with a clamping screw. A superior pattern called the G-cramp is made of solid cast metal, and will last for years, especially if fitted with a clamping screw having a square-sectioned thread. Such cramps are made to hold from 2 in. to 12 in. in width. Parallel cramps are made with two hard steel jaws, which are drawn together by two hand screws. They are very useful for small metal work of all kinds, and will hold work up to 1¾ in. in thickness. Corner cramps are used to hold the two parts of a picture-frame or other mitred work while the joint is being fastened. Sometimes four of these cramps are used with a tensioning bar between them, and adapted especially for picture-framing. With all types it is desirable to interpose wood between the work and the jaws, to avoid bruising the surface.



Cramp: various types used for special purposes. 1. G-cramp, with square thread screw. 2. Toolmakers' parallel cramp. 3. Corner cramp. 4. Bench-cramp. 5. Sash cramp.

Sash cramps or bar cramps consist of a long steel bar about 1¼ in. deep and ¼ in. thick, from 24 to 48 in. long. At one end is a strong upright with a square-thread cramp screw which pushes a sliding jaw along the bar. A movable jaw is arranged to be fixed by means of a steel pin to any desired position on the bar, and by this means all classes of work can

readily be held, up to the capacity of the cramp. It is of great use to the amateur who undertakes the construction of doors, cabinets, and other large work.

A bench cramp is useful to carvers and other woodworkers, as by its aid the work is held down on the bench. The tool comprises a circular bar that is inserted into a hole bored in the bench top. The cramp screw presses the long bar tightly on to the work, which is thus securely held in position. *See* Glue; Picture.

CRANBERRY. Those who have a moist site with peaty soil may grow cranberries, but they are very rarely cultivated in gardens.

The plant is a slender, wiry, trailing shrub, with small red acid berries. It grows wild in England and Wales and in Scotland. Its botanical name is Vaccinium oxycoccos. The whortleberry and bilberry are closely related to the cranberry. *See* Bilberry.

How to Cook. To stew cranberries, put in a stewpan 1 lb well-picked fruit, just enough water to cover it, and at least ¾ lb. sugar. Let it simmer slowly until soft. Stewed cranberries are best served cold with custard or junket. To relieve the acidity apples are often stewed with them in the proportion of ½ lb apples to 1 lb. cranberries.

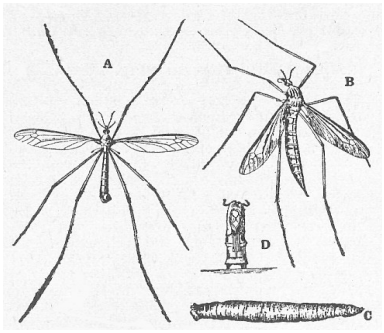
Cranberries make appetising condiments for meat and poultry dishes. A good chutney is prepared by putting 2 quarts of the pickled berries into a pan with 3½ lb. white sugar, 1 lb stoned, coarsely chopped raisins, the thinly pared and finely chopped rinds of 2 oranges, and ½ lb. chopped onions. Add ½ pint good vinegar, the strained juice of the oranges, ½ oz. mustard seed, and a level teaspoonful each of ground ginger, powdered cloves, and cinnamon, and a little salt and pepper. This is boiled until it is thick, and is then bottled.

Cranberry Jelly. Cranberries are excellent as a jelly to vary red currant jelly with venison, roast mutton or jugged hare. Taking 3 lb. of the fruit, pick over and wash the berries, put them into the preserving pan with 3 pints cold water, and let them boil until soft and broken.

Strain off the juice through a fine hair sieve, or through a jelly bag, pressing, but not rubbing down the fruit, or the sparkling clearness of the jelly will be spoilt. Add 1 lb. loaf sugar to each pint of juice, and boil it without the lid until it jellies on being tested on a plate. It can then be poured into jars and stored. It keeps some months without deteriorating.

Cranberry Sauce. A sauce which is specially good with turkey, though it may well be used with other poultry, is simply made by simmering a pint of cranberries in a gill of water until they are soft, and adding 3 oz. of white sugar and a glass of port wine. The liquid is then re-boiled, seasoned, and strained ready to use.

CRANE FLY. The larvae or grubs of the large, awkward, long-legged fly known familiarly as Daddy Long Legs are very destructive of all kinds of garden crops. These pests are, however, chiefly found in gardens which have been recently converted from grass or waste land, or where the grass and weeds have been abundant the previous summer. Sods of turf buried in the ground will attract them. Where the grubs are numerous an application of semi-refined naphthalene at the rate of 2 to 2½ oz. per sq. yd. is worth a trial. The naphthalene should be worked into the soil, after which a thorough watering is advisable. This should not be used on seed beds just about to be sown. *See* illus. below.



Crane Fly or Daddy Long Legs. A. Male. B. Female. C. Larva. D. Pupa case. (By permission of H.M. Stationery Office and the Ministry of Agriculture))

CRANE'S BILL. This is a popular name given to the hardy geranium. This is quite a distinct plant from the geranium (really pelargonium) used in summer flower beds. *See* Geranium; Pelargonium.

CRANK. This is a bent axis in any form of machinery, and is used as a driving or driven means of transmitting power by radial motion. To name but a few common forms, there is the pedal crank of the bicycle, the starting handle of a car, the crankshaft of any engine. In fact, any form of leverage working through a radial motion by means of an off-set arm becomes a crank.

CRANKCASE. In its widest sense this term relates to the cavity in which works the crankshaft, and very often the camshaft, the timing gears and the oil pump of an internal combustion engine such as that employed in the motor car. This cavity is included between the sump at the lower part and the casting forming the upper part of the crankcase.

In nearly all motor car engines this casting is integral with the cylinders and the flywheel housing, as well as with the upper part of the crankshaft bearings. The upper part of the crankcase and the parts with which it is associated form one of the largest and most complicated components on a car. In some cases the crankcase is made of aluminium and the cylinders form an independent casting bolted thereto. This method of construction does not, however, produce such a rigid engine.

The crankcase or cavity contains, in addition to the parts mentioned above, the following: magneto or

distributor driving shaft, dynamo shaft, oil pipes, oil filter, and in certain cases the troughs for the dippers on the big-end bearings.

The crankcase casting is provided with seatings for the electrical units, timing gear cover, fan bracket, water circulating pump, and other minor parts. It is also formed with bearer arms by means of which it may be bolted to the car frame, or with seatings to which such arms may be secured.

In most engines the gear box is bolted up to the flywheel housing or to an intermediate casting or clutch casing, and the flywheel housing carries bearings or attachments for the clutch, brake, and accelerator pedal bearings.

When the cranlscase is of aluminium, studs are always firmly screwed into the metal for the attachment of other parts. Set bolts are never used, as the screwing in and out would damage the soft aluminium. Studs must never be allowed to work loose, as the thread in the hole would soon be destroyed.

All oil-retaining joints should be made with thick brown paper coated on both sides with gold size, or with a suitable jointing compound. When the co-acting faces are roughly finished, or one of them, such as the sump, is made of flexible sheet metal, a cork washer or gasket may be used.

In motor cycle practice a crankcase is usually divided through the centre, i.e. vertically instead of longitudinally. In all other respects the principle is virtually the same, except that the one-piece casting, meaning the cylinder and top half of crankcase in one, is not employed . *See* Gasket; Lubrication.

CRANKSHAFT. The crankshaft is one of the oldest methods employed for mechanically converting power developed by a reciprocating motion into a rotary force, and as used in internal combustion engine practice differs only in accordance with the needs of the design of the engine. As commonly employed, there are the throws or cranks, according to the number of connecting rods and the main journals.

The crankshafts of modern internal combustion engines show considerable variety both in the number of cranks combined in one shaft and in the arrangements of the cranks and main bearing journals.

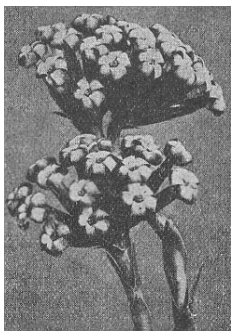
In nearly all cases the crankshaft is designed to run in anti-friction bearings, which are of the split type formed of brass or phosphor bronze shells, lined with white metal; in fact, practically identical to the big-end bearing. The perfect rotary balance of a crankshaft always receives careful attention, because with this lies to a great extent the perfectly smooth running of the engine. *See* Big-End; Internal Combustion Engine; Motor Car.

CRAPE: A Dress Material. Crispness and a crinkled surface characterise all crapes and form the justification for the name. In the manufacture of such fabrics the threads are twisted so much beforehand that when they are woven they do not naturally lie straight, and this feature is seen alike in wool, cotton and silk crapes.

Black silk crapes used for mourning are made more crisp by being treated with shellac, and as this is not a gum soluble in water it tends to remain. The stiffness of such crapes returns if the fabric after wetting is dried before the fire. Waterproof crape should be asked for. In wool or cotton crêpes, as used for summer and indoor dress, the original character returns after washing, although cotton crapes should not be ironed. *See* Crêpe-de-chine; Mourning.

CRASH: A Linen. Originally a rough linen imported from Russia and used for kitchen towelling, crash has now a wider range of meaning. Coarse fabrics of various compositions sell under the name, including rough linen towelling, dress and household linens, unbleached or in fancy colours. *See* Linen.

CRASSULA. Plants of the genus crassula, popularly known as thick leaf, require greenhouse treatment. All the species may be successfully grown in a compost of two parts loam, one part leaf-mould, and a sprinkling of sand, with some broken brick or mortar rubble. Propagation is by cuttings of the tops dibbled into sandy soil, under glass, which strike more readily if laid out to dry before being inserted. They need a sunny, airy greenhouse and little water in winter. It is usual to shorten the shoots which have flowered in late summer, and to re-pot in spring. The best species are: coccinea, scarlet, 18 in., a summer bloomer; jasminea, white, 1 ft., spring bloomer; and actea, 1 ft., white, at its best in September.



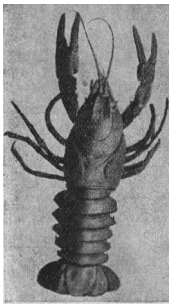
Crassula. Flower heads of the scarlet coccinea.

CRATE. Crates are made both of wicker and of wood, and their main use is for holding goods that are sent away by rail or road. China, crockery, glass and similar wares are usually packed in crates for transportation. Crates made of slats of wood are largely used for conveying poultry, rabbits and other domestic animals by rail, as they are for bicycles, perambulators and certain articles of furniture.

CRAWFISH. This crustacean is a species of rock lobster common round the British coast. It is larger than the lobster and is cooked in much the same way. The flesh, however, is coarser and the flavour inferior, though it is often substituted for lobster in salads. It is totally different from the crayfish.

CRAYFISH. The small freshwater crayfish found in the rivers of Great Britain is of a delicate flavour and is highly esteemed as an article of food. Quantities of crayfish are imported into Great Britain from the Continent, the home supply being limited. They are

usually boiled before being put on the, market; where this has not been done they should be plunged in boiling fish stock for about 10 minutes.



Crayflsh, the delicately flavoured shellfish found in British rivers.

Soup made with river crayfish is considered a great delicacy. A quart of fish stock will be required with 18 crayfish. Remove the gut from the centre fin of the tail of each, shell the fish, and pound the shells and half the tail-meat with 2 oz. butter and 2 boned anchovies wiped free from brine. Put this pounded mixture into a saucepan and stir it with a wooden spoon over the fire until it is hot; add 2 oz. washed rice and fry the whole for 5 min., during which it must not be allowed to colour even slightly.

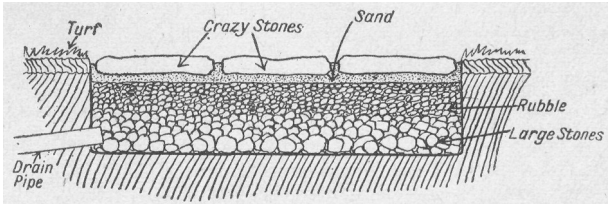
Add the fish stock and a small onion stuck with 2 cloves; allow these to simmer until the rice is soft, stirring frequently. Soak the soft part of a French roll in milk and add it before rubbing the soup through a hair sieve. Reboil the soup, pour in ½ gill cream, 1 teaspoonful lemon juice, and some seasoning, finally adding the remainder of the meat from the tails, cut into dice. Serve the soup with croutons or sippets of hot crisp toast. *See* Mayonnaise.

CRAYON: How to Use. The variously coloured pencils made of chalk or pipeclay and used for drawing purposes are known as crayons. In addition to the use made of them by artists, etc., they form popular presents for children, especially when accompanied by uncoloured picture books.

Cheap crayons should not be given to children, since they are apt to melt quickly in a warm hand and are a source of real danger if placed in the mouth. Crayon drawings made on paper which is not specially prepared for the purpose easily become smudged. They may, however, be fixed by washing the paper with a strong solution of isinglass. When it is dry, the drawing may be made upon it, after which it should be inverted and held horizontally over steam. The steam melts the size, which absorbs the crayon, and the drawing thus becomes fixed. This process may be repeated several times while the drawing is being made, the effect being increased on each occasion.

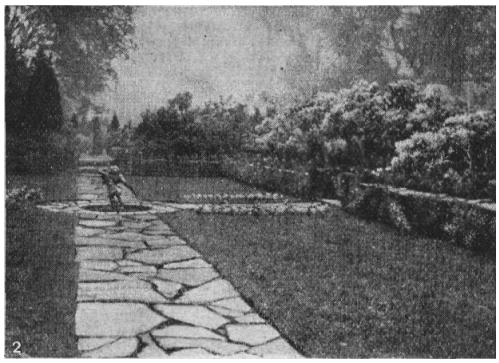
CRAZY PAVING. The name of crazy paving is applied to stone paths, composed of random or odd-shaped pieces roughly fitted together to preserve a generally straight line at the edges of the path. Crazy paving is not restricted to paths, but has many applications as a paving for courtyards, the surround to the base of a sundial, and for terraces and other ornamental features in the garden.

The materials are often obtainable from housebreakers, or from a stone quarry, while old paving stones are excellent for the purpose when they are available. They generally arrive somewhat broken, which is no detriment, as the success of the crazy paving depends upon irregularity. No two stones are alike in form or size, but the whole must be so arranged that the boundaries of the pavement are in regular lines. It is not sufficient to lay the pieces of stone directly upon the ground: a properly drained subsoil and a suitable bed for the stones are essential.



Crazy Paving. Fig. 1. Section of path showing how the flags are set in sand on a foundation of rubble and large stones to ensure proper drainage.

The proper method of constructing such a path or paved area is first to mark out the site, using pegs and the garden line to define the boundaries. The turf and soft top soil are removed to a depth of at least 6 in., and more on a very light soil. The earth is well rolled or rammed, and broken brick, gravel or other ballast or hard core laid down and covered with a layer of finer but rough material, so as to provide drainage for rain water. Regard must be paid to the falls or levels of the path, and in any hollow places a few rough agricultural drain pipes will prevent pools of water forming on the pathway. In many cases the drain pipes can be so disposed that the rain water is directed towards the flower bed or other location where it will be beneficial.



Crazy Paving. Fig.2. Irregularly shaped flags worked into a path and linking up divisions of a large garden.

The laying of the stones can next be commenced, and it is worth while to sort roughly over the materials and assemble the pieces in groups according to size. The stones vary in thickness, size and shape. For the edge of the path use the straightest edge of the stone and commence by laying a bed of sand upon which to set the stones. The stones are set upon the sand by moving them about slightly and bedding them in, using a trowel to manipulate the sand, and a beetle or heavy rammer to beat down the stone. Every stone must lie firmly without tendency to rocking or movement, otherwise it will never settle. Lay to the outer edges of the path first, and then fill in the centre, but complete the whole width of the path as the work proceeds.

When finished the path should present a level surface; any irregularities in thickness of stones may be compensated by adding more sand underneath to make up for any deficiency in thickness. The stones are sometimes set in cement mortar especially when it is desired to prevent the growth of grass and flowerets between the stones. In this case the cement mortar is laid upon the sand and the surface of the stones brushed over with cement slurry completely to fill all crevices. The path should be washed later on, so that the natural colour of the stones is revealed.

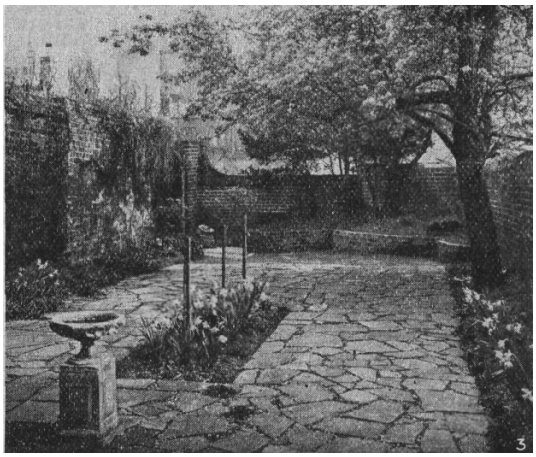


Fig. 3. Crazy paving in a small town garden, the old stones forming an ideal background for flowers throughout the year. (Fig. 2, R. Neal & Sons, *Wandsworth; 3. Humphrey & Vera Joel)*

An edging of brickwork forms a pleasing finish to a large area of crazy paving. An alternative method is to set larger stones directly upon the grass, when a Japanese or stepping-stone type of path is wanted. To do this the turf is cut away to the shape of the stone, which is then bedded on sand laid directly upon the earth.

A reasonable estimate is that a ton of stone will cover anything between six and ten square yards of crazy paving. See Cement; Concrete; Path; Wall.

CREAM: Its Food Value. Cream consists of the fatty globules of milk in which are contained the carbonaceous portion constituting the principal food value. It has been found, on analysis, to contain 74-0 parts water, 2-5 protein, 18.5 fat. 4.5 carbohydrates, .5 ash. All the nutriment contained in cod-liver oil is contained in cream, and invalids and children for whom the former is recommended find in cream a perfect substitute which is much pleasanter to the palate. Consumptives benefit from a. diet in which cream has a liberal part, and it is much given to other kinds of invalid.

Cream is separated from milk for commercial purposes by mechanical separators. To separate it at home without mechanical aids, simply allow the milk to stand from 8 to 10 hours. The fatty globules, which contain the cream, are lighter than the other constituents of the milk, and they thus rise to the surface, where they combine and are skimmed oft. The milk should be fresh and immediately placed in a wide, shallow vessel and left to stand in an even temperature of about 52° F. in summer and 60° in winter.

Double cream is obtained by allowing the milk to stand for 24 hours before being skimmed. The vessel in which the milk is placed should on no account be covered so that the air is excluded, but with a piece of muslin in order to protect from dust or flies.

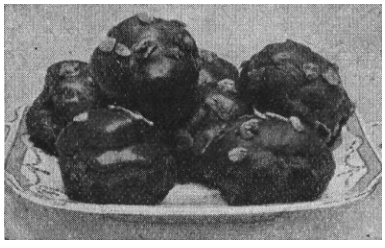
Cream can be kept fresh for two days if it is just brought to boiling-point without being allowed actually to boil. If sugar is added, it will keep in a cool place for about 36 hours. It can be obtained in hermetically sealed tins, and in this form should keep for a considerable time. Once the tin is opened, however, the cream should be emptied into a basin or jug and used immediately.

Whipped cream goes further and is used for many sweets. A little sugar, wine, or flavouring can be added before cream is whipped, if desired. The cream should be poured into a cold basin and whipped with an egg whisk in a cool place or in a current of air, so that cold air can be incorporated into the cream to make it light and stiff. Care must be taken that it is not over-whipped, or it will turn into butter.

Simple contrivances for reconstituting cream from butter and milk are available.

In addition to its chief use for the oily substance that forms on milk, the word cream has several other meanings, all, however, derived from the prime one and all implying some form of excellence. It is used for cosmetics, such as face cream, and for certain mixtures for cleaning boots; also for various preparations in which chocolate is the main ingredient, and for other sweetmeats. *See* Butter; Clotted Cream; Ice; Milk; Trifle, etc.

CREAM BUN. These cakes are also known as cream puffs. To make them, melt 2 oz. butter in a saucepan, adding half pint hot water, and let the two boil. Take the pan off the fire and beat in 4 oz. dried and sieved flour. Add a few grains of salt and, with a wooden spoon, beat the mixture briskly until all lumps have disappeared; then put the pan over a slow fire and stir the mixture until it can be rolled about without sticking. If overcooked the butter will ooze out, and the panada, as the mixture is termed, will be spoilt. When cooked let it cool, and beat in 2 whole eggs and 1 extra yolk, adding each egg separately and working it in. Add vanilla essence and castor sugar to taste.



Cream Bun. Plate of these light cream pastries covered with coffee icing and crystallised flowers.

To form the cakes use a forcing bag with a plain pipe, but if this is not available use 2 dessertspoons,

forcing or shaping small round heaps of the mixture on to a greased baking sheet and leaving a space of 2 in. between each cake. Bake them in a moderately slow oven for about 30 to 45 min. When cooked they should be light, hollow, and biscuit-coloured.

When cold cut each cake open down one side, and fill in whipped sweetened cream. The buns when cold are coated with chocolate or coffee icing and sprinkled with crystallised flowers. *See* Icing.

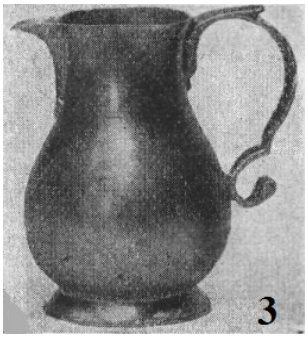
CREAM CHEESE. While most dairies have their own methods of making cream cheeses from either double cream, containing 50 per cent, of fat, or from thin cream, thickened with rennet before drainage takes place, the following method is a simple one for making about six ¼ lb cheeses from a quart of cream. The cream should be cooled to 65° F. and a drop of rennet, together with a little starter, should be added immediately the cream is cooled. This starter may be either a pure culture of lactic acid bacteria used by most cheesemakers, or it may be a little clean sour milk. On no account should the cream be soured naturally, as the flavour depends on its freshness. The cream is then left for 8 to 12 hours before draining. Salt may be added at the same time as the rennet, one teaspoonful to a quart of cream being ample.

The cream is drained in fine longcloth spread over a wooden form, which is provided with a loose board which can be weighted to press out superfluous moisture. The longcloth is thrown over the form and pressed down to the level of the table on which it stands and the cream then poured in to the depth of 1½ in. covering the inner area of the form. Drainage must be gentle at first, or the mesh of the cloth gets filled with cream. The cloth should be opened once after the first half-hour and scraped down, when the cream should be re-weighted with a 14 lb. weight. The cream should be ready to mould in 3 or 4 hours. The cheese is filled into small moulds lined with parchment paper. A wooden knife should be used. On removal from the mould the separate cream cheeses are wrapped in muslin. *See* Cheese.

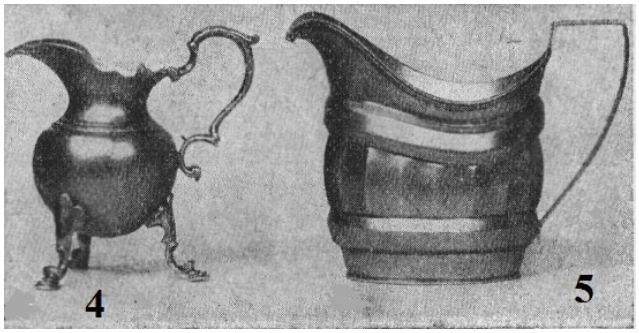
CREAM JELLY. Prepare half a pint of claret or raspberry jelly, using twice as much gelatine as usual, or, if preferred, use a 1-pint packet of jelly, and prepare it as directed on the packet, but using only half the stated amount of water. Put half a pint of good cream into a basin, whisk it until it thickens, but not sufficiently to make it hang on the whisk. Then whisk it gradually into the warm, but not hot jelly, adding any extra colouring or flavouring desired. Continue to whisk the whole gently until it is on the verge of setting, then pour it into a mould that has been rinsed out with cold water. Leave it until it sets, then dip the mould into hot water and slip the jelly out on to a dish. It may be decorated by putting round the cream a border of chopped sweet jelly, of a contrasting colour.

CREAM JUG. The earliest cream jugs known to collectors are silver ones, having a bellied bottom and straight neck, no lip and simple bow handle. They are sometimes found in sets of three small ones and one somewhat larger. Early in the 18th century the short low-bellied jug with a small lip and bow handle came into use. These jugs stood on a ring foot, but soon they were made with three cast feet, and this type became popular. The body was decorated with chasing, and as other elaborations were introduced the lip became an elongated spout, and for the bow a shaped handle was substituted. The three feet were replaced by a round foot and a short stem, as is seen in two of the illustrations.





Cream Jug. Antique examples in silver. 1, 3 and 4. Chased and plain jugs, temp, late George I and early George II. 2.Ornamented with heading, classical period, late 18th cent. 5. Cream ewer, dated 1801 (Courtesy of Spink & Son, Ltd.)



Late in the 18th century, owing to the classical style of decoration in vogue, a less ornate pattern was again adopted. The foot and stem were left, but an oval helmet-shaped body came into fashion. Severity of outline and restrained beaded or reeded ornament were retained, but jugs with fuller bodies and short necks were made. Another style is one in which the foot and part of the body are cut off. Many of these are graceful pieces of work, and many beautiful modern cream jugs are reproductions of 18th century designs. Cream jugs are also obtainable in glass and in china to match services.

CREAM OF TARTAR. This is the common name for the bi-tartrate of potassium. Two to six teaspoonfuls in orange marmalade is sometimes used as a purgative. The Imperial drink, a favourite household remedy for slight fever, may be made by adding a teaspoonful of cream of tartar, a little sugar, and a quarter of a lemon to a pint of boiling water. This tends to keep the kidneys active.

CRÈCHE. A crèche is a daily boarding establishment for infants and young children under school age. The standard varies according to the income of the parents who wish to have their children cared for during the hours they are unable to look after them.

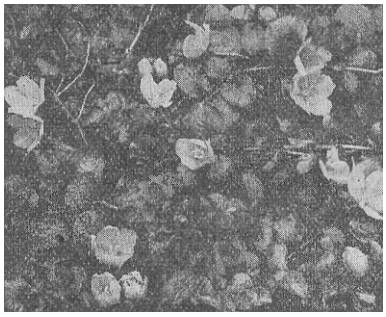
The mother leaves her child or children at the crèche early in the morning, and pays 2d. or 3d. per child. In many cases she also brings the food it requires for the day. If an infant is breast-fed, arrangements are made for the mother to call in the dinner-hour. The children are cared for by the crèche attendants, and frequently bathed and washed, superintended and fed until the mother or guardian calls for them at about 5 o'clock. They are given as much fresh air as possible, amused and trained in orderly ways. Most large cities have crèches in their midst, and information about them can usually be obtained from the local infant welfare centre.

CREDIT: The Legal Aspect. Credit is a matter of agreement. If a lady orders goods and makes no agreement that she is to have credit, the law implies that she is to pay for them on delivery. She should, of course, be allowed an opportunity to examine them before paying. If she wants credit she must agree with the tradesman that she is to have it, and agree how long the credit is to be. Once it is agreed that credit shall be given, the seller of the goods cannot go back on it and demand cash on delivery; neither can he demand payment before the period agreed upon has expired. Thus if the lady buys on the 1st Jan., upon the terms of a month's credit, she has until Feb. 1st in which to pay, and cannot be sued for the money until Feb. 2nd.

The word credit is used by bankers for the money or other reserve which a person has in the bank. In bookkeeping the credit side of the account is the one where payments are entered. *See* Accounts; Banking.

CREEPER. A term correctly applied to vigorous self-clinging plants like ivy which are used to cover walls. It is applied to many climbing plants. *See* Canary Creeper; Clematis; Climbing Plant; Wistaria, etc.

CREEPING JENNY. This is a good trailing plant and useful alike for window boxes, rockeries and hanging baskets. It thrives in shade and bears yellow flowers in summer. The golden-leaved variety, aurea, is attractive. It is easily propagated by detaching rooted pieces.



Creeping Jenny. Leaves and golden flowers of this spreading trailing plant.

CREEPING SAILOR. The common name of creeping sailor is given to Saxifraga sarmentosa, a pretty creeping plant, which is also known as mother of thousands (q.v.). It may be grown in pots suspended in room, window or greenhouse.

CREMATION. When it is desired to have a body cremated, the best course is to telephone or telegraph to one of the cremation companies, who will at once send a representative or give instructions as to what steps should be taken. A special form of application will be supplied, and this must be filled up and signed by an executor or a near relative of the deceased. Among other things the applicant must state that deceased had expressed no objection to being cremated, and whether any near relative of the deceased objects to the proposed cremation; if so, on what grounds.

Procedure and Regulations. Two medical certificates are needed. One is filled up by the medical man who attended the deceased in the last illness, and who has seen and identified the body. The second certificate may only be given by a medical practitioner of not less than five years standing who holds one of certain specified appointments, such as medical officer of health, police surgeon, physician or surgeon to a public general hospital containing not less than 50 beds, or has been appointed specially for the purpose. The registrar's certificate of death must also be produced for inspection by the medical referee of the cremation company. When the medical referee of the cremation company is satisfied that all the requirements of the Act have been complied with, he authorises the superintendent of the crematorium to cremate the remains.

Any form of religious service may be conducted before the actual incineration. Friends may see the coffin placed in the chamber, but are not permitted to witness the burning. The ashes are placed in an urn, which may be deposited in a chapel or buried in a grave or handed over to the friends.

The following is a list of the crematoria in Great Britain, with the addresses to which application should be made:

London:

Golders Green: 45, Nottingham Place, W.

Hendon Park: Abney Park Cemetery Co., Stoke Newington, N.

Little Ilford: Guildhall, E.C.

West Norwood: 58, Temple Chambers, Temple Avenue, E.C.
Woking: 45, Nottingham Place. W.
Birmingham: Kings Court, 115, Colmore Row.
Bradford: Scholemoor Cemetery.
Bristol: 36, Corn Street.
Brighton: Borough Cemetery, Lewes Road.
Darlington: 36, Priestgate.
Edinburgh: Heriot Hill House, Canonmills.
Glasgow: 142, St. Vincent Street.
Guernsey: Foulon Cemetery.
Hull: Hedon Road Cemetery.
Ipswich: Cemetery Gates.
Leeds: Lawnswood Cemetery, Adel.
Leicester: Gilroes Cemetery.
Liverpool: Priory Road, Anfield.
Manchester: 37, York Street.
Nottingham: Wilford Hill Cemetery.
Pontypridd: 31, Gelliwastad Road.
Sheffield: City Road Cemetery.
See Death; Funeral.

CRÊME DE MENTHE. This is a pleasant and wholesome liqueur made from peppermint. It is of light green colour, and the best brands are highly esteemed as digestives. It should be served after luncheon or dinner in liqueur glasses. A favourite method, especially in hot weather, is to serve it frappé i.e. with crushed ice, when it should be drunk through a straw.

Crême de Menthe Square. Take 1 lb. of granulated sugar, 1 teaspoonful peppermint essence, 1 gill water, 1 sheet gelatine, and a little green vegetable colouring. Dissolve the gelatine in half the water in a saucepan, and boil it for 2 or 3 min. Place the sugar with the remainder of the water in another saucepan, and bring it slowly to the boil. Take it off the fire, and when it is slightly cool add the dissolved gelatine, stirring all the time.

Then add the peppermint essence and vegetable colouring to taste. After it has stood for 10-15-min., strain it into a flat tin that has been rinsed out with water. When quite cold it may be unmoulded by dipping the tin into a basin of warm water. Cut the mixture into rounds or squares, or any other shape desired, and roll the pieces in icing sugar. Leave them in the sugar for a day or two, then shake it off, and pack the sweets in boxes between layers of waxed paper.

CREOSOTE. An oily and transparent liquid with a strong penetrating odour, creosote is obtained by heating wood or coal tar, and has a strong antiseptic action; it is less caustic than carbolic acid and is very much less poisonous.

Apart from its use in medicine for certain cases of indigestion and for treating painful teeth, it is employed for creosoting timber, and is of value in the household and garden in preventing wood from rotting. Fences are preserved from decay by painting them with creosote, which penetrates the wood and keeps away insects. In the building of pergolas or garden houses, those portions of the timber which are to be buried in the ground should be treated with creosote. Inside the house, plain furniture and floors can also be so protected, but the penetrating smell is against its use for this purpose. A good disinfectant powder is obtained by mixing one part of creosote with four parts of slaked lime. *See* Disinfectant.

CRÊPE-DE-CHINE. Originally made in China and imitated in France, crêpe-de-Chine is now produced in all the silk weaving centres. Its characteristic appearance arises from the use of hard-twisted silk which is woven without removal of the natural gum that forms about a third of the weight of raw silk. This gum is removed after weaving and the threads exhibit a new fullness and lustre. The cloth is dyed after weaving.

What are called schappe crêpes-de-chine are made wholly or in part of spun silk and are generally firmer and more clothy than those made from raw silk. In addition to the self-coloured fabrics selling under this name there are striped sorts, largely of English make, especially suitable for shirt-blouses and washing dresses. This is one of the most suitable silks for wear next the skin, and can be easily laundered at home in a lather of soap flakes and hot water, allowed to grow tepid before using. Squeeze and knead the garments gently in the lather, rubbing only when it is absolutely necessary. Wring them thoroughly, then rinse them into two bowls of warm and one of cold water, adding a tablespoonful of vinegar to the last. In the case of white crêpe-de-chine, a little blue may be substituted for the vinegar.

Coloured crêpe-de-chine should be ironed as soon as possible after washing, otherwise the colours may run. Ironing is best done by laying the material right side up on an ironing-board or table, smoothing it out, and covering it with a piece of muslin. When nearly dry finish ironing on the garment itself.

CRESOL. Often known also as cresylic acid, this is a light brown liquid which smells like tar. It is a disinfectant, and is employed to make liquor cresol saponatus, which resembles lysol and is used in the same way. In whooping-cough the frequency of the paroxysms may sometimes be lessened by impregnating the air with vaporised cresol. This can be done by heating a large spoon in the fire and pouring in a teaspoonful of cresol or the drug may be put in the lid of a tin which is fixed over a nightlight. Vaporisers may also be bought for this purpose. Cresol is found in most of the proprietary disinfectants on the market. *See* Disinfectant.

CRESS. The term cress is popularly applied both to watercress and the cress which is eaten with the young leaves of the hardy annual mustard plant.

Mustard and cress grow very easily and rapidly, so that a constant supply is always obtainable for small salad. It is a mistake to plant both at the same time, as

the cress grows more slowly than mustard, and should be given a three days' start. *See* Salad.

CRESTING: On Furniture. This term is used for any ornamental detail surmounting a piece of furniture and reaching right across from side to side. It refers to a decorative addition only, not to a constructional part. Cresting may be described as a perforated, carved and gilded, or silvered ornament superimposed above the top moulding, such as is found on lacquer cabinets of the late 17th century. In a chair a crest rail refers to a top rail which has some ornamental character. Chairs of the time of Charles II and William and Mary have decorative crest rails.

CRETINISM. Feebleness of mind is one of the symptoms of cretinism, a condition originating at birth or developing at any time up to puberty, together with a large and perhaps protruding tongue, poor development of hair, swelling of the abdomen, or dwarfing of the body. The disease is due to lack of function of the thyroid gland, which is situated in the neck just below the Adam's apple.

Treatment consists in giving the thyroid extract to make good the deficiency from which the patient suffers, but it should only be undertaken by a doctor.

Under this treatment rapid increase in height may take place, perhaps 5 or 6 in. in as many months. Early cases receiving prompt thorough treatment may grow up into, apparently, normal individuals, though it may be necessary to continue the treatment at intervals throughout life.

CRETONNE. This cotton fabric is un-glazed, and is loomed in several widths, 31 in., 36 in., and 50 in. It is durable and washable and its wide range of patterns and colourings and its soft appearance renders it suitable for curtains and loose covers for furniture, and upholstery. When buying it for furnishing purposes care should be exercised in the choice of the design in order that it may harmonise both in colour and style of pattern with the furniture and decoration of the room. These cretonnes can be obtained in Jacobean designs, in old English flower designs, in bold geometrical patterns, or sprigged with Victorian posies.

As to colour, it should be remembered that deep tones, such as orange or red, are more expensive to produce, and that fabrics in these colourings must be of good quality to obtain pleasing effects. Bright colours in cheap dyes are crude.

When choosing a pattern remember that a large pattern is more costly to make up because the design must be matched in joining the material, thus occasioning more waste than when the pattern is small. Buy rather more material for upholstery purposes than the net quantity obtained by measurement. When making up cretonne into loose covers take measurements and a careful plan of each piece of furniture on hand before attempting to cut the material. Where the widest part of the furniture exceeds the width of the material an extension, or piece to be added by a seam, should be placed on each side, and not on one side only.

In laundering cretonne, pure curd soap, or soap not containing caustic soda, should be employed; bran-water should be added to the water, the latter being tepid. Cretonne should be starched in boiling-water-starch thinned down, i.e. 3 pints of water to 1 pint of starch. Covers for furniture can be dry cleaned by brushing over them a thick paste made by starch and cold water. *See* Cover; Curtain; Upholstery.

CRIBBAGE. This is a card game for two, three, or four persons, but it is most commonly played by two persons only, and the two-handed game is the one that is here described. There are three varieties of cribbage, the five, six, and seven card game, the latter, however, being seldom played. The game is 61, 121, or 181 points up respectively, and a special cribbage board is generally used for scoring purposes.

The full pack of 52 cards is used, and players cut for deal, the one who cuts the lowest card dealing. Ace counts as the lowest card. The cards are dealt one at a time, until five are dealt to each player, and the pack is then placed between the players. Each chooses two cards from his hand, which he places face downwards on the table to form the crib, a hand which belongs to each dealer in turn. As this crib gives a slight advantage to the original dealer, his opponent scores three points or holes, known as three for last to equalise the advantage.

When the cards have been thrown out for the crib the non-dealer cuts the pack and the dealer takes the top card of the bottom half of the cut and turns it up. This card is known as the turn-up, and is used by both players for scoring purposes. If the card happens to be a knave the dealer scores two points, known as two for his heels.

The scoring during the play is as follows, the non-dealer leading the first card. Two points are scored for a pair; that is, if one player puts down a card, say, a three, and his opponent plays a three, the latter scores two for a pair. If the player can follow again with another three, he scores six for a pair-royal, and if his opponent is able to place down the fourth three, he scores 12 for a double pair-royal.

Three or more cards of any suit in numerical succession, as, for example, the three of diamonds, the four of hearts, and five of spades, count one for each card to the last player. Thus a player who completes a run of three counts three points. The run need not be in regular order. Thus in the example given the four might be played, then the five, and lastly the three. If the next player can play a two or a six he scores four points for a run of four, and so on.

When a player plays a card which makes with the cards already exposed a total of 15 pips, he scores two points, 15 two. Thus if a player plays a nine and his opponent a six the latter scores two points. Three or more cards may make up the 15. A score of 15 two and a run may be scored by the same card.

When the total of the pips on the cards approach 31,

the player whose turn it is to put down a card may find that any of the cards in his hand brings the total over 31. In that case he says, "Go," and his opponent has the right of play. If the latter also finds his cards are too high, the player of the last card scores one point for last. If either player can make the total exactly 31 he scores two points. In counting pips on the cards the knave, queen and king count as ten. When both players "Go" or the exact total of 31 is made, the hand terminates, and the two players, beginning with the non-dealer, show their hands and count them.

In this final count the turn up card is also reckoned as part of each player's hand and also as part of the crib. The hands are counted for each 15 they contain, the points being reckoned for each 15 as in play. Every separate combination possible is counted. Thus a king and three fives in a hand count as eight points for 15's, since four distinct 15's may be made. Any pairs count as two points,, any three cards alike as three fives, six points, any four 12 points, independently of the fact that these cards may already have been counted for 15's. Thus three fives count two points for 15's and six points for a pair royal. A run of three, four or five counts three, four or five points. There may be three cards in a sequence and a fourth card which is a duplicate of one of the sequence cards. In that case a double sequence is counted, that is six points, and two points for the pair. Similarly with four cards and the fifth as duplicate. Three of the cards may form a sequence, and the remaining two be duplicates of one card, in which case a treble run of three can be scored; with six points for a pair royal.

When the three cards held by the player are all of one suit he scores three points for a flush, and if the turn-up is also of the same suit, four points. If a player holds a knave of the same suit as the turn-up, he scores an extra point known as one for his nob. The dealer scores his hand after his opponent has done so, and then his crib in the above manner. A flush does not count in crib unless the turn-up is also of the same suit, and then counts five points. A flush counts in addition to any other point also scored. In throwing out cards for crib a player naturally throws from his hand such cards as are likely to be productive of scoring if it is his own crib, and non-productive if his opponent's crib.

CRICK. Sudden painful stiffness, occurring in the neck or back, is known as a crick, and is probably due to muscular spasm, though it is also suggested that it may mean rupture of a few fibres of a ligament or muscle. The treatment is gentle massage with the tips of the fingers, using warm oil, a liniment, or the following: methyl salicylate 1 dram; menthol 1 dram; lanolin 3 drams; vaseline to 1 oz.

CRICKET. The cricket usually shelters around the kitchen fireplace, often excavating burrows in the mortar between the bricks; these may be made untenable by injecting carbolic acid with a fine syringe. It is a very thirsty creature; and a plate of water to which a few drops of formaldehyde has been added will kill many. It feeds on all sorts of scraps and fragments of food that have been left accessible to it; a piece of bread covered with the phosphor-paste sold for the destruction of cockroaches will be consumed readily, with fatal results. Any of the remedies suggested under cockroach may also be tried. Crickets especially favour the large open fireplaces often found in old houses.



Common Cricket of the fireside.

CRICKET. The devotee of this game, which is also played by women and girls, usually provides himself or herself with a bat, and a pair of pads to protect the legs. In addition most players wear gloves to protect the knuckles and the back of the hand, and men wear boots of a special kind. The pads and gloves can be bought in sizes, to suit the needs of the particular individual, from any sporting outfitter.

The Cricket Bat. Undoubtedly the best thing to do when buying a bat is to go to a firm of repute, and take the bat which suits, even if the price be the highest. In taking up several bats, one after the other, it will be found that some do not seem to balance well, some seem too heavy, others too light. But in nine cases out of ten one of them will feel as if it were an old friend. If on examination it seems perfect in every way, this is the best bat to take.

Many batsmen have a great objection to knots, and if there are any near the handle it is always safest to discard the bat. Some batsmen prefer a narrow grain in the wood; others like a wide grain. There is no royal road to success in choosing a bat, and despite their experience and skill the greatest of batsmen will occasionally find that, when they have bought their bat, it will not drive as well as a proper bat ought to do. But anyone who has the right instinct, a little common sense, and knows what he wants will very seldom make a mistake.

Preservation by Oiling

Not so very many years ago cricketers who bought a new bat treated it almost with reverence. They did not think of using it until it had been well oiled for a long time, and they oiled every part of it, except the handle and splice. To-day good batsmen often use a bat which has just come from the maker or a shop, and it is claimed that by a new process in the manufacture bats are hardened sufficiently for immediate use. Nevertheless, it is certain that no wood of any kind has ever been discovered which does not deteriorate if proper attention is not paid to it. Hence batsmen, or most of them, still look carefully after their bats when they are not in use, and more especially during the winter months.

The usual way of oiling to-day is to spread linseed oil on the surface of the front of the blade with a brush such as is used in oil painting, from the bottom about twelve inches upwards. This is done about once a

month, and then the bat is stored upright, in a place which is neither damp nor too highly heated., The theory is that the oil penetrates right through the bat, and that therefore there is no need to oil the back part. If in wet weather the bat gets very dirty, and the owner does not like its appearance, a little fine sandpaper before oiling will do all that is necessary.

Cricket Boots. The most expensive kind of cricket boot is made of white buckskin, but in order to turn out a smart-looking boot at a cheap price, various imitations classed as mock buck are used. There is little to distinguish the real article from the imitation when made up, but most of the latter quickly stretch out of shape and wear into holes. It is better, therefore, to buy good canvas boots, as they are usually more satisfactory in wear and appearance than the mock buck.

As comfort is so essential, the seams on the inside of the boot must not be bumpy or rucked. A chrome sole usually gives longer service than a bark-tanned leather sole, and it is waterproof; but it tends to draw the feet, and persons with hot or perspiring feet should avoid chrome-soled footwear.

Cricket boots are made with and without heels. It is claimed that the heelless variety allows greater foot-flex, but this is really a matter of opinion. The cheapest and most effective cleaning material is pipeclay. In cleaning the boots should not be made too wet. This has a tendency to cause the uppers to shrink if made of canvas, and in the case of buckskin is liable to render the uppers hard and brittle.

CRINOLINE. Originally applied to the stiffening of horsehair and cotton or linen threads used to expand women's skirts, the word came to include the steel and whalebone hoops employed for the same purpose.

Crinoline used for women's hats was manufactured from horsehair, but now artificial silk is largely used for this purpose.

CRIPPLE. A cripple is a person who suffers from lameness due to some weakness or deformity of the feet or legs. The defect may be primarily in the limbs, or be due to head or spinal injuries or diseases. Some form of apparatus, and in some cases operation, may relieve the condition. *See* Artificial Limbs; Club Foot; Crutch; Deformity.

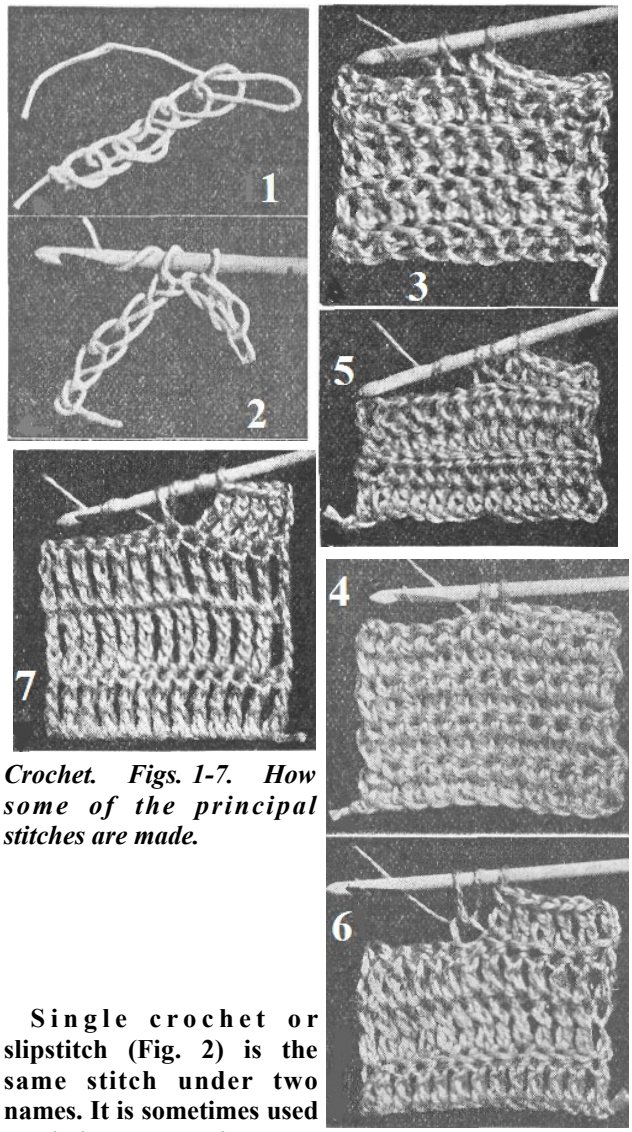
CROCHET WORK: IN VARIED STYLES

Simple, Double, Filet and Picot Stitches Described

For the application of this work readers should consult such entries as Luncheon Set; Tablecloth. Associated articles are Bead; Embroidery; Lace. See also Bell Gauge

First known as Shepherd's Knitting, crochet derives its name from the French word croc, meaning hook, as it is performed with a hook of steel for fine work and bone for coarser work. The first stitch is chain-stitch, generally given in directions as the foundation chain, and all crochet work must have a foundation chain.

The first loop is made with the fingers, thus: Hold the end of the thread with the thumb and forefinger of the left hand, and with the right hand pass the main thread over the end to form a loop, holding both down under the left thumb. Insert the crochet hook from right to left through this loop, and draw the thread through. Draw the loop up close, when the first chain will be made. *Pass the thread round the hook, and draw it through the chain-stitch on the hook, then repeat from * for succession of chain-stitches, Fig. 1.



Crochet. Figs. 1-7. How some of the principal stitches are made.

Single crochet or slipstitch (Fig. 2) is the same stitch under two names. It is sometimes used to join one stitch to another, such as at the end of a round, when the last stitch is slipstitched to the first to join; sometimes it is employed to get from one position to another without breaking off the cotton and restarting. To make this stitch, simply put the hook in the stitch and draw the cotton through the stitch and the loop on the hook in one action.

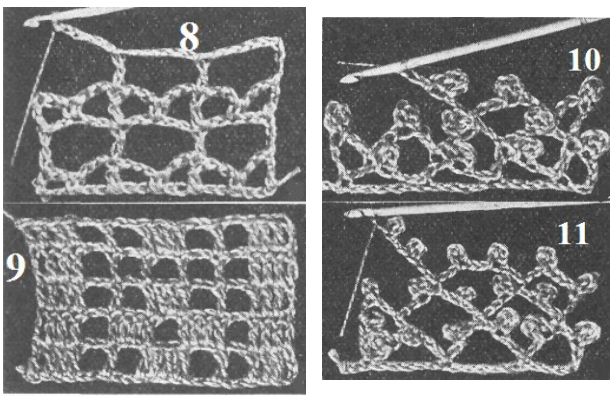
This stitch is employed in every form of crochet, from the finest Irish lace (where it forms a length of chain into a picot) to big garments. When working the

latter in rounds instead of rows, a slipstitch joins the last stitch to the first.

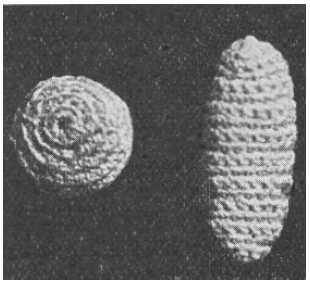
Double Crochet. Double crochet is a very useful stitch, and there are two varieties, ribbed and flat, both worked in the same manner, but the hook is placed differently at the be-ginning. For ribbed double crochet (Fig. 3) put the hook in the back loop of the two seen at the top of the stitch after working one row (in the first row it just goes through the chain), cotton over hook, and draw through the stitch, making another loop on the hook, cotton over, and draw through two loops, completing one double crochet. For flat double crochet take up both the loops seen at the top of the stitch, and work as just described (Fig. 4).

Short treble is shown in Fig. 5. First put the thread round the hook, then hook in one of the foundation chains, thread over hook and draw through. There will now be three loops on the hook; thread over, and draw through all the loops on the hook at once. When this stitch is worked in rows, always put the hook in the loop at the back of the stitch, when there will be a chain stitch running along the surface of the ridges.

Treble stitch (Fig. 6) is worked in two varieties, ribbed and flat. To work ribbed treble, put wool over hook, hook in stitch, and draw the wool through, wool over hook, and draw through two stitches, wool over again, and draw through the last two stitches. There will be two loops at the top of this stitch; and in ribbed treble the hook is put under the back loop. For flat treble put the hook through both loops at the top of the stitch, as shown in Fig. 4 for flat double crochet.



Crochet. Fig. 8. How to make laoets and bars.
Fig. 9. Filet crochet.
Figs. 10 and 11. Single and double picot stitch



Crochet buttons made according to instructions given in this article.

Double treble (Fig. 7) is similar to treble, but the cotton is put twice round the hook at the beginning, then all the loops worked off by twos. Sometimes long treble is obtained when the cotton is taken round the hook three and four times, but the number is generally given in the directions.

Lacets and bars (Fig. 8) are used chiefly to form a background. Sometimes there is a row of lacets, then a row of bars, each bar spanning over a lacet. A lacet is 3 chain, miss 2 stitches, 1 double crochet in next stitch, 3 chain, miss 2 stitches, 1 treble in next stitch. A bar is 5 chain, miss 5 stitches, 1 treble on next stitch. When it spans over a lacet it is necessary to miss the 3 chain, 1 double crochet, and 3 chain, and put the treble on the treble at end of lacet. Lacets and bars are often used alternately along the row forming a pretty background.

Filet Crochet. Filet crochet (Fig. 9) consists of groups of trebles and open spaces. The spaces are made thus: * 2 chain, miss 2 stitches, 1 treble on the next stitch, and repeat from * for as many spaces as required. Where a group of treble is given, 1 treble is put into each stitch consecutively along the row, whether that stitch be a chain or treble, and these groups form the solid part of the design, the spaces being the background.

Note that the treble finishing the last space before a group is not counted in the group of trebles, because it is already counted in the last space, and if counted twice the symmetry of the design is spoiled. The actual number of trebles should be divisible by 3, besides the one at beginning of the group which finishes the last space or lacet, as the case may be.

When working the first row of filet crochet, the first treble is put into the 8th chain from hook to form the first space, this making 2 chain for the foundation, 3 chain for the treble, and 2 chain for the top of the space. If the work has a treble border, than the row is turned with 3 chain, and this stands for the first treble of the following row. The treble over which this chain stands is not worked into, and when the end of a row is reached always work the last stitch into the top of the 3 chain which is at beginning of previous row. If there is a space at end of row instead, then work into the third chain. When there are directions in brackets, this portion is always worked the number of times stated immediately after the brackets. Take note of the word worked not repeated. The brackets show which part to repeat.

Picot (Fig. 10) is a little loop of chain-stitches formed into a ring with a slipstitch, and forms the background of Irish crochet. It usually consists of 5 chain, and a slipstitch into the 5th chain from the hook to form a picot. A single picot loop is made thus: 7 chain, slipstitch into 9th chain from hook, 2 chain, then 1 double crochet on the foundation to fasten down the picot loop. A double picot loop has 2 picots of 5 chain with 2 chain after each.

Two forms of crochet buttons are shown in the illustration. The materials required for making the barrel button are some ordinary crochet cotton (No. 24) and a No. 5 hook.

Begin with 14 chain stitches, work first row thus: Miss one chain, do 1 double crochet into next 13 chain, turn with one chain. For the 2nd row, work 1 double

crochet in each stitch to end, but do not work into the one turning chain. The 3rd row consists of 2 double crochet in the first stitch, and 1 double crochet in each of the next 12 stitches. For the 4th row do 2 double crochet in the first stitch, and 1 double crochet in each of the next 13 stitches, and make the 5th row 1 double crochet in each of first 4 double crochet, 2 double crochet in next stitch, 1 double crochet in each of four more stitches, 2 double crochet in the next double crochet, and 1 double crochet in each of the last five double crochet. The 6th and 7th rows consist of 1 double crochet in each stitch, while the 8th and 9th rows represent 2 double crochet in first stitch, and 1 double crochet in each stitch to end.

The 10th row should be •* 1 double crochet in each of five double crochet, 2 double crochet in sixth stitch; then repeat from * once, and work 1 double crochet in each remaining stitch. Let the llth row consist of 1 double crochet in each stitch, and for the 12th row do * 6 double crochet, miss the seventh; then repeat from * once and work 1 double crochet in each stitch to end. For the 13th and 14th rows, miss first stitch, 1 double crochet in each stitch to end. For the 15th and 16th rows work 1 double crochet in each stitch and work the 17th row as follows: * 4 double crochet, miss next stitch, then repeat from * once, and make 1 double crochet in each stitch, to end. Work the 18th and 19th rows by missing the first stitch and making 1 double crochet in each stitch to end. 20th and 21st should be done in the same way as the 15th and 16th rows. Fasten off. First and last rows form ends of button and these are sewn up, drawing up the middle a little to round it. Sew about three-quarters of the way on the long side (which forms under part of button) then stuff with cotton-wool and sew up the remainder.

The materials required for the barrel button may also be used for the ball button. To make this, begin with 5 chain stitches, and form these into a ring by slipstitching to the first stitch. For the 1st round do 12 double crochet into the ring, and for the second, work * 2 double crochet into the first stitch, 1 double crochet into next, and then repeat from * all round. 3rd: * 2 double into first stitch, 1 double into each of next 2. Repeat from * all round. 4th: 1st stitch similar, 1 double into each of next 3 stitches. Repeat. 5th: 1 double into each 6th round, * miss first stitch, work *l double crochet into each of next 4 double crochet, then repeat all round. 7th: As 5th. 8th: * Miss first stitch, 1 double crochet into each of next 3. Repeat. 9th: * Miss first, do 1 double into each of next 2 stitches. Repeat all round. 10th: * Miss first, do 1 double into next. Repeat, llth: as 10th. Fill the button with cotton-wool. Break off thread, pass into a needle, draw up and fasten off very securely.

The Crochet Hook. It is advisable to buy well-made hooks, as any roughness in steel or bone may destroy the texture of fine silk or wool. The blade, throat, and hook parts should all be made in one piece in bone crochet hooks and the throat part should be of even thickness.

Steel hooks run in sizes 00, 0, 1, 1½, mounting in ½ sizes up to 8. No. 00 up to 1 are often used for the finer makes of wool and for artificial silk instead of bone. The finer sizes, 6½ to 8, are only used for very fine Irish crochet, while No. 8 is chiefly used for catching the thread in real Carrickmacross lace. Bone crochet hooks are numbered 1 to 12; 1 and 2 are seldom used except for very coarse rug making. A No. 12 bone is employed with very fine Shetland wool.

CROCK. The name is applied to varieties of earthenware jars or pans glazed inside and sometimes outside. The Sussex crock is used for storage of butter, dripping, stock, etc., in the larder. A bread crock is an earthenware pan having a separate cover or lid of the same material.



Crock. Typical glazed earthenware crock, suitable for larder use.

The advantage of earthenware lies in the facility with which it can be cleansed, its comparative immunity from absorption, and the absence of rusting. *See* Bread Pan: Earthen-ware.

CROCKERY: Its Repair. It is always easier to repair crockery if the job is taken in hand at once, as the fracture is then quite clean. There are various methods, but the simplest is to stick the parts together with one or other of the numerous patent adhesives on the market.

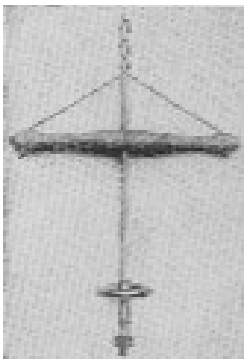
The usual method employed is to coat the edges with the adhesive and press the parts together, holding them in contact while the glue sets, or blocking them up, or strapping the parts together with bands of linen or paper, which are subsequently removed when the cement has set firm.

This method will generally keep the parts in contact, although it seldom results in a thoroughly satisfactory job. Either the joints give when the article is put into service, or the thin film of glue becomes conspicuous by the coating of dust that always accumulates along the line of fracture.

When restoring a valued piece that has broken into many fragments, patience must be exercised and only two pieces joined together at a time, allowing the joints to set hard before attempting to complete the whole piece of work. If a few tiny parts are missing they can often be moulded in fine plaster of Paris made into a cement with liquid glue and just sufficient warm water to make the material into a workable paste. When thoroughly dry it can be smoothed with sandpaper, and coloured to match the original work.

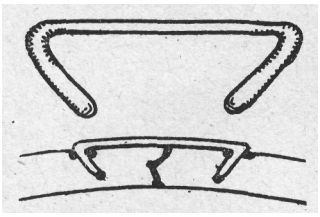
The Use of Rivets. The most effective way of re-

pairing crockery so that it can be put into everyday use is by riveting. For this purpose a drill stock specially devised for such work is indispensable, and the general appearance is shown in Fig. 1. Such drills are made with a diamond point, and are far more effective than using a hard steel drill and diamond dust or carborundum as an abrasive. To use the drill, the spindle is twisted so that the cord is wound round the stem; when the crossbar is pressed downwards the cord untwists and rotates the drill. The hand is then raised quickly and the momentum of the drill again winds the cord around the stem, so that by regular and repeated movements of the crossbar the drill can be kept in motion. The drill is worked with the right hand, while the left hand holds the piece of crockery.

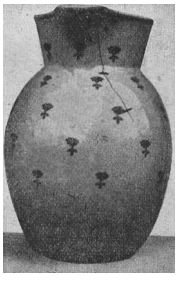


Crockery. Fig. 1. Drill stock employed for making rivet holes in crockery and china (Courtesy of R. Melhuish & Co., Ltd.)

Commence by moistening the drill point with oil, and then drill a slanting hole downwards into the china and about ¼ in. away from the edge of the fracture. The rivets are simply bent to shape from soft brass wire about 1/16 in. diameter, a pair of flat-nosed pliers being handy for this work. The shape of the rivet when made is shown in Fig. 2. Some judgement is needed in placing the rivets so that the fewest number accomplish the required result. On plates and dishes the rivets are best applied to the back, where they are out of sight, but on a jug with a broken spout there is little chance to do more than in-sert some of the rivets on the inside and the remainder on the outside.



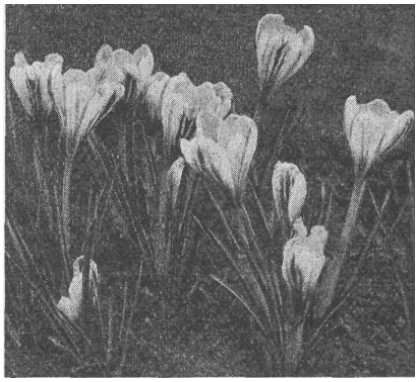
Crockery. Fig. 2. Diagrams illustrating a china rivet bent for use and the method by which it is inserted in the drilled holes.



Crockery. Fig. 3. Bedroom ewer with side and lip mended with rivets.

To insert a rivet, take care to flatten the inner sur-face of the wire a little so that it bears more effectively on the china, and see that the legs are not too long; they should not quite reach the bottom of the hole, otherwise they will never be flat on the surface of the china. When all is in order the rivet is bedded into the holes with a little plaster of Paris made into a paste with water and a trace of glue. A typical repair is shown in Fig. 3.

CROCUS. There are three classes of crocus—spring, autumn and winter flowering: all are hardy. The crocus root is technically known as a corm. Spring crocuses are planted in August or September, 2 in. deep; they look best in grass and flourish beneath large, leaf-losing trees. They also do well in beds and borders, and may be left undisturbed indefinitely. There are several handsome large-flowered named varieties, e.g. Sir Walter Scott, Mont Blanc, King of the Blues. These are worth growing in flower-pots for the greenhouse.



Crocus. Group of spring-flowering crocus, white veined with purple.

The corms of autumn and winter flowering crocuses are planted in July and August; they are usually planted in the rock garden among low-growing tufted plants which prevent the blooms being spoilt by soil splashed up in wet weather. They make charming plants for the unheated greenhouse if grown in pots: this is really the best way to grow the winter crocuses. Of those that bloom in autumn some of the best are:

Asturieus, lilac-mauve; hadriaticus, white; pulchellus, lavender-blue; sativus, violet; and speciosus, lavender-blue. Some of the chief winter-flowering crocuses are chrysanthus, yellow; Imperati, pale with purple stripes; Sieberi, pale purple, and tommasinianus, pale lavender.

CROQUET AND THE CROQUET LAWN

The Rules of an Attractive Outdoor Game

Other articles on outdoor games played in the home garden which appear in this Encyclopedia are Badminton; Bowls; Clock Golf; Lawn Tennis

This outdoor game for four players can be played on any level lawn that is of sufficient dimensions. The standard size is 35 yd. in length by 28 yd. in width, but a lesser space can be utilised, provided its length and breadth are in the proportion of 5 to 4. The boundaries are marked with white lines.

The implements required are mallets, one for each player, and four balls that are coloured red, black, blue, and yellow, the mallets being usually marked on the handles to correspond. The balls should be 3⅝ in. in diameter, and weigh about 16 oz,, 16¼ being the maximum. Stuck into the ground are six hoops and two posts. Each hoop should stand 12 in. out of the ground and be not more than 4 in. in width across the inside.

Each of the four outer hoops are 7 yd. from the side boundary and 7 from the end of the ground nearest to them. The centre hoops are 7 yd. from each other and 14 from the boundaries on either side. The posts or pegs are in line with the centre hoops, each being 7 yd. from the boundary, and in line across the ground with the side hoops. The posts should be 18 in. high and 1½ in. in diameter.

Sometimes, however, the game is played on a ground set out somewhat differently on a plan known as No. 2 or Willis setting. In this there is only one peg, not two, this being placed in the centre of the ground with the central hoops each 7 yd. from it in a line parallel with the side hoops.

The game is played by two players in partnership against the other two. The pair using the blue and black balls always play those using the red and yellow ones. A game consists in making the balls traverse the course twice, once in each direction, and the pair who finish first win, i.e. both must finish before the second of their opponents does so. All the hoops must be passed through in regular order once on the outward and once on the homeward journey, and the posts must be struck by the balls once each, one when the player is half way round and the other for the finish, The posts may be hit from any direction, but the hoops can only be passed through from the front. The players play in turn, each following an opponent. The usual order is blue, red, black, yellow. The game can also be played by two persons, one against the other. In that case each takes two balls, playing them alternately, as would be the case if there were four players.

Such is the older and popular way of playing croquet, but many play according to rules introduced in 1914. The "either ball" law provides that, as regards the single game, when it is the turn of a player to play, he may play with either ball, blue or black, or red or yellow, as the case may be. In doubles, either player may play the turn. Under another law, passed in 1923, the partners succeed each other in playing any turn after each point is made.

The game is started from balk, i.e. a space behind the first hoop on the left-hand side of the ground. The two hoops in front of him must be taken by each player in turn, after which he crosses the ground and takes the two on the other side, but in the reverse order to the first two. He then makes for one and then the other of the centre hoops, after which he strikes the turning peg, which is at the end of the ground farthest away from balk, with the ball.

The reverse journey is then begun. The two hoops he took first are again taken, but in the other direction, as are the two on the other side of the ground. He then goes to the centre, and this time, leaving the turning peg, passes in turn through the two hoops and finally drives his ball against the winning peg, which is the one near the balk. If, in hitting, a player drives an opponent's ball through the hoop which that player has next to negotiate, the stroke counts, and when his turn comes the opponent plays for the next one. A player can also drive a partner's ball through a hoop, the score counting if the hoop is the next in order of play.

The game begins with the first player driving off from balk. If he succeeds in passing his ball through the first hoop he has another shot and can continue playing until he fails to score a hoop. The game, however, can hardly begin in earnest until all the balls are played, so we will assume this has been done. The first player then plays again. He can either drive his ball through a hoop or hit one of the other balls with it. In either case, provided with the subsequent croquet stroke neither his own ball nor the ball from which croquet is being taken has been driven out of the ground, he is allowed another stroke.

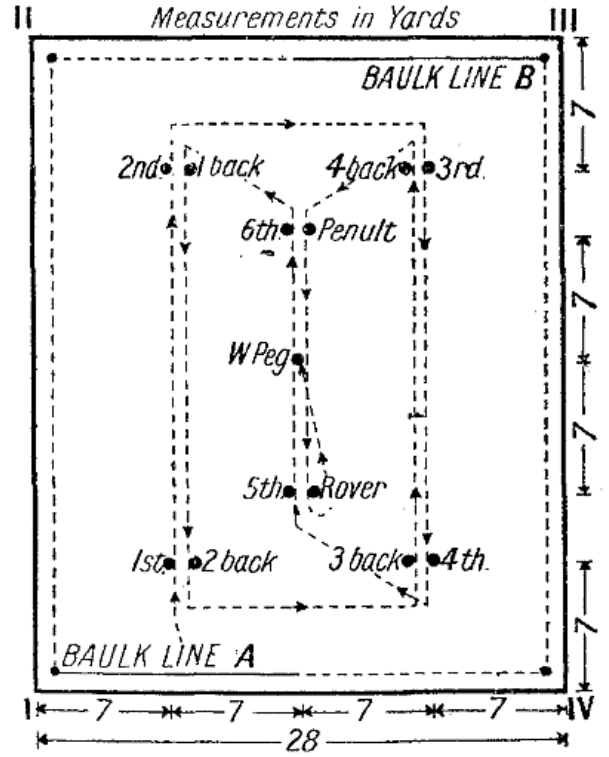
If he has hit another ball this stroke must take the form of a croquet. To croquet he places his own ball against the one he has struck, and hits the former. Having thus moved both, he can play his ball again and again drive it through a hoop or hit another ball with it, and he can continue this as long as he is successful, with the important proviso that he must not croquet off the same ball twice, unless in the meantime the player has passed his own ball through a hoop next in order or scored a peg.

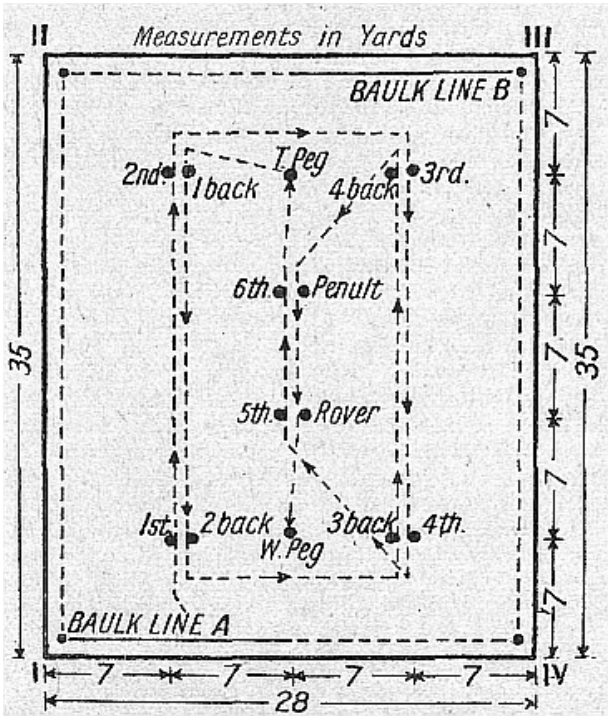
The object of the game is therefore very much as in billiards, to use the other balls as means of scoring, and to be careful to finish with one's opponents' balls, especially that of the opponent who will play next, in disadvantageous positions. This is far more important than an extra score. Formerly this was often done by wiring the ball of the opponent who plays next, i.e. leaving it lying close against a hoop on the side away from the three other balls, the hoop being thus between the next player and his objective. This made a good shot almost impossible. Early in the 20th century an alteration was made in the laws, and now a player whose ball is wired can remove it and play from balk, provided it was put there by an adversary.

Mallets and Balls. Croquet mallets consist of two parts, the shaft and the head. For the shaft, hickory is a useful and popular wood, but some are made of malacca cane, and a few of ash and elm. The heads are made of boxwood or lignum vitae, the former having the advantage of being less brittle than the latter. Many mallets are furnished with grips to prevent the hands from slipping. These may be formed by binding the shaft with string, or fitting it with cork or rubber. Of these, cork is perhaps the best, although, like rubber, it lessens slightly the force of the stroke.

In other mallets the player relies for his grip upon the shape of the handle. Such may be octagonal, or oval, or round. The octagonal, with grooves down the side, is for most players the most satisfactory. The oval handle is unsuitable for centre play, and the round one cannot be recommended. The choice of a mallet depends very much upon the style of play adopted. For side play a light implement is desirable, but for centre play a heavier one. The former should not weigh more than 3 lb.; the latter may well weigh ½ lb. more. The length of the shaft should be about 33 in. The head, should measure 9 in. and have a diameter of 3 in.

But whatever the style, a mallet should answer to the following requirements. It must be well balanced and the shaft must be straight. The hole in which the shaft fits into the head must be accurately bored, and the shaft must be set into the head with the grain of the wood at right angles to the head.





Croquet. Positions of hoops and course of play in the two methods of playing the game.

Formerly croquet balls were made of wood, and were, therefore, liable to chip, but they are now made of composition, and are thus free from that defect.

Where handicapping is carried out in croquet tournaments, it is done by means of bisques, i.e. extra turns which a player can take at the conclusion of his ordinary turn. The weakest players are handicapped at 14 bisques and the strongest at—3.

The game is controlled by the Croquet Association, 4, Southampton Row, London, W.C., and under its rules tournaments are held all over the country throughout the summer. The croquet open championships are played at Roehampton, near London, every year in July.

CROQUETTE. Scraps of meat, fish or poultry can be utilised to advantage in making croquettes, being minced and blended with various flavourings and some rich thick sauce. A little cooked ham or bacon is always a satisfactory addition. Should the meat be very dark, egg and crumb the croquettes twice.

To use the remains of a cold chicken, remove the skin and bone and chop up enough of the flesh to make ¾ lb. Melt 2 oz. of butter in a saucepan over the fire, stir in 1 oz. of flour, and then add ½ pint of chicken stock or milk. Stir this sauce over a slow heat until it thickens, then let it cool slightly before adding the chicken, ¼ lb. of cooked and chopped ham, and a teaspoonful of grated lemon rind.

Mix all well, season the mixture carefully with salt, pepper, and nutmeg, and if it is too dry add a little more stock or milk. Turn the whole on to a plate, let it cool, and then mark it into even-sized divisions, forming each into a neat shape. Roll the croquettes in flour, brush them over with beaten egg, and cover them with breadcrumbs. Put 4 oz, of fat in a frying-pan over the fire, and when a blue smoke rises from it put in the croquettes, two or three at a time, and fry them a golden brown. Drain them on paper, and serve garnished with fried parsley. *See* Crab.

CROSSBANDING. In furniture design this is a method of using veneered strips at the outer boundaries of the panels. It is done so that the grain runs at right angles to the constructional edges.

CROSS CUT SAW. This type of saw is employed for cutting across a log or large piece of timber, or for similar heavy work.

The one-man cross cut saw is adapted for single-handed use, although both hands are generally needed to push the saw. They are made from 3 ft. to 5 ft. in length, and most have a supplementary handle that can be bolted to the end of the saw blade, and are then usable by two men. The two-man cross cut saw is only usable by two operators, each grasping an end of the saw and working in unison. Such saws are made from 4 ft. to 7 ft. in length; the handles are either bolted to the saw blade or fixed into sockets riveted to the ends of the blade.

The tooth shape varies according to the nature of the

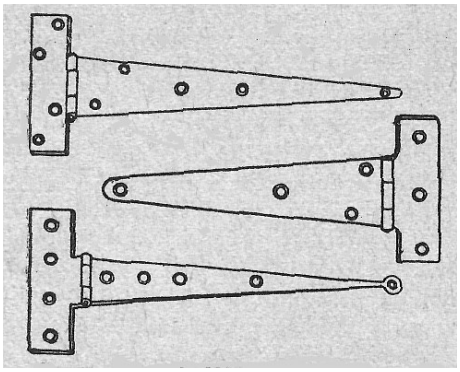
work, but for general use the great American type of tooth is the best, advantages being that the set can be put on the small or peg teeth; the deep slots give freedom for the chips, and prevent troubles which would otherwise be caused by local distortion of the blade.



Cross Cut Saw. How a two-man cross cut saw is used for cutting tree trunks.

The teeth are sharpened and set in the usual way. In using such saws a regular, steady stroke is essential, about 20 to 25 strokes per minute being all that is needed. When not in use wipe the blade with a greasy rag, and hang the saw up so that the blade does not get bent or twisted. *See* Saw.

CROSS-EYE. This is a condition of squint or strabismus, in which both eyes are not focussed on the point looked at. If something small is held in front of the patient's eyes, say, at about 18 in., it may be readily seen that the gaze of one eye is not directed towards the object. If it is difficult to determine whether this is so or not, a piece of paper should be placed in front of the eye which appears to be looking straight at the object, and the other eye may then be observed to swing into its correct position. The condition may be due to paralysis or weakness of one or more of the muscles which move the eyeball, or it may result from over-action of a muscle when some error of refraction is present. *See* Eye; Spectacles; Squint.

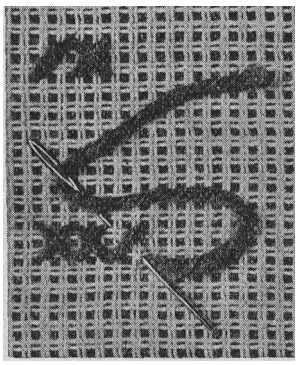


Cross Garnet Hinge. Patterns of this door hinge in common use.

CROSS GARNET HINGE. These are extensively used for the commoner variety of doors both indoors and for external work. The ordinary type is made from pressed steel, japanned black, and from 6 in. to 24 in. long. The T-shaped end is screwed to the upright, the long part to the door. Cross garnets are easy to hang, as they are generally screwed on flush with the door and the post. The Lancashire cross garnet type is a superior quality made of wrought iron with a wrought eye at the extremity; they are preferable for heavier doors. Best heavy Lancashire cross garnets are desirable for doors such as those on a garage or stable. They are made from 12 in. to 24 in. long. The 12 in. weigh about 2 ¼ lb. per pair, the 24 in. about 10 lb. per pair.

In hanging a door on ordinary cross garnets always fix the hinges to the doorpost first, block up the door so that it is tight up against the lintel, then fix the straps of the hinge to the door. On removing the blocks the door will drop slightly on the hinges, and it will then swing properly. *See* Hinge.

CROSS STITCH. Lending itself equally well to embroidery on house linen, children's garments, samplers and chair seats, many decorative and useful articles are patterned in cross stitch or completely covered by this work in cotton, silk, or wool. The double stitch employed is formed by two oblique stitches, placed one across the other and crossing each other in the centre. The top stitches in a row must always lie the same way. In the illustration more than one mesh of canvas is used to enlarge the stitch. When embroidering on linen, muslin, etc., a transfer pattern marks the stitches, or the design may be carefully drawn with a pencil.



Cross Stitch. Position of needle in making the stitch.

If coarse material be used the threads can be counted, and the cross stitches worked directly on the material; if not, an auxiliary canvas may be used. This should be sewn securely in position over the material; and the pattern worked into the ground material through the canvas, the threads of the latter acting as a guide to the right position only, as they are afterwards pulled away, leaving the completed design behind. Sufficient margin of the canvas must be left so that the threads can be drawn out easily afterwards.

This is useful when borders of simple design are worked on cushions, or for cross stitch embroidery on silk bags and pochettes.

When solid cross stitch is worked for chair seats or stool coverings, etc., the geometrical or floral design is usually worked in colours, so that it forms a contrast with the background stitches. This also applies to figure designs which can be worked by means of a transfer ironed on the canvas in the ordinary way. Canvas can be obtained on which the design is traced. *See* Calendar; Canvas; Sampler.

CROTON OIL. One of the most active cathartics (purgatives) used in medicine is croton oil. Usually given ½ to 1 drop on a lump of sugar, or in a little pat of butter, croton oil is chiefly used in cases of sudden unconsciousness, paralytic stroke, etc., where it is important to clear out the bowels without delay. The butter is placed on the back of the tongue. Internally

the drug should only be used under the direction of the doctor.

CROUCH WARE. This term properly pertains to the early kinds of salt-glaze stoneware made in Staffordshire. The oldest is a drab or buff fabric, but about 1720 crisp, white salt-glaze pottery was produced, and that is the style of Crouch ware which is usually collected. Being mixed with Derbyshire pipeclay, its paste was dense and well finished, at first greenish, but afterwards whiter. Salt-glaze is essentially English, and looks particularly pleasing when it is contrasted with old brass-ware of plain English design. *See* Pottery.



Crouch Ware. Characteristic bowl in salt-glaze ware, with applied ornamentation, c. 1720.

CROUP. The chief symptom of this ailment of childhood is the peculiar hoarse trumpeting cough and difficulty in breathing. Inflammation of the larynx and trachea is attended by more or less swelling of their lining mucous membrane, and the narrowing of the air passage may be sufficient to produce a croupy cough. In false croup, however, there is a spasm of the vocal cords in addition, and the result is the onset of such difficulty of breathing.

The child may spring up in bed, the attack usually occurring at night. In drawing in the breath the child may make a crowing noise. Suffocation may appear to be imminent. This may go on for an hour or two, and then the child drops into a restless sleep. Next day there is still hoarseness, but otherwise comfort may not be much interfered with. In the night there may be another seizure, but not so severe, and after a few days recovery may be complete.

Frequently there is a tendency to the recurrence of croup. To prevent this the child's throat should be examined, and if the tonsils are enlarged and adenoids present these should be removed. Further, the child should be warmly clad, with flannel underclothing, and should not be allowed to sleep in damp rooms or be exposed to cold winds. The onset of a croupy cough should be brought to the notice of the doctor.

True or membranous croup, in which a membrane forms on and about the vocal cords, may be due to scalding from hot liquids or steam, or to swallowing corrosive poisons; but it is usually due to a micro-organism, in most cases the diphtheria bacillus. Certainly, apart from the scalding cases, one should always treat the case on the assumption of its being diphtheria. In this form the crowing on breathing in may precede the dyspnoea, which usually comes on gradually, though at any time it is liable suddenly to become urgent. On the occurrence of crowing the doctor should be summoned.

In spasmodic croup, or Laryngismus stridulus, which is most common during the first two years of life and is associated with rickets, the child suddenly stops breathing and the face becomes purple. Then suddenly the child succeeds in drawing in the breath, making a peculiar crowing sound. Sometimes there is only the holding of the breath without the crowing. These infants are also liable to convulsions. Recovery is usual.

Treatment consists of trying in every way to build up the general health of the child. Any irregularities of diet should be seen to, constipation should be remedied, and if rickets is present the disease should be actively treated. Should attacks follow close upon one another, place the child in a hot bath and sponge the head and neck at the same time with cold water. *See* Bronchitis Kettle; Child; Rickets.

CROUSTADE. For a savoury, small entrée or breakfast dish, croustades of fried bread are a nice way of serving cheese and egg mixtures, tomatoes, sardines, anchovy and egg, or savoury minces. To make, cut circles of stale bread, each about ½ in. thick and 3 in. in diameter. Mark out an inner circle with a smaller-sized cutter and fry the circles in hot dripping. Take them out of the pan and drain them carefully, then remove the inner ring of bread. The croustades can be then filled with the savoury mixture. *See* Curry.

CROÛTON. These thinly cut pieces of bread, variously shaped and fried in hot fat, are used for garnishing such dishes as mince, hash, ragoûts, and savoury dishes of cheese, etc., or cut into dice as an accompaniment to thick soups. When cutting croutons the crusts, which can be used for puddings, are removed. When served as a base for a savoury croûtons are usually termed croûtes.

Crowfoot. This is an old English name for the genus ranunculus or buttercup.

CROWING: In Children. It is mostly in rickety children that the ailment known as crowing occurs, a peculiar spasm in which the child suddenly has great difficulty in drawing its breath, and makes a croaking noise. Frequently there is a liability to convulsions. The mother will often tell the doctor that the crowing begins whenever the child is crossed or excited in any way; or it may follow on waking up or being exposed to a cold draught.

For treatment sponges wrung out of hot water should be placed over the throat, and the chin should be drawn forward. If the child becomes pale and ceases to make any effort to breathe, artificial respiration (q.v.) should be carried out, the child being placed on a rug on the floor for the purpose. Between the attacks the state of the digestion should be looked to.

To begin with, give ¼ to ½ teaspoonful of confection of senna or a dose of castor oil. The physician may order bromides. If convulsions occur the child should be put in a warm bath. To prevent a return of the condition the general health should be built up, by giving the child more outdoor exercise and plenty of nourishing food, with a fair supply of fats. A teaspoonful or more of some emulsion of cod liver oil,

taken three times a day after meals, is useful. *See* Croup.

The crowing of a cock may constitute a legal nuisance. *See* Animals.

CROWN DERBY. It is usual to regard the period of about 30 years after 1784 as pre-eminently the Crown Derby period.

Crown Derby includes the best undecorated biscuit ware ever made in England, comprising rustic and classical figures and groups, besides statuettes of British generals and admirals. Crown Derby Japan shows imitations of Eastern designs. The French sprig or Chantilly pattern, usually a blue corn-flower, sometimes edged with gold, is prized.



Crown Derby. Beautiful vase made from a classical model, 17 in. high.

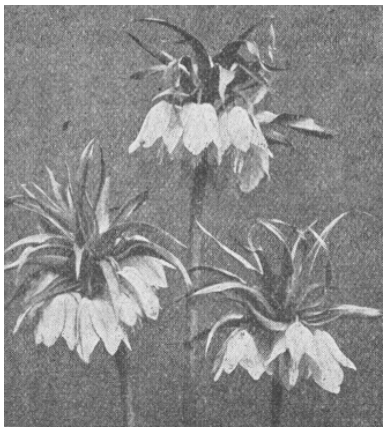
For many lovers of page of old china Crown Derby means the well-known painted and gilded ware, either seen in pieces of elaborate design with decorated pedestals and sometimes with lids and handles, or in the form of dinner and dessert services; also in tall, square-based vases, enriched with blue, canary yellow, pink, or apple-green grounds, and delicate landscape scenes. The modern ware, started in 1877 and styled Royal since 1890, includes reproductions of the characteristic decoration of the old models. *See* China.

CROWN GALL. The swellings or galls termed crown gall occur on a great variety of herbaceous and woody plants. The effects of crown gall are seen in dwarfing of growth or direct injury to roots or branches.

It has been shown that the bacteria invade the plant through wounds, and that in all probability they cannot enter an uninjured surface. The greatest care, therefore, should be exercised in not injuring the stocks more than is necessary.

The removal of a gall from a plant does not necessarily free the plant from the disease. The bacteria, in certain plants in any case, spread in the tissues by means of the tumour strands, and, if the gall is merely cut off, the disease may break out again later. On the other hand, if a deeper wound is made with the object of cutting out the whole infected area, it may injure or even kill the tree. If the galls are on the lateral roots and only a few are attacked the affected roots should be cut out, but if badly galled the trees should be burned. This information is given by the Ministry of Agriculture in Leaflet No. 253.

CROWN IMPERIAL (Fritillaria imperialis). This hardy bulb in spring bears clusters of drooping bell-shaped flowers on the top of a stem about 2 ½ ft. high. The blooms are of various colours, yellow, orange, and reddish. Bulbs should be planted 6 in. deep in early autumn and left undisturbed, for they become established slowly. This plant likes deep, loamy soil, and does not mind slight shade.



Crown Imperial, a handsome, hardy, spring flowering bulb.

CRUELTY. Whether practised on human beings or on animals, cruelty is an offence against English law. Persons can be prosecuted and punished if they starve or otherwise ill-treat children, while dogs, horses, and cats are likewise protected. To ensure conviction a specific act of cruelty, as defined by law, must be proved before a magistrate. Persons who suspect others of acts of cruelty should, in the case of children, inform the National Society for the Prevention of Cruelty to Children, 15, Leicester Square, London, W.C.; and, in the case of animals, the Royal Society for the Prevention of Cruelty to Animals, 105, Jermyn Street, London, S.W. There is a Scottish society at 19, Melville Street, Edinburgh. *See* Animals; Child.

CRUMB. Originally a small particle of anything, this word is chiefly used for small, loose particles of bread. It is also used for the soft part of the loaf as opposed to the crust. *See* Bread; Breadcrumbs.

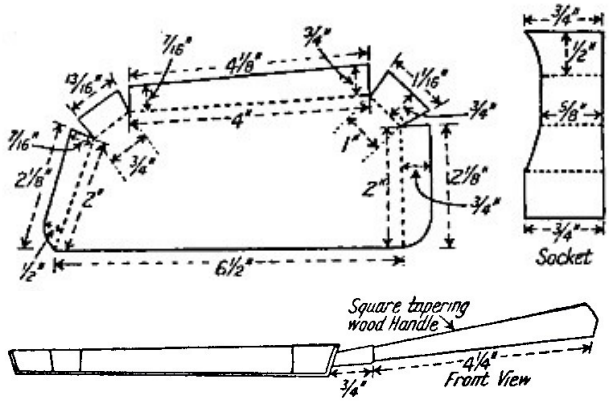
Crumb Brush. The cheap brushes made in plain or curved shapes for sweeping up crumbs from the table after meals are composed of fibre, horsehair (drafts), or mixings (bristles). The better qualities, with all bristle knots, drawn into the stocks with wire, will last a lifetime, but in present day households the brush and tray have rather given place to the scoop, which combines both in use. *See* Brush.

Crumb Scoop. The design given for a crumb scoop is purposely simple, and intended for easy construction, in any desired metal about 1/32 in. thick. Copper or brass is convenient, as the joints are readily soldered.

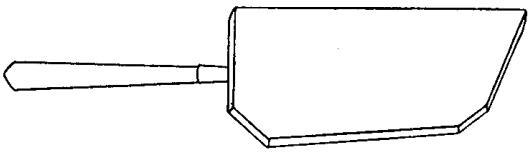
The scoop is made by cutting a sheet of the metal to the shape given in the drawings, hammering the rim to shape on a block of hardwood. A raw hide hammer is desirable, as it does not bruise the metal. After bending, the joints must be silver soldered and thoroughly cleaned and scraped. The handle socket is bent to shape round a block of iron, then silver soldered at the joint and to the crumb scoop.

The handle is cut from hardwood, fitted to the socket, and secured with a fine pin driven in after the final polishing and lacquering. The handle should be

dyed black and wax polished. The final treatment may be by electro-plating and buffing, or by simple lacquering.



Crumb Scoop. Diagrams showing how to make a simple scoop.



CRUMPET. If yeast is to be used, dissolve 1 oz. of it in a pint of lukewarm water to which a pinch of salt has been added. Stir in sufficient flour to make a light, smooth batter, then cover it and leave it for an hour to rise. Beat the batter, leave it for about 20 min., beat it again, and pour it into greased crumpet rings placed on a baking sheet. It must be cooked well on both sides.

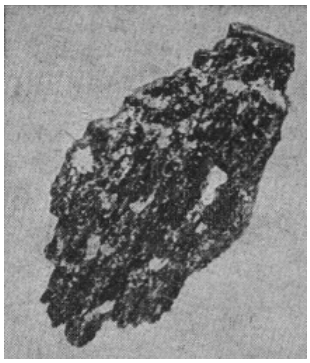
To make crumpets without yeast, use 3 eggs to 1 lb. of self-raising flour and a teacupful of milk. Stir a dessertspoonful of sugar into the flour, and make a hollow in the centre. Mix the eggs with the milk, and lightly stir these into the flour, working the whole up as quickly as possible into a light dough. Then roll it out and cut it into circles each about ½ in; thick. Prick these with a fork and cook them on a girdle or in the oven until they are firm and light brown in colour. Serve them toasted on both sides and buttered.

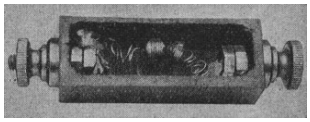
CRUTCH. A crutch is a staff which may be single throughout or bifurcated for part of the distance, with a concave headpiece to take the weight of the body at the armpit. It should be as light as is consistent with strength. Pressure of the head of a crutch on the nerves in the armpit may bring on paralysis of the upper limb, crutch paralysis, the commonest result being wrist-drop (q.v.), though the whole arm may be affected. A cross-piece for the hands, taking some weight off the armpit, helps to avoid this, also a spring support at the top. A modified crutch may be used which only reaches as high as the middle of the upper arm, which it grips by a horse-shoe metal band. There is a cross-piece for the hand, which takes the weight.

In emergency, a crutch can be extemporised by wrapping the head of a broom in a clean piece of cloth. *See* Artificial Limbs; Cripple.

CRYSTAL. Although this word is used to describe glass ware of a fine quality, real crystal is hardly ever made into vases or other ornamental and useful household articles, as it would be too costly. It is chiefly seen decoratively in the form of cut bead necklaces and has many uses in the manufacture of eye glasses lenses for binoculars, and cameras, etc. In the case of large cut glass or crystal ornaments, it is advisable to have small rubber or cork disks cemented on the base to prevent damage when the article is placed on a hard surface. Cut crystal beads may be distinguished from glass imitations by touching one with the lips. Real crystal will remain almost icy cold, whilst glass will quickly become warm when held in the hands and tested against the lips. *See* Glass.

CRYSTAL DETECTOR. Certain kinds of mineral ore, when placed in contact with certain metals or other minerals, act as rectifiers or detectors of high-frequency oscillations. The crystal although still used in simple wireless receivers, has been largely superseded by the valve detector which is more sensitive and stable. Zincite and bornite, galena or silicon and brass, carborundum and steel are sensitive combinations, but careful adjustment of the contact pressure is necessary to ensure maximum results. Carborundum is robust, but has the disadvantage of requiring a small battery and potentiometer. *See* Detector.





Crystal Detector. Permanent type showing crystals held in contact by springs; surrounding wax has been removed. Left, crystal of carborundum.

CRYSTALLIZED FRUIT. Cherries, slices of orange green figs and greengages, small apricots, and lemon, chunks of pineapple, and melon may be crystallized or candied by the following method:

First make a strong syrup by dissolving 1 lb. loaf sugar in ½ pint water. Then boil it with the lid off the pan, and without stirring it, or the syrup granulates. When it has boiled for about 10 min., or reaches 245° on the sugar thermometer, test the syrup by dropping a little of it into very cold water and taking out the little lump that forms. Roll it up in the fingers and see if it will form a firm ball. If so, take the pan off the fire, add a teaspoonful of lemon juice and put the pan over another one containing boiling water to keep the syrup from candying too soon.

Take the prepared fruits up on the point of a fine skewer, or a coarse needle, and immerse each piece in the syrup. Lift them out and drain off the excess of

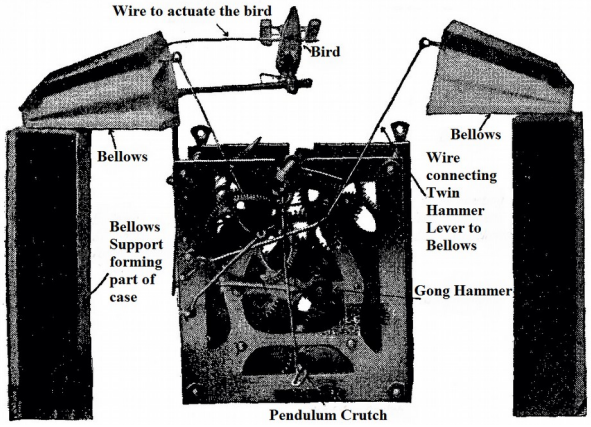
syrup by laying them on lightly oiled or buttered trays, and dry them off in a warm, dry place. Cherries should be stoned before dipping, and oranges should be peeled and divided into sections without breaking the inner skin, as all fruits must be perfectly dry.

CUBIC MEASURE. This is used for measuring volume or capacity. It is as follows: 1,728 cubic in.=l cubic ft., 27 cubic ft.= 1 cubic yard.

CUCKOO CLOCK. In the wood-frame cuckoo clock a mechanical toy bird imitates at each hour the sound of the cuckoo, or a hammer strikes the hours on a gong and the bird merely emphasises the time. It is actuated by weights suspended on chains. The pendulum is sometimes hung on a wire loop, which requires frequent oiling.

The striking mechanism has two hammer arbors resembling the ting-tang device in a clock that strikes the quarters. As the hour strikes, the two hammer arbors lift up small bellows in the clock by means of rods. The bellows fall one after the other, and give a puff of wind to a pipe or reed which produces the cuckoo note. The bird is frequently made with a jointed head or beak interconnected with the bellows, and so arranged that the bird makes a movement simultaneously with the sound.

The bellows may sometimes fail, due to a leakage, which can be repaired by re-covering the bellows, or occasionally by sticking a patch over the hole. The connecting wires may be damaged or displaced, but this defect is easily remedied, either by replacing with a new part or by restoring the piece. *See* Clock.



Cuckoo Clock. Mechanism of the clock, with connexions for striking the gong, working the bellows and making the bird start from its door.

Cuckoo Flower. The popular name of Cardamine pratensis, or Lady's Smock (q.v.)

Cuckoo Pint. One of the popular names of the wild Arum maculatum, which is known also as Lords and Ladies and Wake Robin.

CUCKOO SPIT. The presence of frothy, spittle-like masses on many plants in the garden is quite common in summer. If the froth is blown aside, a thick, bull-headed, greenish insect is revealed. It is the so-called cuckoo-spit or frog-hopper (Aphrophora spumaria). It is not very injurious unless present in large quantities, which is unusual. A vigorous syringing with paraffin emulsion will get rid of it.

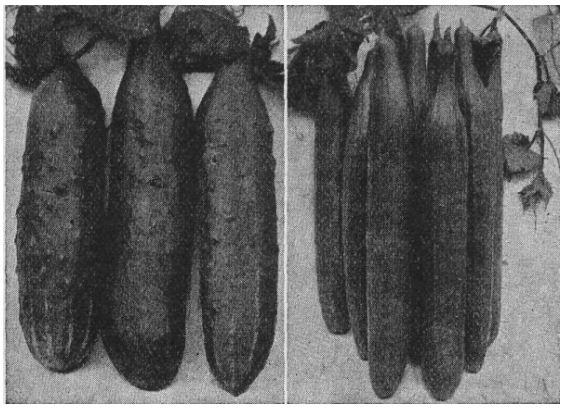
CUCUMBERS: THE SEVERAL VARIETIES Growing the Vegetable and Preparing it for the Table

This article describes the cultivation, whether in the open air or in frames, of the vegetable, and gives recipes for serving it. See also Frame; Kitchen Garden

Although cucumbers can be raised in the open air, the results are rarely satisfactory, and they are almost invariably produced under glass in Great Britain. The plant is an annual with creeping stems and tendrils, rough heart-shaped leaves, and yellow flowers of two kinds, male and female, the latter producing the fruit.

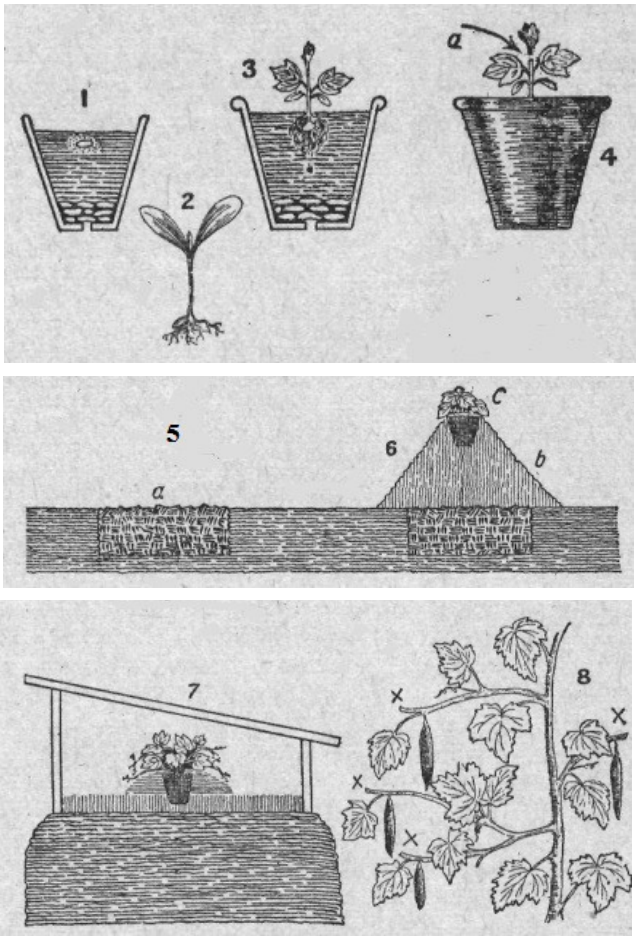
As it is convenient to have the young plants in separate pots, each seed may be sown in a 3 in. pot with a compost well enriched with leaf-mould. In a warm house or manure-heated pit or frame with a temperature of 60° or upwards the seed will soon germinate. The soil must never be allowed to get dry, nor must the atmosphere be permitted to get arid. The plants may be planted out when 6 in. high, but, except in frame culture, it is usual to transfer them to 5 in. pots and to grow them on.

It is a good plan, when planting, to set them on mounds of lumpy soil. When taken out of the pots they should be planted with the ball of soil and roots entire, taking care not to bury the ball very deeply. As the roots show through fresh soil must be added. A flower stake supports them in the mound until they reach the wires, which should be stretched beneath the glass of the house at a distance of about 1 ft. from it. Once on the wires the plants will make rapid progress. The main shoots should be trained thinly on the wires, but the side shoots should be "stopped."



Cucumber. Lelt, short, rough-skinned variety, grown in the open air. Right, specimens raised under glass; they are double the length of the outdoor ones.

Cucumbers require a warm, saturated atmosphere, which can be maintained by syringing the vines and the surfaces of the house once or twice a day. Water should be used to keep the mounds moist and tepid. When the plants are in full bearing applications of liquid manure twice a week will increase the yield and size of the fruit. Good varieties are Everyday, Delicacy, Improved Telegraph and Bochford Market.



Cucumber. Diagrams illustrating the culture of the plant. 1. How seed is embedded in sand and sown in loamy soil. 2. Seedling. 3. Stage when ready for repotting. 4. Pinching out, as at a. 5 and 6. Outdoor growing, a, hole filled with manure; b, ridge of soil above manure; c, plant. 7. How to plant in frame. 8. Points of laterals pinched out at X.

Several fungoid diseases attack the cucumber. If the bed of soil is watered excessively, a stem gangrene called canker commonly starts. The soil should be drawn away and lime or sulphur rubbed in.

Cucumbers are often affected by a malady induced by the root-knot eelworm. The first symptom of attack is a drooping and yellowing of the foliage, followed by the stem becoming limp, and a collapse of the entire plant. To destroy these eelworms the soil must be thoroughly saturated three times, at intervals of a fortnight, with a solution of one part of cresylic, or liquid carbolic acid, in 40 parts of water. The plants that are ruined by the eelworms should be burnt.

Cucumbers in Frames. It is quite practicable to grow excellent cucumbers in an ordinary frame, provided the hotbed has been properly prepared, and steady bottom heat maintained. Inside the frame there should be mounds of soil consisting of loam and leaf-mould, one plant being placed in each mound. The roots must be covered with fresh compost from time to time. Planting is done in April and May. One plant will fill a frame 6 ft. by 4 ft.

Ridge cucumbers can be grown out of doors in summer by putting out the plants in May in rich soil; in a cold, wet season they are liable to fail. Suitable varieties are King of the Ridge and Stockwood, and the gherkin for pickling purposes.

How to Cook. Cucumbers may be treated in most of the ways suitable for marrows and aubergines, but are most popular in salads, when they are peeled and very thinly sliced. Thin slices of cucumber are also served with cold salmon. When used as an accompaniment to cold meat, they are usually covered with vinegar, and served in a glass dish. If they are to be eaten raw, cucumbers should be young and firm, and free from seeds.

Stewed cucumber, served with sauce made from the stock in which it was boiled, makes a good dinner vegetable. To prepare it, peel 2 cucumbers, cut them lengthways into quarters, and, if they are old, remove the seeds. Place the pieces in boiling salted water, simmering them there until they are tender ; then drain and heat them in a sauce prepared from 1 oz. of margarine, a little cucumber stock, 1 oz. flour, 1 tablespoonful unsweetened condensed milk, and two tablespoonfuls cow's milk.

Melt the margarine, add the flour,, and blend the two ingredients well. Pour in the milk gradually, with 5 or 6 tablespoonfuls of stock, stir the whole in a pan over the fire until it boils, and then simmer it for 5 minutes. Lastly, add the condensed milk and the cucumber, heat up the whole, and serve the cucumber with the sauce poured over it.

Cucumber Cassolettes. A good way of using up half a cucumber which has been left over from salad making is to peel it thinly, cut it int6 4 pieces, and carefully scoop out the centre of each. Stew these very gently until they are tender, in ½ pint of milk and water, mixed in any proportions, then take them out of the pan and flake ½ lb. cold salmon or other cooked fish. Season the flakes well, and stuff them into the hollow pieces of cucumber. Thicken the liquor the cucumber was stewed in with ½ oz. cornflour or barley-flour mixed with a little milk, add 2 teaspoonfuls of chopped parsley, and then pour in a little hot water in which has been melted 2 sheets of gelatine. Add a squeeze of lemon juice, and pour the sauce over the cucumber cassolettes, coating them neatly, and garnishing them with cold peas. Serve cold with potato salad.

A similar dish is prepared by cutting a large

cucumber into rounds each about 2 in. thick, peeling these thinly, and scooping out the insides till a thickness of only ½ in. is left. Put the rounds into boiling water with a little salt and castor sugar, boil them until tender, and then leave them to cool. When cold, fill them with a mixture composed of peas and some carrots and turnips scooped out about the size of a pea. Before being used for filling the vegetables should be boiled, and when cold mixed with mayonnaise sauce to which some whipped cream has been added.

Cumin. The plant of this name, which is brought from the Levant, contains an aromatic oil and acts as a carminative (q.v).

CUP: The Drinking Vessel. One of the oldest of drinking vessels, the cup has taken a number of forms, some of these being known by special names, such as flagon, goblet, loving cup and tankard. Many of these were made by English silversmiths in the 17th and 18th centuries.

Tumbler cups, so-called because they are shaped like a tumbler and are without handles, are found in silver and in Sheffield plate. One example of the time of Charles II is embossed with flowers and foliage. A variant of this cup, known as a taster, is fitted with a handle, and is shallower than the tumbler form. Another variety is the wine cup, which stands on a stem and a foot.

Cups with saucers to match are made in a number of shapes and sizes, but can be divided into three main categories—breakfast, tea, and coffee cups. Most breakfast cups hold about ½ pint, while teacups hold roughly a gill. They are generally flatter and wider-mouthed than either breakfast or coffee cups, but should not be chosen too wide, as the wider and shallower the cup the sooner the tea will cool. Cups for black coffee usually hold only 2 tablespoonfuls. Special cups for invalids are made with a spout, and with the top partially covered in to prevent the contents from spilling. *See* Breakfast; China; Coffee; Crockery.

CUP. This is a kind of drink, made usually from claret or the lighter white wines mixed with soda water, sweetened, and with various herbs and flavourings added. Recipes will be found under the headings of suitable beverages. *See* Cider Cup; Claret Cup; Hock Cup.

CUPBOARDS AND THEIR CONSTRUCTION
Decorative and Useful Pieces Described and Illustrated

Other entries similar in scope are those dealing with Bureau; Wardrobe, etc. See also Corner Cupboard and the articles on Amateur Carpentry; Cabinet Making; Drawing. Other forms of cupboard are shown under Bachelor Flat; Bedroom; Bookcase, etc.

The oldest existing cupboards date from the reign of Elizabeth. The original cupboard, known as a court or livery cupboard, was the equivalent of the modern sideboard or buffet. Such cupboards were used to assist the service of meals, and many were elaborately carved, the lower part being simply a chest, which opened by means of two doors.

Cupboards are divided into two kinds, those built into the house and those that are movable. The built-in cupboard was used in the Queen Anne period for the display of china and pottery. It had fitted shelves and sometimes doors; it was either a corner fixture or built in each side of the chimney breast. This idea is adapted by modern architects for suitable houses, and by decorators in treating corners and recesses in rooms and halls which lend themselves to a Queen Anne or Georgian style of furnishing.

Built-in cupboards increase in importance with space and labour-saving exigencies. Linen cupboards, geyser cupboards, fixture cupboards that shut off sinks, baths, wash-stands and dressing tables in bachelor flats and bed sitting rooms; airing cupboards which make home laundry possible in the small flat, and dining room cupboards painted or panelled to fit in with the decorative scheme and made to contain all the table equipment, dessert, etc., and ingredients for drinks, are cleverly introduced into recesses or form an integral part of the architect's plans for small houses.

With the exception ot the corner cupboard, decorative movable cupboards are not much seen to-day. They tend to become severely practical, but are exceedingly useful to supplement landlord's fixtures when the tenancy of a flat or house is only for three years or so. The illustration of a modern dining room cupboard gives a useful idea for the furnishing of a recess in a small room.



Cupboard. Beautiful old oak Court cupboard. It is of the Elizabethan period and is elaborately carved and inlaid. (Courtesy of M. Harris & Sons)

A Hanging Cupboard. A useful and easily made cupboard, designed either as a hanging cupboard or for shelves, is shown in Fig. 1. The ends are 1 in. deal, the full height of the job and 1 in. less in width (i.e. 15 in.), the odd inch being taken up by the pilasters fixed on the face of the carcass. These are the same thickness as the door, so that the whole front will line up. The ends, dovetailed to take the top (Fig. 3), are grooved near the bottom (Fig. 4), and the bottom shaping cut to form the feet, as seen in Figs. 1 and 2. A rebate is run at the inside edge in which the back fits, this measuring ½ in. or ⅜ in. for the panels.

CUPBOARD

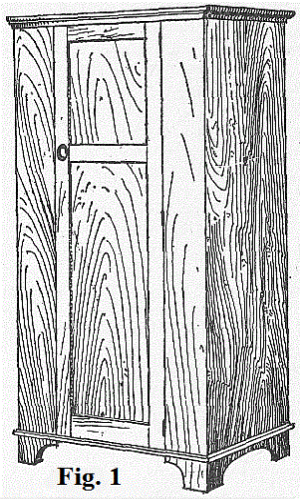
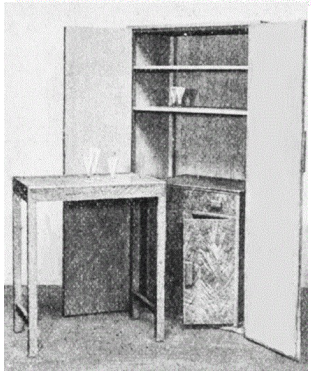


Fig. 1

Figs. 1-4. Useful hanging cupboard, with details of its construction.

The top and bottom are both the full width of the job, less the thickness of the back panels; they are cut away at the front ends to take the pilasters, and will thus be flush with the front edge of the ends. The top, 3 ft. in length, is through dovetailed, the ends of the dovetails being hidden by the cornice moulding. The length of the bottom will be the inside distance between the ends, plus twice the depth of the groove in the ends. The carcass should be glued up using nails to strengthen the groove joint and corner blocks, as indicated in the diagram at Fig. 4.



Left. Cupboard. Dining room cupboard in oak with portable table on ball castors for service. The table stands inside the cupboard. (Courtesy of Waring & Gillow, Ltd.)

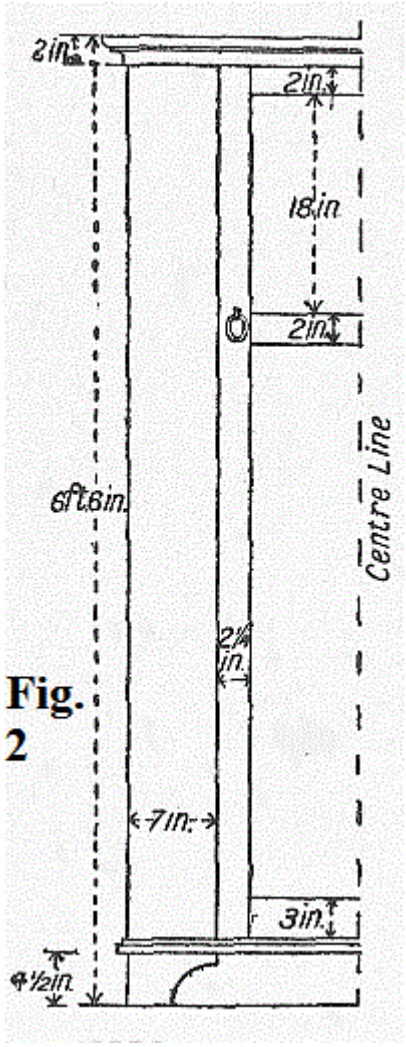


Fig. 2

When dry, fix the back, which consists of three panels and two muntins, the latter being grooved to take the panels. Now true up the face of the job and fix the pilasters, these being previously cut to shape at the bottom. They are dowelled into the ends and screwed up top and bottom, the screws being hidden by the mouldings. A corner block, rubbed under the bottom between the pilasters and the ends, will strengthen the feet. Both mouldings should be mitred round, and glued and pinned. The door is mortised together with ½ in. grooved-in panels and hinged with three butts; a turn-buckle or screw-on lock may be used, with a stop fixed to the inside of the pilaster near the top to prevent the door from pushing in too far. Shelves or hooks may be fixed, the shelves being supported by square fillets screwed to the ends.

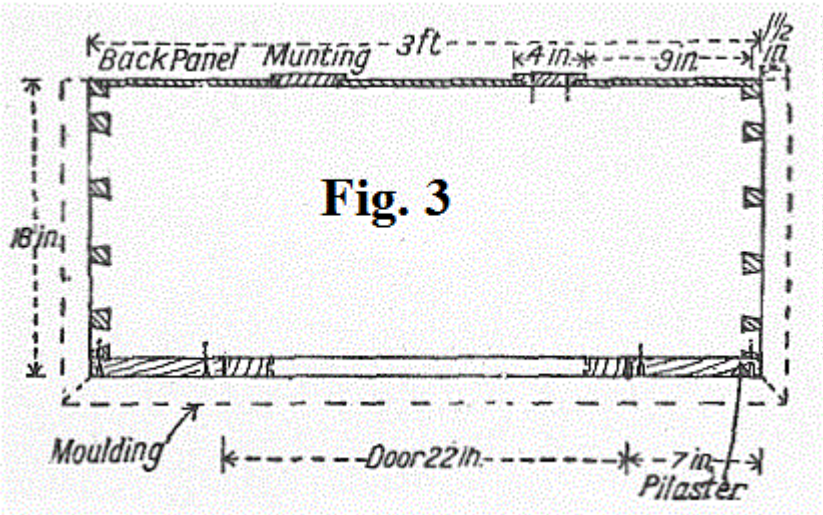


Fig. 3

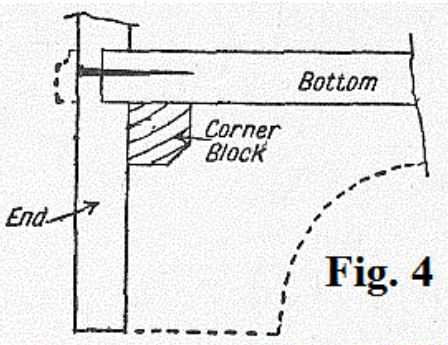


Fig. 4

CUPBOARD

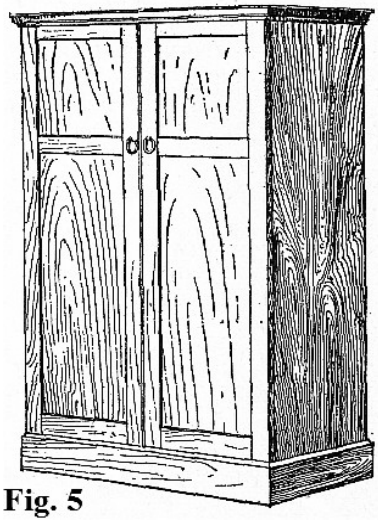


Fig. 5

Figs. 5-9. Kitchen or linen cupboard with elevation, plan and diagrams showing details of plinth and fitting of shelves.

Kitchen and Linen Cupboards. The kitchen cupboard, which is illustrated in Figs. 5-8, is a similar type of job to that shown in Fig. 1, except that the doors fit over the carcass and an applied plinth is used. The work proceeds as in Fig. 1, but the ends are cut off about 2½ in. short at the bottom (Fig. 8). This sketch also shows how the plinth is fixed with screws. A corner block should be rubbed at the inside of the mitre of the plinth. Three or four shelves are placed at convenient heights, supported by slips screwed to the ends.

A linen cupboard is of similar construction, except that, in place of shelves, a series of slats running from back to front are used to facilitate airing. Fig. 9 shows how these are constructed. Three rails measuring 3 in. by 1 in. are made to run from side to side, and to these rails the slats are screwed.

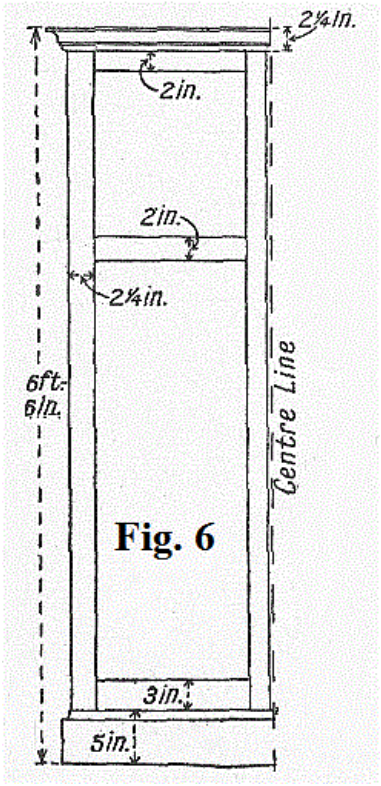


Fig. 6

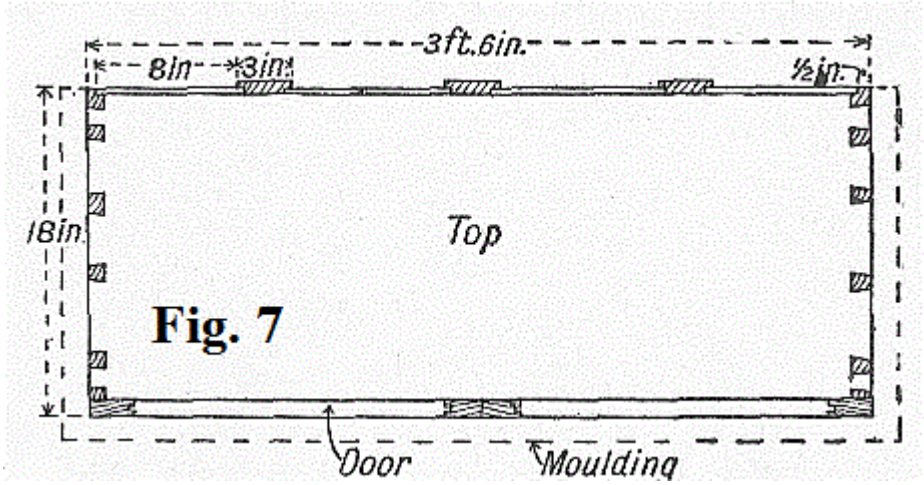


Fig. 7

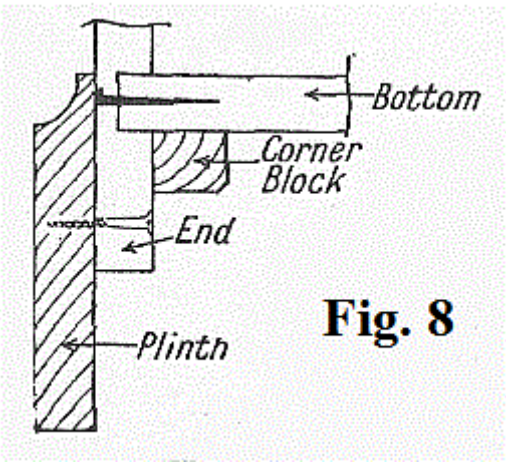


Fig. 8

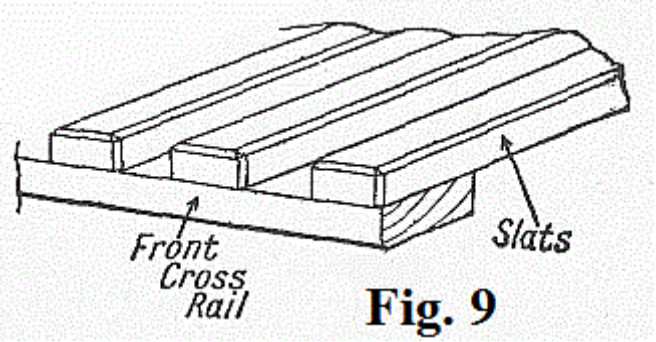
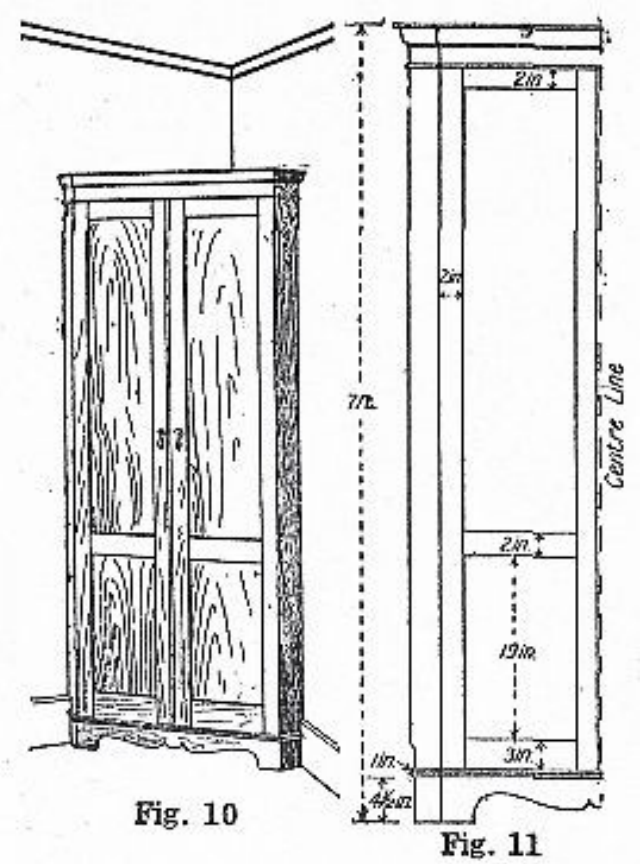


Fig. 9



Figs. 10-13. Corner cupboard for clothes, with diagrams of principal parts.

A Corner Cupboard. An example is shown in Fig. 10. The ends or backs do not fit up close to the wall, but stand away 1 in., thus allowing the pilasters to form a close fit to the walls. This is necessary in the case of the angle of the wall not being square, also to allow the pilasters to be scribed over the skirting.

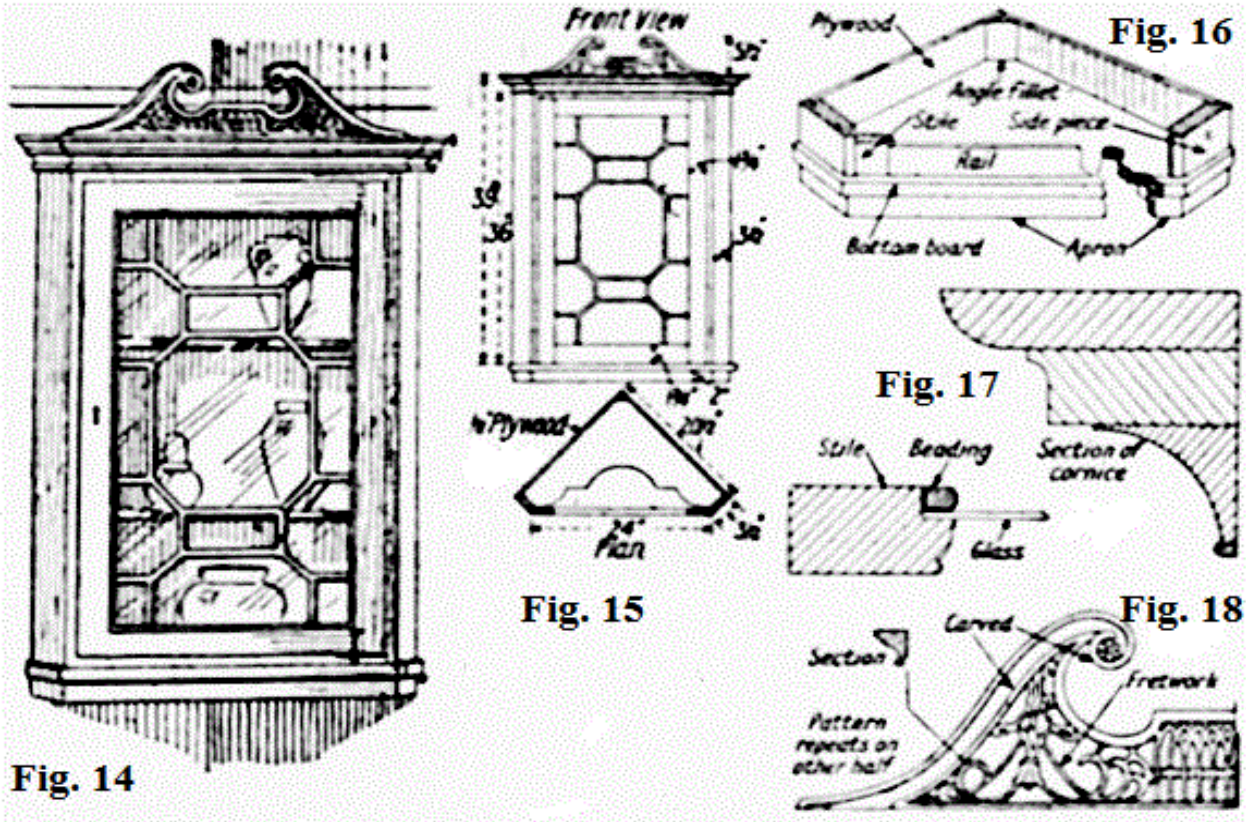
The top and bottom are first prepared. The top, dovetailed into the ends, as in Fig. 12, finishes at the front in a line with the inside of the doors, the frieze being fixed to this. The bottom is grooved into the backs, so that the size will be taken from the inside, adding the depth of the grooves; this also finishes to the inside of the doors. Having cut top and bottom to size, the width of the two backs is taken from them. These are ¾ in. deal, screwed together at the corner (Fig. 12). They occupy the full height of the job and are dovetailed and grooved. When glueing, screw the backs together first, then the top, and finally the bottom, which is nailed from the outside; corner blocks are rubbed underneath.

The pilasters are fixed to the edges of the ends with dowels; two screws may be put at the top and bottom hidden by the mouldings. The joint is also strengthened with corner blocks (Fig. 13). These pilasters are bevelled on the inner edges, to form a true mitre with the doors. The frieze to the top is screwed to the top, the top of the pilasters being cut, as in Fig. 13, to receive the ends The shaped plinth is secured in a similar way, putting corner blocks under the, bottom to strengthen it. The three mouldings, i.e. cornice, frieze and plinth, are mitred round, as indicated in Figs. 10 and 11, and fixed with glue and pins. The doors are framed together out of 1 in. stuff and have ½ in. grooved-in panels. The outer edges are bevelled at the same angle as the pilasters. A centre door stop is fixed behind the frieze, and screw-on bolts and locks used. Three 2½ in. butts are used for each door. To scribe the pilasters over the skirting, place the job close into the corner and set a pair of dividers to just the width of the opening left above the skirting. Using one point as a gauge, mark the pilasters with the other, drawing the dividers along the face of the skirting.

Hanging Chippendale Cupboard. Fig. 14 shows a form of hanging corner cupboard in the Chippendale style, all necessary dimensions being indicated in Fig. 15. Made in mahogany, it embodies the characteristic features of a swan-neck pediment with fretted panel, and a geometrical arrangement of glazing bars. The bottom board is rebated ¼ in. deep to take the sides and back pieces. The top board comes inside the side pieces, and the cornice moulding is planted on it. The pediment moulding is sawn to shape, carved and rebated to take the fretwork panel, the whole being glued and screwed in place. It is shown in detail in Fig. 18.

The stiles and rails, the sides and the bottom board are 1 in. thick. The apron beneath the bottom is of ½ in. stuff, mitred at corners and fixed with glue blocks. The ⅛ in. plywood back boards are nailed to top and bottom, and to rebates in side pieces. The construction is made clear by Fig. 16. A triangular fillet supports the plywood at the angle.

Details of the cornice and door framing are illustrated in Fig. 17. The door stiles extend from top to bottom of the opening, and the rails are tenoned to them. The glazing bars, shown in Fig. 15, are mitred at all joints, glued together, and planted on the glass. Shelves ¾ in. thick have curved fronts, and are glued and nailed to the plywood back. The cabinet, which should be lined inside with velvet, is suspended by four mirror-plates, screwed to the back edges of the top board.



Figs. 14-18. Mahogany hanging corner cupboard, Chippendale style, with details of construction.

A Recess Cupboard. A recess cupboard is shown in Fig. 19. As the walls of the recess form the back and sides, a framework must be erected at the front. Having decided upon the height, make a framework as in Fig. 20, consisting of a cross-piece tenoned into two uprights of 1¼ in. stuff, 4 in. wide. The cross piece is 6½ in. wide, the extra 2½ in. being allowed to take the cornice moulding, which is of this width. This frame is glued together, and when dry should be trued up to fit in position, the lower ends being scribed over the skirting. The fixing depends to a certain extent upon the interior accommodation required. For the example illustrated, a series of shelves, as in Fig. 21, is intended. Battens or bearers are fixed at each side of the recess, at equal heights, in the position required for the shelves; also for the top. These bearers, 2 in. by 1 in., are as long as the inside depth of the cupboard.

If the recess is of a good depth, allow the face of the frame to stand in sufficiently to permit the cornice moulding to butt into the sides of the recess. This obviates the necessity of making a return end to the moulding. The shelves and top are of 1 in. stuff, all of equal width, and are nailed down to the bearers. To these the frame is nailed, a series of nails being also driven in along the top. The nails should be punched in.

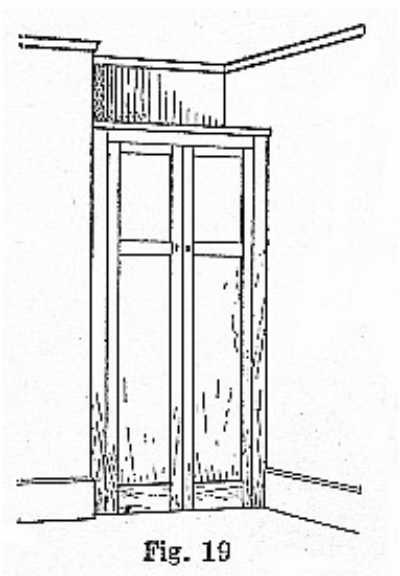


Fig. 19

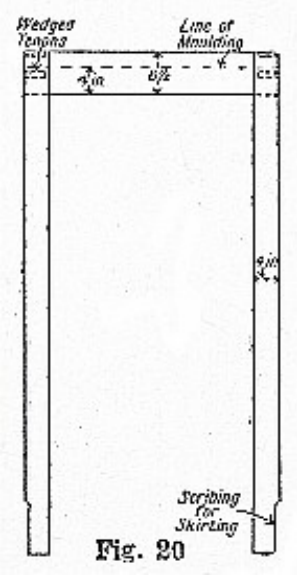


Fig. 20

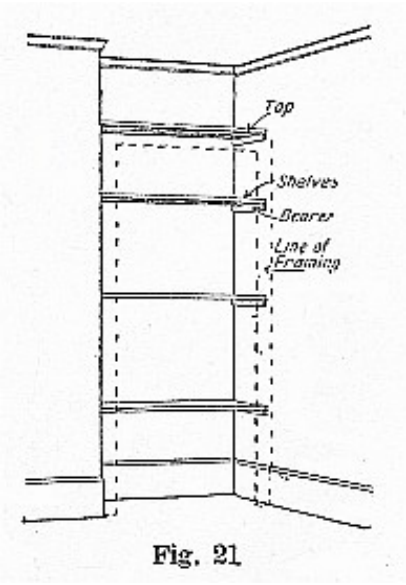
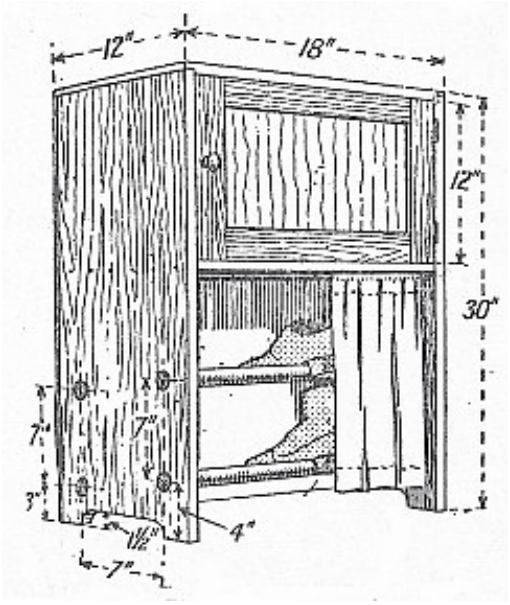


Fig. 21

Cupboard. Fig. 19. Bedroom recess cupboard. Fig. 20. Lintel and framework. Fig. 21. Interior, showing shelves supported by bearers secured to walls.



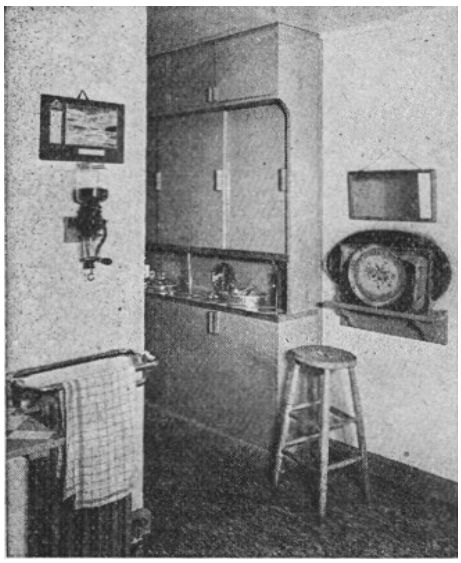
A Boot Cupboard. The boot cupboard for a bed-sitting room shown in Fig. 22 is. made with plywood about ½ in. thick. The top board is rebated at each end, and the side pieces fitted into them. The cupboard shelf is sawn to size, planed square on the ends, and glued and nailed between the side pieces. The whole of the back is then covered with ½ in. plywood, glued and nailed to the edges of the shelf, top and side pieces.

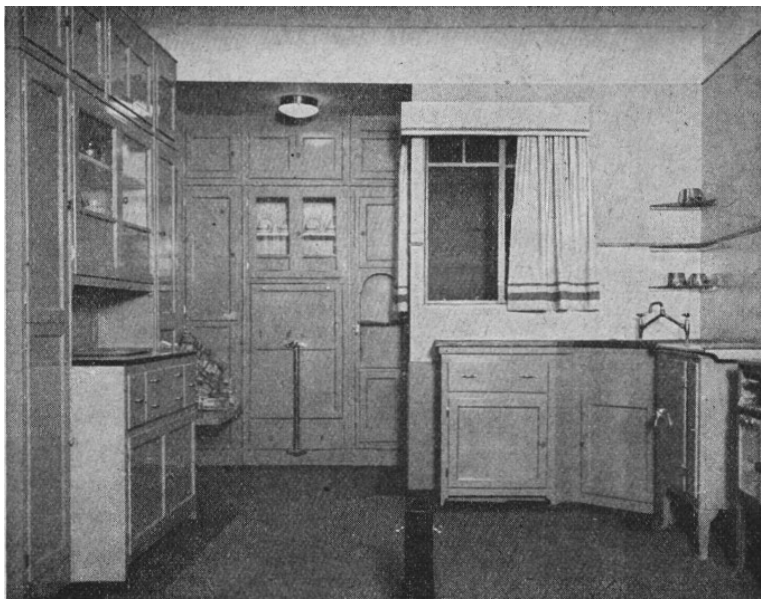
The boot racks are pieces of broom handle or similar round wood which fit into holes bored through the side pieces. The ends of the bars are rounded off, and all are glued into place. The cupboard door is made up with "cupboard door moulding," obtainable ready grooved and tenoned. The panel is a piece of 3/16 in. plywood. Hang the door on two small hinges, and fit a cupboard turn or lock. A curtain, fitted on a rod beneath the cupboard, conceals the boots and shoes. The cupboard can be finished by staining (and varnishing, or may be treated with a bright enamel.

Cupboard. Fig. 22. Compact arrangement for holding boots and shoes, useful for a bed-sitting room.

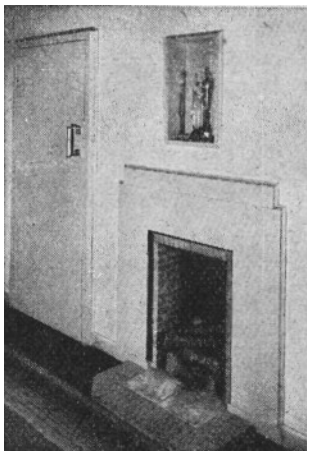
CUPBOARDS FOR ALL PURPOSES

Kitchens, Bedrooms & Linen Stores

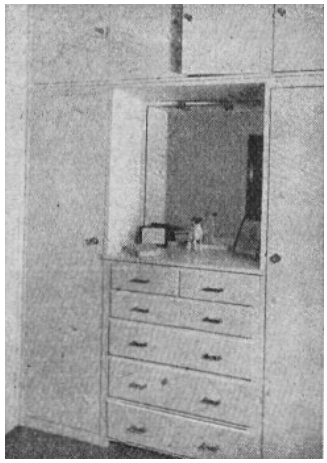


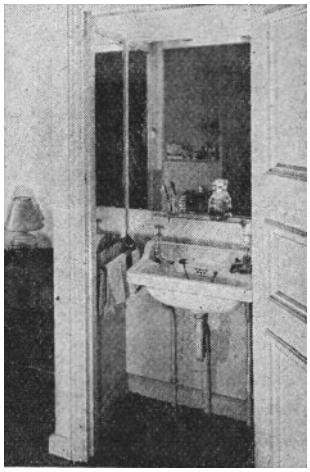


Two kitchen sets. Above, left: Everything is within easy reach; note the overhanging top row of cupboards, and middle shelves guarded by sliding doors. Right: Conventional hinge-doors on cupboards of all sizes, arranged with architectural economy in a kitchen where space is plentiful.

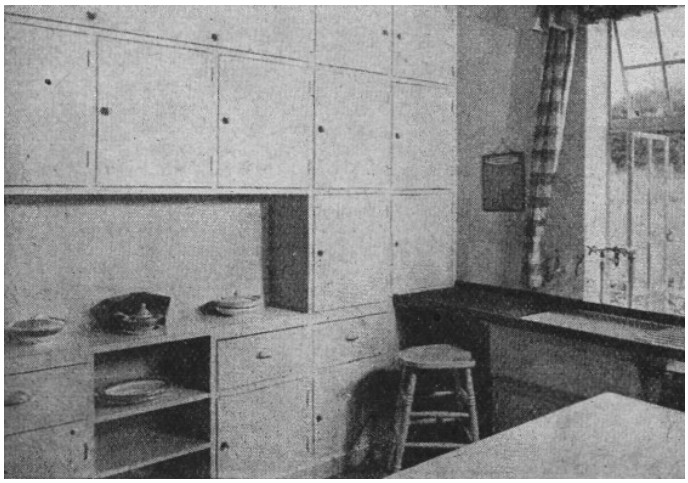




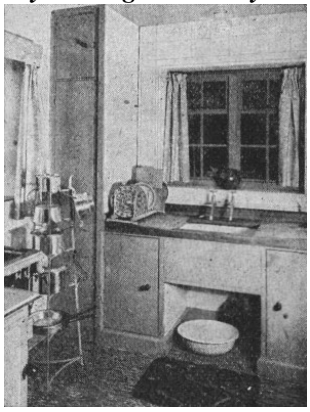




To the left : Cupboard door with lintel and chromium-steel pull-handle. Also an American linen-cupboard, with straps, etc., in orderly arrangement. Above: Bedroom set in white pine. Right: Cupboard-washstand, with mirrors, strip light, shelf and towel rail.



Left: Everything possible is built-in—shelves for saucepans, and plate racks. The space beneath the drainage boards ac-commodates kitchen stools and other things put out of the way. The right-hand lay -out, however, encloses all available space under the sink, but aims at having everything within easy reach.
(Photos, Lincoln Collins & Margaret Currant.)

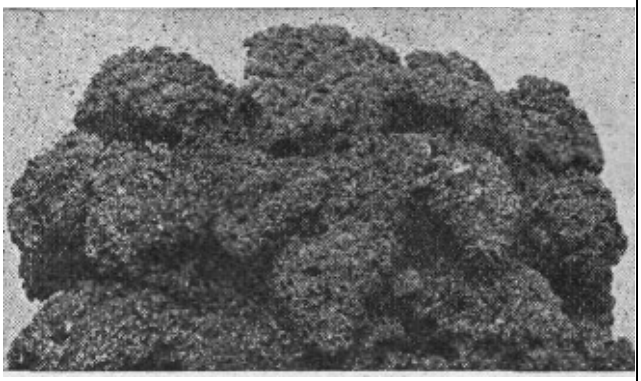


CURAÇAO. This liqueur is made from the peel of a very rare orange which grows in the island of Curaçao. It enters into the composition of many restoratives and tonics.

Curb. *See* Fender; Fireplace.

CURD. Curd is the nitrogenous part of milk, the solid substance left when the whey or liquid is separated. When milk sours, the curd coagulates by the action of the lactic acid formed in the milk. Cheese is made from the curd. *See* Cheese; Junket; Milk.

CURLY KALE. An indispensable hardy green winter vegetable. Seeds are sown on a prepared bed of fine soil out of doors in April, the seedlings are transplanted at about 6 in. apart to give them room to develop, and are put out in June or July 2 ft. apart where they are to remain. Curly kale is the name given to the Scotch or curled kale which has densely crisped or curled leaves. There are many other varieties of kale or borecole, e.g. asparagus, cottager's, sprouting, Drumhead and thousand-headed. Cottager's is an old and popular variety. In this the habit is upright and the leaves are plain. The central leaves are tinted blue or reddish purple. All these are useful winter vegetables and need the same treatment as curly kale.



Curly Kale. A favourite hardy winter vegetable with densely crisped or curled leaves.

How to Cook. To boil it, first wash and trim the kale, ridding it of any hard stalks, and then place it in a pan of boiling water, and boil it rapidly for 5 min. Then change the water for a similar quantity of fresh boiling water, adding a pinch of cooking soda and a teaspoonful of salt to every quart. When tender, drain off the water, press the kale well and chop it up, adding a lump of butter and a little salt and pepper, and mix all together, stirring them in the pan over the fire. Fill a hot vegetable dish with the kale, cutting it across several times with a knife.

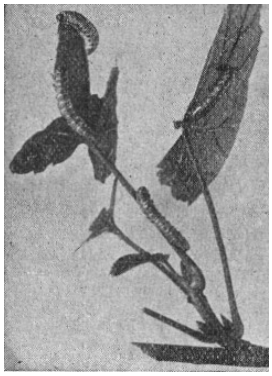
Curly kale may be cooked in a casserole. Wash it thoroughly in salted water, and then shred it coarsely and boil for 5 minutes before putting it into an earthenware casserole, together with a gill of water and a lump of fat about the size of a hen's egg; cover the pan and cook its contents gently, stirring them occasionally until the greens are tender. This should take about 1 hour. Finally, season it with pepper and salt and serve it in the casserole. *See* Broccoli; Kale.

CURRANT. Red and white currants will thrive in any soil that is not too heavy and damp, but black currants give of their best in a moist, heavy soil. The former bear fruit on spurs upon the old wood at the bottom of the previous year's growth. Black currants give their finest fruit on last year's wood, and therefore too much old wood should not be allowed.

Fresh currants of fine quality and quite ripe may be frosted, and in this form provide an attractive dessert dish. Prepare them by sieving some castor sugar on to a saucer or plate, and warming it without letting it melt. In the meantime, beat up the whites of 2 eggs and add to them 3 or 4 dessertspoonfuls of water. Divide ¾ lb. of currants into neat bunches, dip these into the egg mixture, and then into the castor sugar, making sure that they are well coated. Dry on a sheet of paper. *See* Black Currant; Red Currant; White Currant,

CURRANT: The Dried Fruit. Dried currants are a small variety of raisin imported from the Levant, and used in many cakes and puddings, and in mincemeat. They should not be bought in large quantities, as they do not keep well, and should be placed in an airtight tin. To clean currants for use they should be rubbed in a dry, clean cloth on which a little flour has been sprinkled, and shaken on to a sieve so that any stalks can be picked off, or they may be rubbed through a sieve with two or three teaspoonfuls of flour sprinkled over them. Unless there is plenty of time in which to dry them, currants are beat cleaned by means of flour instead of by water, for if used while damp they will make the cake or pudding heavy.

CURRANT SAWFLY. This is an insect pest called Nematus Ribesii which attacks currant and gooseberry bushes. It looks like a small butterfly, and is yellow in colour, with a black patch in the centre of the back. The pest is usually born early in spring, and commences to eat the young leaves of the bushes as they expand. Sometimes a second brood of these caterpillars appears later in the season.





Currant Sawfly.
Caterpillars on currant leaf.
Right, perfect insects; top, male; bottom, female, both highly magnified.

Spraying in no uncertain way with paraffin emulsion is the best remedy. In chronic cases it is best to remove all the soil round the bases of infected trees to a depth of 4 in. in winter-time and burn it. This usually destroys the cocoons, which would be the parents of the next season's pests. A dressing of lime to the soil is also recommended.

Consult Ministry of Agriculture Advisory Leaflets Nos. 114 and 176. *See* Black Currant; Gooseberry; Red Currant.

CURRY: INGREDIENTS AND FLAVOURINGS

Recipes for Meat, Chicken, Fish and Vegetable Curries

The reader interested in cookery may consult the articles Casserole; Chicken; also such entries as Bombay Duck; Chutney; Rice.

If carefully prepared and nicely balanced with regard to flavourings, curry stimulates the appetite and digestion. Many foods are suitable for curry dishes, including meat, poultry and rabbit, cooked or raw; also fish, vegetables and hard-boiled eggs. A number of ingredients are contained in Indian curries, the superior flavour of which is due to the use of fresh and dried spices and fruits instead of the curry powder relied on by many British cooks. Some of these ingredients are obtainable at good stores, as, for example, green ginger, turmeric, chillies, bottled tamarinds, garlic and saffron. A really good imported Indian curry powder should supply deficiencies in home cookery aided by curry paste, coconut milk or shredded coconuts, apple (which can be substituted for tamarinds), pickled gherkins and lemon juice. Flavouring is a question of taste, but no one flavour should be detectable in a well-balanced curry, which should not be too hot, too sweet or too acid.

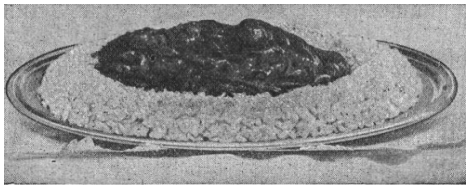
A curry should never appear on the table with a thin gravy, though there are wet and dry varieties; in the former the sauce is sufficient practically to cover the food curried; in the latter it has been absorbed during cooking by the other ingredients. Boiled rice, grated coconut and chutney should be served, on separate dishes with meat curries; Bombay duck (dried fish) may also accompany these. Rice is often placed as a border on the same dish with small quantities of fish, egg and dry meat curries. Vegetable and fish curries may be served at luncheon or informal suppers in individual pipkins garnished on the top with a spoonful of chutney, a small piece of fried red herring with chopped gherkin, or a slice of hard-boiled egg, surrounded by a little boiled rice. Anything with curry sauce should not be touched by steel; a wooden spoon is best for stirring the mixture in the casserole, and curry should be eaten with a fork, or spoon and fork.

Curries are always best cooked in an earthenware or glass casserole, or in a fireproof dish if the quantity is very small, as this gentle method of braising enhances the flavour, and provides a perfect method of dishing. A metal pan destroys some of the delicately balanced taste. Meat should be cut into cubes. When eggs are used they should be boiled first for fifteen minutes, shelled, and cut into halves before being heated gently in curry sauce. Small joints of rabbit, chicken or game may be fried in margarine or dripping before adding to the sauce. When fresh coconut milk is not obtainable, substitute the following if wishing to include this ingredient in a curry: Scrape some fresh coconut (or put a large tablespoonful of desiccated coconut) into a basin and pour over it enough boiling water to cover; let it soak for half an hour, and then strain off the liquid for use.

In Indian curries the foundation fat for sauce and frying meats is known as ghee. This is butter into which green mint and cloves are put while it is being clarified which gives to the curry a subtle flavouring.

Rice for Curries. Patna is the best rice to use for curry-making, as it has long, pointed grains that separate easily after cooking. It should be perfectly white and dry when served. To prepare it, wash a breakfastcupful thoroughly, and then place it in a pan of salted boiling water. Keep this boiling briskly with the lid off for about 20 min., and stir the rice frequently. When the grains are thoroughly soft, turn the rice into a warmed colander, and then pour boiling water over it. This will separate the grains. When this method is employed it is unnecessary to dry the rice over the stove or in the oven. It should be heaped on to a hot dish, and arranged with a fork.

Meat Curries. If fresh meat is used for a curry it is a good plan to fry it in butter or margarine before laying it in the curry sauce. As curry is such an excellent method for doing up left-overs of joints etc., cooked meat is more often used for this purpose. Any of the ingredients already mentioned may be used to flavour the sauce or added to the curry whilst cooking. The recipes given suggest variations suitable for the particular dish.



Carried Prawns, a savoury dish served with a border of rice.

For a curry of cold cooked veal, first prepare the sauce. For this, melt in a casserole 2 oz, butter and fry in it, without colouring, a large onion and a medium-sized apple, both prepared and chopped small. Strain off the fat from these and reserve them, then return the fat to the pan. Add a tablespoonful of curry powder mixed with a dessertspoonful of flour and let these cook gently for 12 min. Add the reserved onion and apple and stir in about a pint of white stock. Let the sauce boil up and mix in a dessertspoonful of curry paste, ½ oz. blanched and chopped almonds, ½ gill cream or milk, the juice of half a lemon, and seasoning to taste.

Cut 1 lb. of lean cooked veal, previously freed from skin and bone, into cubes, place it in the casserole and simmer gently until thoroughly heated through, but do not allow the curry to boil. Serve with cut lemon, boiled rice and chutney.

A good mutton curry is prepared from the following ingredients: 1 lb. mutton cut into cubes, 2 oz. mint flavoured butter, 1 large shredded onion, 1 tablespoonful each of curry powder and cornflour, 1 finely minced apple, a teaspoonful each of curry paste, lemon juice and chopped gherkin, salt to taste.

Rub an aluminium frying-pan with a crust of bread flavoured with garlic. Place the mint-butter and onions and meat in the pan and fry lightly. Remove meat and onions to casserole, and gently stir into the butter in the frying-pan the curry powder and cornflour. When smooth add ¾ pint stock and salt to taste, and bring to the boil while stirring. Pour this sauce over the meat and onions in the casserole, add the other ingredients, stir the mixture well and allow to simmer until cooked. Serve in the same way as the veal curry, but without sliced lemon.

Kidneys are excellent curried; either calf's or sheep's kidneys may be used, but the former require longer cooking. Split, skin and slice neatly four kidneys and put into the casserole with 1 oz. butter, one thinly-sliced onion, one small chopped apple and a squeeze of lemon juice.

Continue cooking for a few minutes, taking care that the whole does not burn; then stir in ½ oz. of rice flour, ½ dessertspoonful of curry powder, a little chutney and seasoning. When these ingredients are thoroughly mixed, pour over them a breakfastcupful of stock, and stew the kidneys for ½ hour, or until they are tender.

Before taking the curry from the pan, add a little cream to it and serve it with a border of boiled rice.

Rabbit and Chicken Curries. To curry a rabbit, cut the flesh into convenient sized pieces, season them to taste, and fry them lightly in a lump of butter about twice the size of a hen's egg. Add 3 or 4 dessertspoon fuls of finely chopped onion, and continue cooking gently for about ¼ hour. Then stir in 2 teaspoonfuls each of flour and curry powder, mixed smoothly with a little, cold water. Add a bunch of mixed herbs, a dessertspoonful of chutney, and 1½ breakfast-cupfuls of stock. Simmer for about ½ hour, or until the meat is found to be tender. The bunch of herbs, of course, should be removed before serving.

For curried chicken, having cut the bird into neat joints, dust these with flour. Cut two onions into small pieces, slicing them down from the crown; fry these in 4 oz. of margarine or butter, then strain them and lay them aside. Add 2 tablespoonfuls of curry powder and the pieces of chicken to the butter in the pan, fry these gently for 15 or 20 min., then add a small chopped apple, the fried onions, a few blanched and chopped almonds, a few sultanas, and ½ pint of white stock. Pour in a teacupful of coconut milk, and add a teaspoonful of curry paste; then season and cook all gently until the liquor is thereby reduced in quantity by one third.

Before serving, carefully remove all fat from the surface and add a dessertspoonful of lemon juice. Send the dish to the table very hot with boiled rice served on a separate dish. If liked, the chicken may be removed from the casserole, placed round the heaped rice on a dish and the sauce passed through a sieve before being reheated and poured over the pieces of chicken. Any poultry or game may be curried in this way.

Fish Curries. A good curry sauce in which fish can be afterwards cooked is prepared by sprinkling a small finely-chopped onion with a little flour, and then frying it in ½ oz. of butter. When it is light brown, add 1 dessertspoonful of curry powder, and continue frying for a few minutes before putting in 1 dessertspoonful each of chopped chutney and flour. Add 1½ gills of vegetable stock, and stir the mixture until it boils and becomes of a creamy consistency. Then gradually add ½ gill or less of cream or milk.

Curried prawns are made with a pint of curry sauce, using fish stock or a stock made from boiling the bruised prawn shells. Add 1 pint of prawns and let them simmer for a few minutes. Serve them on a hot dish with a border of boiled rice. An illustration of this dish is given in the previous page.

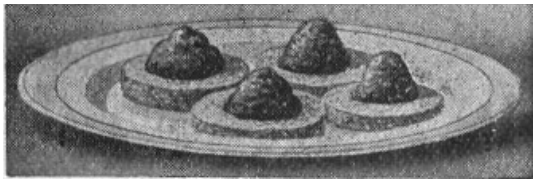
To curry lobster cut up the flesh into pieces of a convenient size, heat them in curry sauce and dish in the same way as curried prawns. Chutney should be served separately. Any cooked white fish can be coarsely flaked and reheated in curry sauce, first simmering the latter for 10 minutes. The addition of a little chopped apple and a squeeze of lemon to the curry sauce is sometimes liked.

Vegetable Curries. Any vegetables, such as small turnips, onions, carrots, pieces of cauliflower, French beans, peas, and small potatoes, may be used for a vegetable curry. First cook the vegetables until they are soft but not pulpy, and then add them to the curry sauce. Simmer for ½ hour, add a squeeze of lemon juice and a lump of sugar, serving the curry with boiled rice.

Cooked lentils, butter, or haricot beans may be curried separately. Add 1 pint to sufficient heated curry sauce to cover the vegetables in the casserole. Slice in two scalded and peeled tomatoes, add a teaspoonful of curry paste, and serve in individual pipkins with chopped gherkins and rice.

Curry Croustades. A useful way of serving a neat little curried dish at breakfast or supper is to place a tablespoonful of flaked fish or minced meat heated in sufficient curry sauce to flavour, but not to make too moist, in croustades. To prepare these, cut 2 or 3 slices of bread about 2 in. thick and stamp them out into rounds with a plain cutter the size of a wine glass, scooping out the crumb from the centre until only cases of bread remain. Let these soak in a little milk for 3

min., then beat up an egg and brush a little over each case. Cover them with breadcrumbs and try them a golden brown.



Curry Croustades, which can be made either with flaked fish or with minced meat.

CURRY COMB. This form of comb is used for grooming horses, its object being to free them from the dirt that adheres to the skin. The comb should be used first from the neck to the shoulder; the operation should then be continued downwards to the legs, and finally along the breast and underpart of the animal. *See* Horse.

CURTAINS: HOW TO CHOOSE AND MAKE

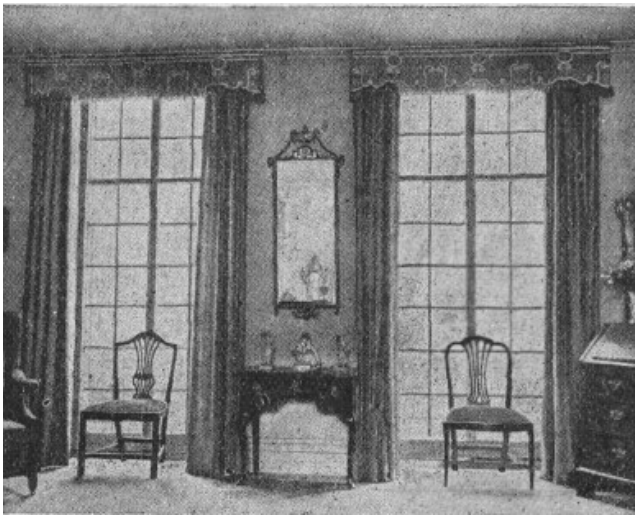
Decorative and Practical Ideas for Window Treatments

This article concludes with information about the fittings and other accessories of curtains. See American Cloth; Bay Window; Bedroom; Casement; Colour; Drawing Room, etc.

Curtain treatments may be simple or elaborate, but they must bear a definite relation to the colour scheme of the surrounding interior. Occasionally a thought should be given to the view through the window. Jade green curtains, for instance, will not look well framing a mass of summer foliage, nor will bluish pinks, or fuchsia shades of red, harmonise with the view of a red brick wall. A certain agreement is also pleasant between the various window curtains of the home as seen from outside. This is easily achieved, without being tied to one colour or fabric, by a lining in one set, by the ground of a cretonne in another, by the pattern in a third and by the solid colour of a fourth, all introducing the same shade, which in turn should contrast happily with exterior paintwork.

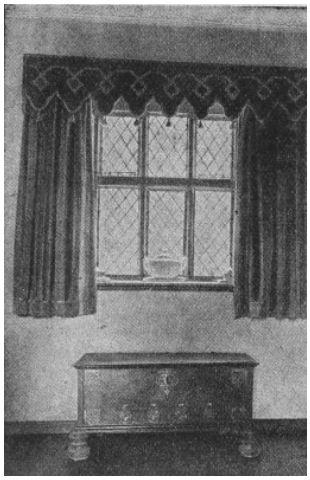
Colour and Pattern. With regard to interior colour schemes, curtains should accentuate a note in a room or afford a good contrast. Sometimes they may do both, as, for instance, when a patterned material is used which matches the loose covers, but in the case of the curtain is bordered and edged with a plain material, which is repeated for the valance or pelmet; or the pattern may pick up the colours of tiles and paintwork, while the plainer material of the border matches the upholstery. This scheme is a pleasing treat-ment for printed linen or cretonne with a rep border and is particularly attractive for an informal sitting room or a town bedroom with glass curtains of ivory net woven in square mesh. It may equally well be utilised for a French window, or a double sash window, but in the first case the net curtains are best fitted to each half of the window and held in place at the bottom by a second rod so that they do not swing out when the windows are unfastened.

For French windows in the more formal room, the type of curtain shown in the first illustration is suitable, especially if the ceiling is low, as the long line of plain fabric with the narrow gracefully braided pelmet gives height. Such curtains would look equally well in shot artificial silk, in satin or, for a dining room, in furnishing velours or velvet. Such pelmets could be trimmed with motifs bought ready embroidered and only requiring to be lightly sewn on, connecting the design with a braid which can be bought to match. For a room with any Chinese lacquer furniture the pelmet could be bordered with strips of Chinese embroidery or with motifs in the dragon design. Hand-worked appliqué designs can be used with great advantage on a pelmet of this type; or it may be simply bound with ribbon of a contrasting colour.



Curtain. Plain satin curtains frame the French windows of the formal sitting room, while the braided pelmets are designed with curves to correspond with period furniture.

For the double sash window in a town house long outer curtains may frame lace store curtains to the sill. The advantage of the latter is that they can hide out a depressing view if necessary without obscuring light.



Curtain. Treatment for a hall or lounge window with braided and tasselled pelmet copied from an Elizabethan design.

A good formal treatment for a large bay window is to make an outer frame by means of pelmet and long curtains of rich plain fabric. These curtains are pleated on to a band so that they keep their rather narrow line. Practical

curtains in a contrasting colour are hung on an inner rod, bent to the shape of the bay, while lace store curtains fit the windows. This treatment looks well when carried out in deep hyacinth blue for the framing curtains, pelmet and curtains bordered with silver braid, the former having two long silver tassels that hang down over the curtains at the outer edges; the practical curtains are of artificial taffeta shot with a lighter blue and mauve and the store curtains are an ivory shade. Whatever the colour scheme selected to suit the room the framing curtains should be unpatterned and of darker tone than the practical ones. Vitrage laces may be utilised instead of store curtains for bay windows. These laces are made in panels and can be cut along the joins, one or more panels adjusting themselves to the fitting of narrow or wide windows. Brise-bise nets can be used for casements, or for lower sashes of bedroom windows with outer curtains to the sill. Crisp effects can be obtained by the use of organdie muslin, self-fitted.



Curtains and pelmet to suit a country cottage (Margaret Currant Studio)

Striped artificial silk fabrics bring a gay note into a room otherwise neutral in tone. A small dining room, carpeted with brown, and having parchment-coloured walls and a cold north light, was transformed by window curtains in bold stripes of orange with narrower stripes of gold, blue, green and chestnut-brown. The valance was composed of two layers of scalloped material, each scallop measuring six inches across. The points between the scallops were well defined, the lower scallop being placed beneath the cut up point of the top layer. This top layer was of chestnut-brown (which colour also lined the curtains), and the under layer of the predominating orange stripe. A sunny glow was introduced into the room with fine artificial silk net curtains in pale gold across the window. Beautiful curtain fabrics for lounge or dining room can also be had in patterned damasks and tapestries. The latter need plain walls to show off their beauty.

Short Curtains. For easement windows, the frilled or pleated valance with short curtains will look well in thinner materials. Valances may be box pleated on to a tape to which small rings are attached at close intervals. Hooks can then be screwed into the valance board so that the valance can be hung and not nailed to the board. If no valance or pelmet is used the curtains must be very neatly gathered into a heading at the top, or ugly gaps may be an eyesore between curtain and rod. If the top of the curtain is firmly pleated to a depth of several inches by means of rows of stitching it will give a delightfully neat heading. Cretonne gathered valances need not be lined, but straight scalloped valances or pelmets in any material require this additional support and stiffness.

Bedroom curtains are better lined if they are practical and blinds are done away with; also, with the exception of taffeta and furnishing satin, fabrics hang better when lined. Short chintz, check gingham, bordered casement cloth, or coloured bolton sheeting curtains do not require lining unless it is particularly desired to darken the room at night. Pale coloured voile or spotted muslin are dainty fabrics for glass curtains in simply furnished bedrooms.

The second illustration shows a charming treatment for a hall window, the diamond points of the pelmet being trimmed with gold tassels, while gold braid is used to make the design. Either velvet, velours on heavy artificial silk rep would lend itself to the making of these curtains, which would look equally well in a small sitting room.

Plywood pelmets are sometimes seen with short curtains, and have cleanliness and neatness to recommend them as well as possibilities of decorative treatment. They can be painted the same colour as the woodwork of the room, decorated with a stencil pattern, or repeat the groundwork of cretonne curtains. The edge of such a pelmet can be left straight or curves can be introduced by means of a fret saw. Painted with gold or silver metallic paint and outlined with a colour, they are decorative in a modern room. They are right for the up-to-date kitchenette where coloured paint is to be used for woodwork, and also for the nursery with stencilled animals or fairy tale characters. They may combine successfully with American cloth, cretonne or chintz for these rooms. The third illustration shows a curtain treatment that is particularly suitable for a bungalow window, having a painted plywood pelmet decorated with two lines of colour.

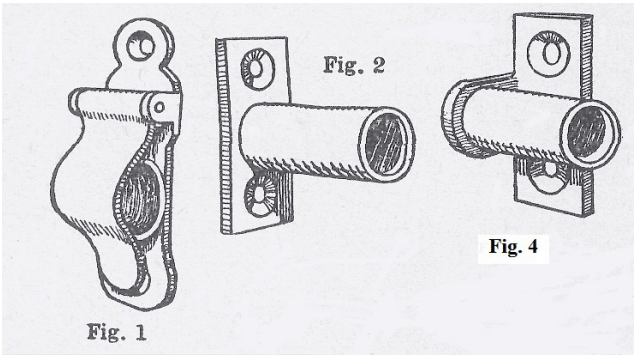
Bathroom curtains may be of brightly patterned towelling, rubberised cotton fabric or oiled silk, though washable checked or striped materials are also suitable.

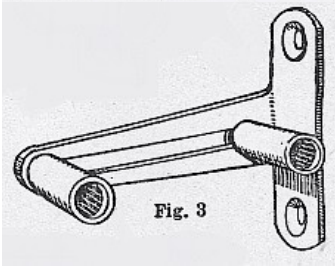
Details for Making. Several labour-saving devices are on the market which simplify making and washing. A heading tape can be obtained in three sizes for light, medium and heavy curtains which only requires to be machined to the back of the curtain heading and then drawn up to the width required when finished. Rings and hooks are sold with it which may be detached or fixed in a moment, while the headings can be let out so that when the curtains are washed and ironed they are straight. A curtain gliding rail is also obtainable which

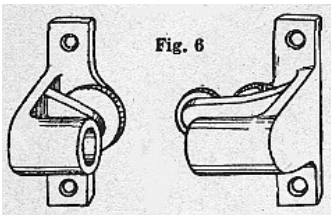
simplifies hanging light or heavy curtains and can be supplied with a valance extension. The hooks on the heading tape fit into the rings on the rail, so that the problem of taking curtains down for cleaning or washing and putting them up again is reduced to a minimum.

Flexible and adjustable wires with rings at the ends which fix on to small hooks on the window frame are the best means for hanging lace and net glass curtains. These wires are simply threaded through a hem and, being stretched to the width of the windows, keep the top of the curtains taut.

Poles and Rods. Curtain poles averaging 1 in. or more in diameter are adapted for large windows, doorways and openings. Curtain rods are of smaller diameter, used generally for casement windows. The materials are brass-cased iron tube and wooden dowel rods, the latter from 5/16 to ½ in. diameter, up to 6 ft. long. The patent curtain rod brackets shown in Fig. 1 may be used for supporting rods up to ¾ in. diameter.







Curtain Poles and Rods. Figs. 1-4 and 6. Common fittings for holding one or more brass curtain rods.

When it is only possible to fit the rod between the jambs of a window opening, the fitting shown in Fig. 2 is especially useful. The brass ferrule is arranged to unscrew from the base to facilitate removal of the curtain rod. This type of fitting is available for rods from ½ in. to ¾ in. diameter.

For fitting two curtain rods parallel to each other, one for the curtain and the other for the valance, a double bracket fitting, as in Fig. 3, is most convenient. It is adjustable, and the inner rod can be ⅜ in. from the window frame, while the outer rod extends another 3 in. The other ends of the rods are carried in simple projecting brackets, as shown in Fig. 4. All these fittings are screwed to the window frame with countersunk brass screws. The fitting of curtains to a small bay window or oriel is greatly simplified by using spring wire, bought by the foot from any ironmonger, with the hooks for supporting the wire and the eyes for screwing into the ends of the spring wire. The hooks are fixed at each angle of the window frame, the spring wire passing over them.

The Valance Board. In a house with concrete walls arid metal-framed casement windows, to which the usual curtain fittings cannot be screwed in the ordinary way, the plan is to fix a valance board on brackets screwed to the wall on the Rawlplug system. Where there is no pelmet or valance board long curtains are generally attached to a number of wood or brass rings, free to slide along the horizontal pole supported on brackets at the top of the window frame. The pole is provided with detachable ornamental ends large enough to keep the rings from sliding off.

In the case of a plain pole and no cords the curtains have to be pulled or jerked along by hand when opening or closing. An improvement is to have pulleys fitted to the ends of the pole and cords hanging from them and connected to the rings, so that the latter can be drawn along the pole by the cord. With a pair of curtains divided in the middle this movement must be in opposite directions, and the pulleys are arranged so that the pulling of one cord accomplishes this. The principle is indicated in Fig. 5.

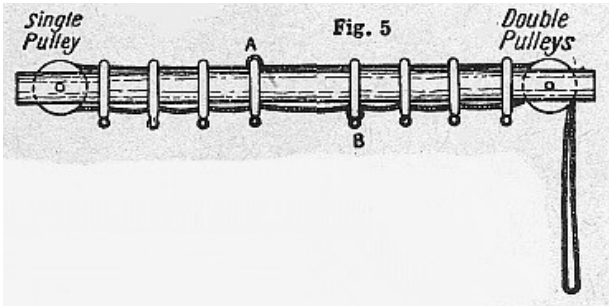


Fig. 5. Device for opening and closing curtains.

This is done by using the opposite directions of travel of the cord, which goes to the far end of the pole, passes over a pulley, and comes back. The middle two rings, A B, of the set are attached to the cord, so that in its travel it pulls one in one direction and the other in the opposite. The pulleys are generally fitted into slots in the pole. In other cases the pulleys are attached to the brackets, an example of which is shown in Fig. 6. For bay windows the pole must be in lengths and at angles to suit the bay. A typical example is shown in Fig. 7, the required dimensions being marked D. A is the pole, and C C the supporting brackets. The angle joints B must be cut to the correct angle, which can be ascertained as follows: On a sheet of paper draw the two parallel lines, E F, G H (Fig. 8), the distance between them being equal to the diameter of the curtain rod. Then cut a card template to the angle of the window, as at L°, and draw lines, A B, C D.

The points of intersection, marked K J, should now be joined with another line, which shows the exact angle to which to cut the ends. When cutting the rod keep the end faces perpendicular, otherwise the rod

will not be flat when jointed. All trouble may be avoided by using the metal connexions made for the purpose. These screw into the ends of the pole, which in this case is cut square at the ends, and measurements are taken to the centre of the joint. One of these metal connexions is shown in Fig. 9.

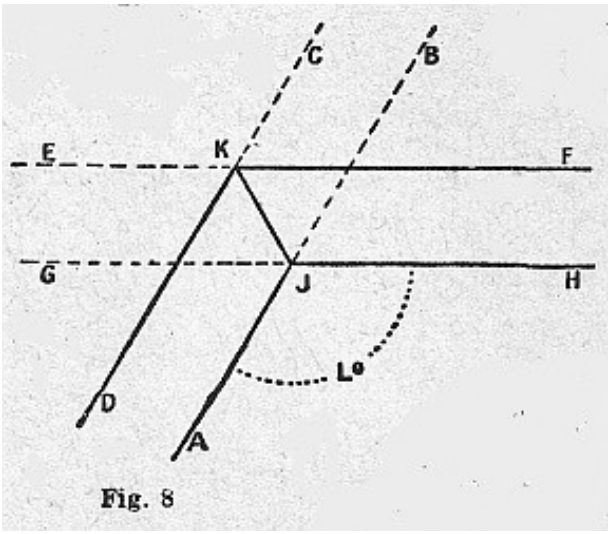
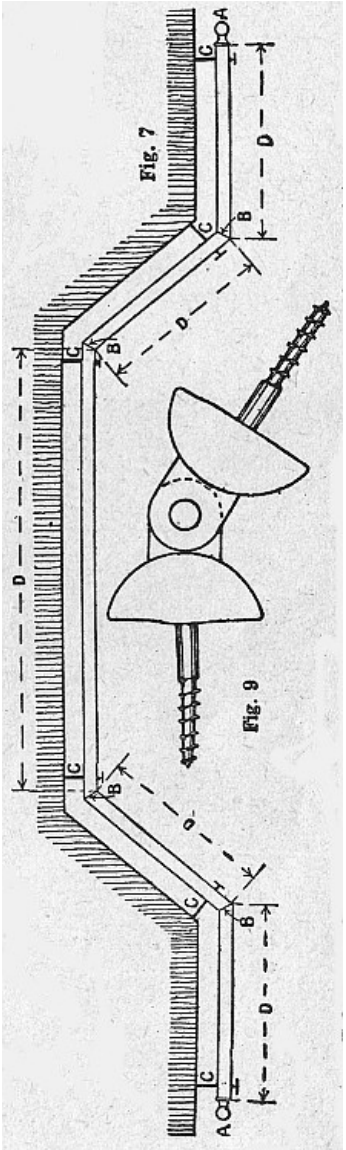


Fig. 8



Figs. 7-9. Diagrams showing how to fit a curtain pole to a bay window.

CURVATURE OF THE SPINE.

There are several forms of curvature of the spine, to each of which a distinctive name is applied. In scoliosis, or lateral curvature, the spinal column or backbone is bent to one side; kyphosis is an increase in its main backward curve, and lordosis is an increase of the hollow at the loins. A more serious condition is angular curvature, or Pott's Disease. This is due to disease of the vertebrae or to fracture.

The predisposing cause of scoliosis is weakness of the back muscles and general debility; the curvature may be induced by habitual faulty postures or by carrying weights which overtax the strength. Examples of this are: writing at a low desk with one shoulder higher than the other; standing with the weight on one leg; carrying a weight habitually on one arm, as in the case of a nursemaid. This type of curvature is common in young people of about 14 years and upwards. Other causes which may bring it about are rickets, knock-knee, empyema, unequal length of the legs, dislocation of the hip from birth, and paralysis of the muscles of the back on one side. The advice and supervision of the doctor should be obtained. Rickets, if present, must be cured, and the general health brought up to and maintained at a proper standard by fresh air, indoors as well as out, sufficient good, simple food, tepid bathing, sufficient rest and sleep and, if there is anaemia, an iron tonic.

Kyphosis is an increase of the natural backward arch of the spine from the neck down to the small of the back. It may occur in rickety infants, in children with weak back muscles, and in grown people who follow stooping occupations. If the infant is treated for rickets and kept in a lying position, the curve will in nearly all cases disappear as he gains strength. In growing children this form of curvature develops from the practice of stooping when writing, reading, sewing, etc. Short sight is sometimes answerable for this faulty habit. The treatment is the same as for lateral curvature. Glasses should be worn when the sight is defective.

In angular curvature, or Pott's Disease, tuberculosis attacks one or more of the vertebrae, as a result of which the bones as well as one or more of the cartilaginous disks between them soften and crumble away. The part of the backbone above the point of disease then settles down on the part below, and bending forward results. The disease may occur at any age, but is most frequent in children. Frequently it follows a blow on the back or a strain.

In treating Pott's Disease the usual measures for tuberculosis in any part of the body are to be carried out, and complete rest must be secured for the spine. The patient's room should be airy and sunny, and he should be carried into the open air as much as possible. His diet must be abundant and nutritious. *See* Spine.

CUSHIONS: MATERIALS AND DESIGNS

Pleasing and Colourful Aids to Comfort

Helpful information will also be found under the headings Appliqué; Embroidery; Raffia; Woodwork. See also Drawing Room.

Although cushions were formerly considered merely as general aids to comfort, to-day they should be chosen to form a vital part of the colour scheme and general furnishing of the room in which they are to be used. It is the greatest mistake to allow the cushions in a room to bring in colour notes that are not in harmony with the whole. A divan covered in some neutral coloured material or in a fabric that tones with the walls of the room will provide a good setting for piles of cushions, each one covered in one of the colours used in the main colour scheme (q.v.). Whatever

colours are chosen for these cushions the material should be plain.

It should be a golden rule that when chair and settee covers are made in a patterned material the cushions should be covered either in the same material or in a plain fabric in one of the colours included in the pattern.

When chairs are covered in cretonne chintz or upholstery linen, the cushions to go with them should be in a similar linen or cotton fabric and not in silk or satin. These latter fabrics would be quite in keeping, of course, with chairs covered in heavy upholstery satins, damasks or taffetas.

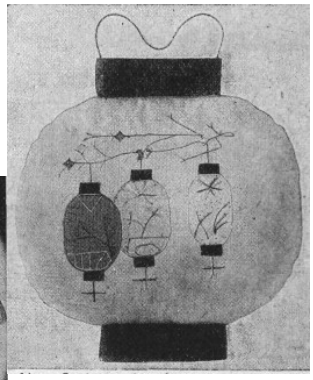
One of the most effective ways of bringing cushions into line with the general colour scheme of a room is the following: Choose some gaily patterned linen or chintz for curtains. Bright flowers in natural colours on a cream ground always look well. To go with this, chair and settee covers in a heavy linen to tone with the background of the curtain material can be piped with one of the bright flower colours in the design. Then the scheme can be further worked out by introducing the remaining flower colours and the green of the leaves in plain linen covers for the cushions.

Quilted satin and silk cushions are very fashionable nowadays for rooms where curtains are of any type of furnishing silk, satin, damask or velvet. *See* Quilting.

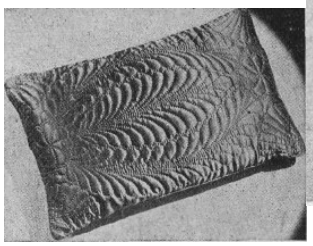
With 1¼ yards of 31-inch material, either a round or square cushion of average size can be covered. Cut two circles, 21½ inches in diameter (a paper pattern can be cut first from the cushion to be covered), or two squares of 21½ inches each, and also a band 4 inches deep to be set all round the sides to make the cushions mattress shape. The seams may be piped to match or with a contrasting colour. If to be appliqué or embroidered the one side of the cushion will be worked before making up. Such cushions lend themselves to an endless variety of designs. Terry towelling makes delightful nursery cushions either patterned or in plain bright colours.

Garden Cushions. Raffia cloth in the natural colour is a good covering for outdoor cushions, with a lining of sateen or other close fabric, and bias binding for the edges if rounded. Simple wool or raffia embroidery can be used to trim such cushions. Hessian is another excellent covering material. This coarse canvas may be stencilled or lends itself to embroidery in cross-stitch; simple garden or flower bed designs look well and transfers are obtainable which are quickly worked in wools. Crash cushions embroidered with a group of circles in darning stitch are also suitable. The circles can be traced on the crash by pencilling round the inverted edges of small cups and saucers. American cloth provides a damp-proof reverse side for garden pouffes and mattress cushions. Waterproof cretonne cushions are obtainable to match the coverings of deck chairs.

To brighten cane or canvas chairs for the verandah, loggia or garden, a useful and attractive cushion can be made in the form of a Japanese lantern. This has an appliqué design of three little Japanese lanterns which might be carried out in pink, green and yellow respectively, and is made of either crash or casement cloth in a contrasting colour. Two oval pieces of the material are cut 20 inches by 16 inches for the body of the cushion, and two pieces of black sateen for the top and bottom of the cushion, measuring 8½ by 3 inches each. The three small lanterns are applied with stem-stitch, and apparently hang from a spray easily drawn on the material with pencil and also to be stem-stitched and decorated with a few little pink flowers in buttonhole-stitch.



Cushion. Lantern cushion for a garden chair. The design is appliqué with stem-stitch.



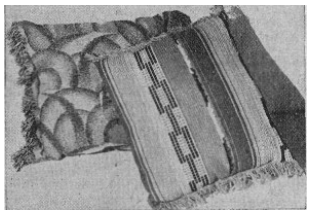
Left. Cushion. A many-coloured quilted cushion made by miners' wives in the "Special Areas."



Left: cretonne-covered, with frill, kapok-filled, Jacobean design.



Right: vivid Indian hand-embroidered wool; brown hessian back.



Left: fringed folk-weave, darned and tufted, in many different colours.

To make up the cushion these two ovals are joined together with a piping inserted while the two black satin oblongs are placed in the middle of the long sides of the oval pieces to represent the top and bottom of the lantern. A black cord is attached by which the cushion is suspended to the back of the chair. This obviates constant slipping when the occupant moves. Leather, dyed chamois, or air cushions are most suitable for cars.

Cushions in Richer Fabrics. For the more formal type of sitting room, lounge or dining room where the furniture is upholstered in velvet, silk rep, leather, or damask richer materials are needed for suitable cushions. On a dining room settee with brown velvet loose seat cushions, large round brown velvet extra

cushions will look well trimmed with leather panels in a contrasting colour. Round cushions are also often particularly suitable for a window seat, as they help to reduce the apparent squareness of an old-fashioned window. Oval and pillow-shaped satin cushions look right with 18th century styles. Floor cushions give a luxuriously comfortable look to the hearthrug in winter. These should be large, deep, and made of a suitable heavy material such as damask, furnishing velours or rep.

Although cushions for rooms in period or special styles should be of rich materials they need not be costly. Setting aside for the fine needlewoman the beautifully embroidered designs, there are some effective methods of trimming which demand no special skill. For a room with lacquer pieces of furniture Chinese strips, rounds or squares of embroidery can be used, either placed to form a pattern on a plain coloured or black cushion and applied by means of a narrow galon, or (as in the case of rounds and squares) laid flat in the centre of the cushion, and the silk, or other material with which the cushion is to be covered gathered round it on a gauging cord.

A bolster cushion shape can be bought and covered in velvet, with ends either cut into rounds and piped to fit the bolster, or pleated into a button to hold the folds in place.

Gold-coloured cushions in crinkly satin have the appearance of being tissue-covered, but are soft and do not tarnish. This satin is good trimmed with self piping on a thick cord, and coloured wooden beads devised into tassels, or into flat ornaments at three of the corners, with a large dangling one of padded satin and beads over the edge of a sofa for the fourth.

Round, square or bolster cushions covered with satin or shot taffeta are ornamental, especially for using on a couch or divan in alliance with smaller cushions covered in contrasting fabrics. Lace or beautifully embroidered muslin can be used as covers for small head cushions, which look their best piled on divans or day beds with larger cushions in various shapes. These add considerably to the comfort of large armchairs, and fill up odd corners; they lend support to a tired back, or act as an extra support for the back of the head. Covered in muslin on embroidered linen, they are often provided on beds. Round or square cushions can be trimmed with appliqué or covered with patchwork in geometrical patterns. This costs nothing where there is a scrap drawer containing odd pieces of silks, satins, ribbons and tinsel brocades. The simpler
he designs the better. They are cut out first in paper, pinned on the cushion cover to judge the effect, and then cut out in the various materials. Designs may be traced or drawn freehand before cutting out.

CUSPARIA BARK. In medicine cusparia bark, which is an aromatic bitter obtained from a S. American tree, can be employed to increase appetite. Two preparations are used, of which the doses are: Infusion of cusparia, 1 to 2 fluid oz.; concentrate of cusparia, ½ to 1 fluid dram.

CUSTARD. To make a simple boiled custard, allow 2 eggs to 1 pint milk, and use 2 dessertspoonfuls castor sugar, with flavouring to taste. Beat the eggs well and stir in the sugar. Bring the milk to the boil and then pour it gradually on to the eggs, stirring all the time. Pour all into a stone jar or a jug and put this into a pan of boiling water. Stir the custard until it thickens. Then remove it from the pan, add flavouring essence, and pour it into a bowl to cool. If lemon flavour is desired, let a little lemon rind boil with the milk.

Confectioner's custard is sometimes used as a substitute for cream in filling chocolate éclairs, etc. It is prepared by mixing a little more than 1 oz. cornflour with ¾ pint milk and stirring the paste in a small saucepan over the fire until it boils. Then let it simmer for several minutes, afterwards adding the yolks of 3 eggs, 1½ oz. sugar, and a little vanilla essence. Cook the custard slowly, stirring it all the time, and when it thickens take it from the fire and allow it to cool.

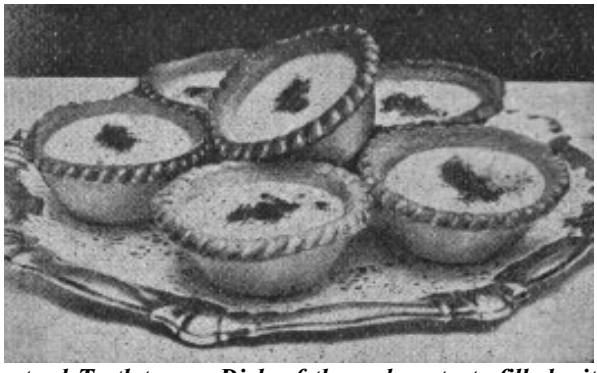
Custard Powder. A custard powder can be made at home from cornflour and riceflour. These should be mixed in equal parts, and it is essential that the ingredients should be quite dry and that they should be sieved to ensure their being free from lumps. The powder can be coloured yellow with powdered turmeric. One tablespoouful of custard powder should be used to every pint of milk. The powder should be mixed to a smooth paste with a little cold milk, and the remainder of the milk brought to the boil and then poured on to the paste, stirring being continued all the time. Flavouring and sweetening are added to the mixture as the milk boils.

Steamed Custard. To prepare a steamed custard pudding, beat up 2 eggs with sugar to taste, and add a pint of milk and the desired flavouring. Pour the whole into a greased basin, cover it with greased paper, and put it into a steamer or into a pan half filled with boiling water. Let the water simmer very gently for about half an hour, until the pudding is set.

A good variant from plain custard pudding is provided by this recipe. Put ¼ lb. jam into the bottom of a greased pie-dish, and sprinkle over it a tumblerful of breadcrumbs. Pour over the whole a pint of custard made as above, taking care not to disturb the jam at the bottom of the dish, and bake the pudding in a moderately hot oven for 20 to 30 min.

Custard Tartlet. The pastry for these tartlets is prepared by sieving 8 oz. flour, adding a pinch of salt, and then rubbing in 2 oz. margarine and the same quantity of lard. Add enough cold water to mix the whole to a stiff paste. Roll it out till it is about ⅛ in. thick, then cut it into small rounds and line some deep tartlet tins with it. Line each case with a piece of greased paper and then fill it up with uncooked rice to

prevent it from rising in the centre. Bake the cases for about 15 min., or until they are lightly browned. Then take out the paper and rice, and leave the cases on a sieve to cool. Make ¾ pint of thick custard, flavour it with vanilla and leave it to cool. Then put it into the cases, and grate a little nutmeg over the top of each. A little raspberry jam may be placed in the bottom of each case before the custard.



Custard Tartlet. Dish of these deep tarts filled with thick custard and sprinkled with nutmeg.

Another variety of custard tartlet is prepared by lining patty pans with a short crust, and three-parts filling them with custard. Bake them until slightly browned and leave them to cool on a sieve. Make some sugar icing by mixing the whipped white of 1 egg with 1 oz. of castor sugar, spread this over the tartlets, sprinkle some more sugar on top, and then bake them slowly until the icing is crisp. These tartlets can be made still richer if a little jam is put into the cases under the custard.

CUT: How to Treat. Slight clean-out wounds, such as are made with a knife, should be cleansed by holding under a tap for a few moments, or by bathing the part with clean cold water, or, preferably, carbolic acid lotion (1 in 40) or a solution of boric acid. Lint, cotton, wool, or clean linen should be used for the purpose. As soon as bleeding stops bring the edges accurately together, sprinkle on a thin covering of boracic powder, a dressing of lint or clean linen, and bandage. A little boric ointment may be applied, or the wound may be covered with flexible collodion. Whenever festering occurs, dress with some antiseptic, such as boric, salicylic, or cyanide gauze, after thoroughly washing with one of the above mentioned or another antiseptic lotion.

A cut of any size, or a deep cut which bleeds profusely, should be covered over with a towel soaked in cold water (or, better still, a 1 in 40 solution of carbolic acid and water) while waiting the doctor's arrival. Efforts should be made to control the bleeding by applying pressure over the wound, or, if this does not succeed, on the main vessel supplying the part. If there is any delay in the doctor's arrival a tourniquet may be put on. *See* Bandage; Bleeding; First Aid; Tourniquet.

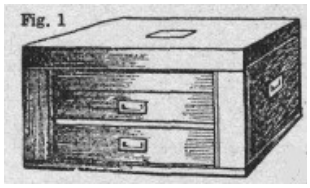
CUTLERY AND THE CUTLERY CANTEEN

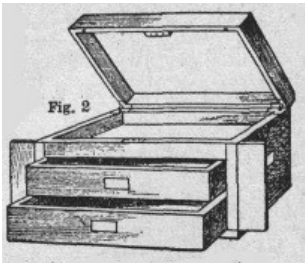
Directions for Making a Useful Receptacle

Detailed information about the various kinds of cutlery will be found under the headings Fork; Knife; Spoon, etc. See also Cabinet Making; Drawer, etc.

Under this general name all small cutting instruments are included, such as scissors, razors, knives and carvers for fish, poultry and meat. Table cutlery sold in sets in a canteen or cutlery cabinet may, in addition to knives in two sizes, contain forks and spoons, fish and fruit knives and forks, tablespoons, gravy spoons and carvers. Sets may contain sufficient articles for twelve or six persons.

Making a Canteen. A cutlery canteen, as at Figs. 1 and 2, has much to recommend it. Fig. 1 shows the cabinet closed by means of locking pilasters, sunk handles being fitted to drawers and also to the cabinet ends for lifting purposes. Fig. 2 shows the cabinet opened out, including a lift-up lid with well immediately under it, and also a couple of drawers or pull-out trays.





Cutlery Canteen. Figs. 1 and 2. The canteen, which is in polished wood and has a tray and two drawers, shown closed and open.

It can be made in oak, well seasoned and sound, stained to a rich nut-brown colour and polished. An inlaid tablet of brass on the lid will heighten the finished effect.

The length of cabinet is 1 ft. 3½ in. by 12½ in. wide by 8 ¼ in. over all. The lift-up lid is 1½ in. deep outside, to be fitted as a tray for cheese knives. The upper well is 1 ¼ in. deep, with special fittings. The upper drawer should be allowed 1 ⅞ in. deep over outside front, and the lower one 2 ¾ in. deep. Each of the latter has special fittings for the various items to be contained in compact dozens or half-dozens.

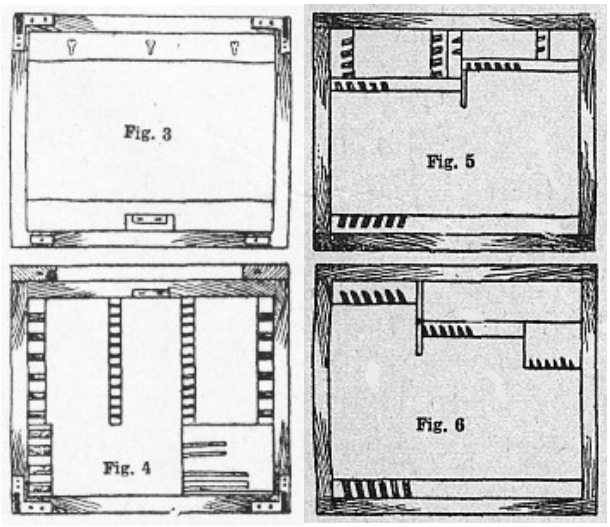
Two sides of the case can first be got out to finish ll ¾ in. by 6 ¼ in. by ⅝ in. thick after planing up clean and true. For the back a piece of equal thickness to finish 15½ by 6 ¼ in. will be required, these parts being preferably mitre-dovetailed together, or housed and screwed or dowelled together. The front has a top rail 1½ in. by ¾ in. dovetailed into position for preference, but may be tenoned or dowelled instead to the sides. The upper tray bottom can be of ¼ in. wood cleaned up and grooved into sides and back, and the front edge rebated, glued and panel-pinned into front rail. A bearer rail under the upper drawer to finish ⅜ in. thick may be continued from front to back to form a

dustboard. The bottom, to allow the locking pilasters to close in flush, will project ¾ in. at front and finish ½ in. thick, to fit flush at sides and back. It should be screwed up to sides and back with brass screws.

The drawers (or pull-out trays) should be made as dust-tight as possible. Fronts had best finish ¾ in. thick: sides and backs ⅜ in. thick, bottoms ¼ in. thick, let in flush.

The fronts, sides and backs of the drawers are dovetailed together, each front being fitted with a sunk or flush brass handle or a cup handle. All should close in flush ready for locking the pilasters. These finish 6 ¼ in. long, hinged with brass piano hinges. A ¼ in. hole with brass bush is also sunk into each top edge of same. The finishing depth of the upper tray will be 1 ¼ in. inside, of the upper drawer 1⅜ in. full, and lower drawer 2 ¼ in. full. These receptacles should have bottoms and sides covered with green baize or a suitable cloth. If the bottom is lined first, the sides and back can be fitted with cloth-covered slips of three-ply.

For the lid, two pieces 15 ½ in. by 1 ¼ in. net will be needed, and two pieces 12½ in. by 1 ⅜ in. net for the sides. The top finishes 15 ½ in. by 12 ½ in. by ⅜ in. thick. The sides should be mitre-dovetailed together, and the top rebated in ¼ in. deep, the remaining ⅛ in. forming the top edge, to be rounded or bevelled off.



Cutlery Canteen. Details for making the cabinet shown above. Fig. 3. Lid. Fig. 4. Top tray. Fig. 5. Plan of top drawer. Fig. 6. Plan of bottom drawer.

The hinges should be a special kind of quadrant box hinge, as at Fig. 8. The lock is fitted to a block inside centre of front of lid, to permit the lid to close down flush with the closed pilasters. A corresponding link plate is fitted to front rail of case. A couple of brass pin plates are also fitted to lid so that they drop into the holes in top edge of pilasters previously referred to. The fittings are slips of deal cut out with a fretsaw, then covered with cloth, using liquid glue, ordinary glue, or shoemakers' paste as an adhesive.

The lid, Fig. 3, can be fitted for 12 cheese knives, each fitting being about 1 ¾ in. wide by 1 in. high, and shown to larger scale at Figs. 9 and 10. The slip will be a shade under ⅞ in. high, notched out at intervals ⅞ in. wide by ⅝ in. high, to receive the handles. The capping can be of three-ply with a ¾ in. slip of same to lift up and be fastened down by clips as Fig. 3. The blades enter notches ⅞ in. by ½ in., as Fig. 10, the fitting being cloth-covered before inserting into position.

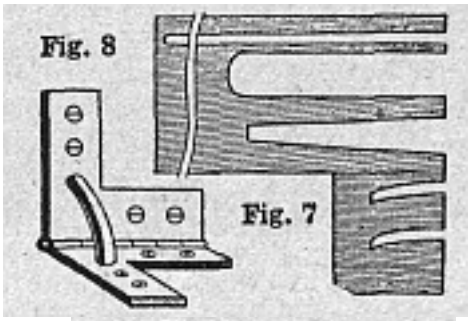
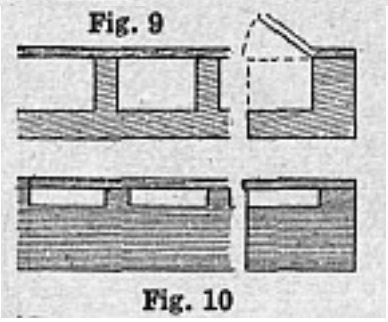


Fig. 7. Slips ftor carvers. Fig. 8. Quadrant hinge for lid. Figs. 9 and 10. Fittings for lid.



The top tray of case (Fig. 4) will have fittings for carving knives, steel and forks, and 12 table knives, the blades of which interlie. An enlarged detail of slips is shown at Fig. 7 for carvers and steel, the cuts being 4¾ in. by ⅛ in.; 3 in. by ⅜ in.; 2 ¾ in. by ¼ in., and 1 in. by ⅛ in., out of slips 1½ in. high, ¾ in. thick, with the cuts right through. The table knives can be in slips as Figs. 13 and 14, height being 1¼ in. full and thickness ⅝ in. for Fig. 13, with the cuts 3/16 in. wide by ¼ in. apart; and for Fig. 14 cuts are 11/16 in. high by ½ in. and ⅛ in. alternately, each cut being ¼ in. apart.

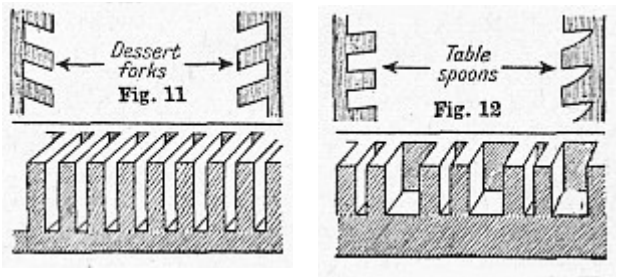
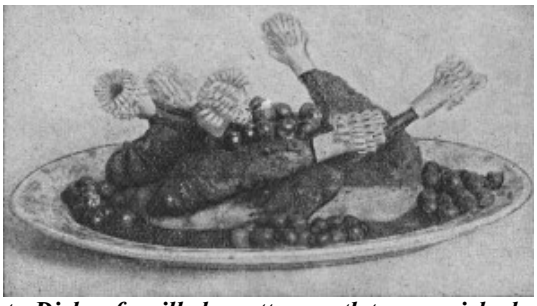


Fig. 11. Slips for dessert forks. Fig. 12. For tablespoons. Figs. 13 and 14 (below). Slips lor table knives.

The upper drawer can be fitted for, say, 6 teaspoons, 12 dessert forks, and 12 table forks. Size for slips is 1 ¼ in. high by ⅝ in. thick. The bottom drawer would take 6 tablespoons, 12 dessertspoons, and the remaining 6 teaspoons. Slips can be 2⅛ in. high. A plan of drawers is seen at Figs. 5 and 6. An enlarged repeat of the slips for these items is given at Figs. 11 and 12. The locking

pilasters are shown closed and open respectively in Figs. 1 and 2.

CUTLET: How to Cook. To prepare cutlets, trim away all pieces of fat, and if there is any bone in the centre cut this away. The bone at the end must be scraped bare and free from fat. Beat the cutlets with a wet cutlet bat or rolling-pin to make them tender and to improve the shape. They should not be more than ½ in. thick. Dust with flour that has been seasoned with salt and pepper, then coat with egg and breadcrumbs, and fry them. The cutlets can be dipped into melted butter and breadcrumbs, instead of egg. Cutlets can also be stewed in a casserole or plainly grilled.



Cutlet. Dish of grilled mutton cutlets, garnished with green peas and decorated with paper frills.

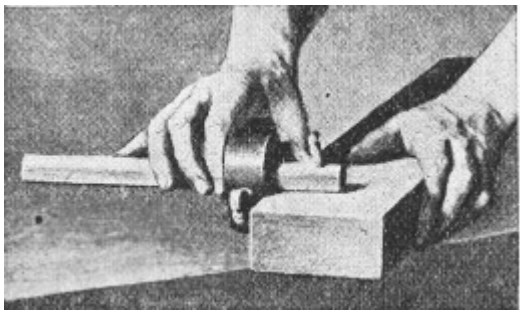
Cutlets are usually served on a mound of mashed potatoes, the cutlets being arranged with the bones pointing in one direction and wrapped round with paper frills. Various sauces can be served with them. Veal cutlets should be garnished with slices of cut lemon, lamb and mutton cutlets with chopped parsley.

Tomatoes, grilled or made into a purée, spinach sauté in butter, or green peas, are usually served with cutlets.

To make cutlets from the remains of cold veal, lamb, mutton, or fowl, mince the meat finely, season, add chopped parsley or any flavouring desired, and mix with the yolks of eggs until a firm mixture is obtained. Shape the mixture into cutlet form, coat with egg and breadcrumbs, and fry them. Cooked and flaked remains of fish can be treated in the same way. *See* Casserole; Mutton.

CUTTING GAUGE. This tool is for cutting lines on woodwork, making small rebates and for similar purposes, and serves the same purpose as a marking gauge. It consists of a steel cutter fixed to a hardwood stock or bar by means of a wedge. A sliding head moves on the bar, and is fixed at any desired position from the cutter by means of a wooden thumbscrew.

Its general form is seen in the illustration. It is used by grasping the stock with the left hand when marking out work, in the right hand when cutting a rebate. The method is to adjust the distance between the cutter and the face of the head, which determines the width of the rebate. The cutter is set to the requisite depth by loosening the wedge, pushing the cutter through the stock as far as needed, and firmly wedging it in place. A rebate is formed by backward and forward strokes with the gauge, cutting on the forward stroke. When one face of the work has been so cut, it is turned over, and the same procedure repeated. The cutter should be ground and sharpened in the same way as a chisel.



Cutting Gauge. How the tool is used for cutting a rebate on a piece of wood.

CUTTING-OUT. As applied to tailored clothing for men and women, cutting-out is a highly skilled trade, but the process of cutting out simple dresses, undergarments, etc., is easy with a good paper pattern to work from.

Three pairs of scissors are necessary, viz., a large, sharp pair for cutting large garments or thick cloth, a smaller pair for moderate-sized garments and silk, and also for cutting round curves, while a small pair is wanted for slots, slits, buttonholes, etc. A measuring tape is necessary for measuring the material and taking measurements of the pattern, to compare it with the size wanted, and also for measuring any straight or cross way strips that may have to be cut for frills or trimming bands.

As a rule it is easy to determine which is the right and which is the wrong side of a material. Woollen materials are generally bought folded with selvedges together, with the right side folded inside, while longcloth and similar cotton fabrics are folded with the right side out. If materials are of single width, and therefore not folded with selvedges together when bought, the right side can generally be determined, as it is smoother than the wrong side. The right side of serge, gabardine, or any cloth with a fine crossway grain can be determined by holding a length down with selvedges right and left, and one cut end under the chin. If right side is outermost, the grain should run from left down towards the right.

Some materials are woven to be made up so that a certain way hangs downwards. Thus worn, it wears longer and looks better.

This up-and-down way, is so pronounced in some fabrics that they have a bloom, which means that viewed from one end of the length the material shades lighter than it does when looked at from the opposite end. To determine the right way down of a material, lay it out flat on the table, and pass the palm of the hand first up one way then down the other. It should be smoother one way than the other, and should be made up into the garment so that the cloth smooths downwards.

Velvet and Velveteen. Materials which have an up-and-down shading or bloom are made up so that, the dark way shades down, and the darker way can be ascertained by folding the length of material to bring the two ends together, but side by side, and holding these under the chin, so that the loop hangs downwards. By looking down the stuff while it is held in this position it is easy to determine which is the darker way. It should be remembered that the smooth way down is not necessarily the dark way down too. In velvets and velveteens very often the reverse is the case, and no attention is paid to the smooth way of the stuff, for it is made up so that the dark way shades downwards, and a richer effect is obtained.

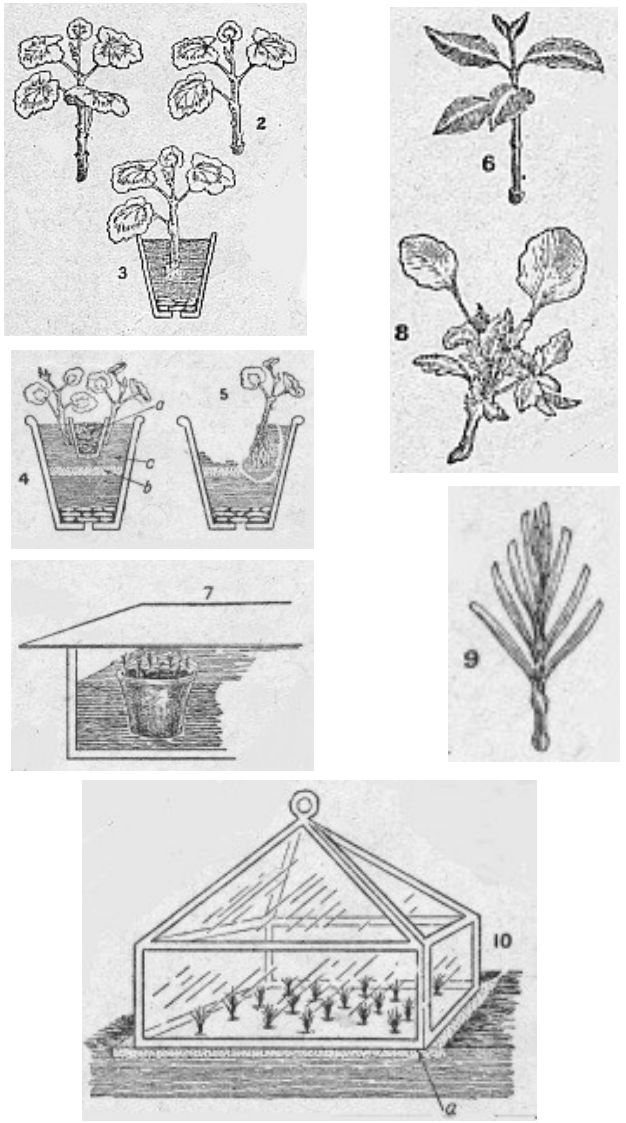
Before actually cutting out a garment, fit the pattern to the figure. Having made any necessary alterations, pin the pattern to the material firmly, so that it will not slip out of position during the cutting process. A weight is sometimes used in the case of velvet which marks easily, or needles may be substituted for pins. When cutting, cut in even strokes, so as to get a good line to the garment, and do not lift the material from the table with the scissors more than is necessary.

A piece of tailor's chalk is useful for marking cloth or dark cotton materials round the pattern edges after cutting out. When the pattern is removed from the material there are correct lines which may be placed together, the stitches taken along them, and the right amount of turnings allowed for seams is taken up. On many materials, such as light-coloured cottons or silks, for instance, chalk cannot be used. For these a tracing wheel or coloured tacking cotton is desirable.

A table large enough to take the entire length of material to be used makes cutting out simpler, as the whole pattern may be set on it at one time. The pieces may be fitted in better than they could be otherwise arranged. In paper patterns, as a rule, only one side of the garment is given. Set the pattern on double material, so that both sides of garment may be cut in one process. The double layer can be obtained by folding a piece of material to bring the selvedges together: or, if the full width of the material is necessary, owing to the large size of the pattern, by setting two full widths together. If the latter plan is followed, however, it must be ascertained that either the right sides of the two layers face one another, or else that the wrong sides face. See Dressmaking; Pattern.

CUTTINGS: For the Garden. Where seed is unobtainable or where it is desired to keep a plant true to type, propagation by means of cuttings is employed, and these are of five kinds, soft-wooded, hard-wooded, heeled, root, and leaf. The first named is generally the easiest to strike.

As a rule, a soft-wooded cutting should be severed just below a joint, and should consist of the upper part of a growing, not flowering, shoot, with three or four leaves. In some cases the wood should be young, in others half-ripe, in others quite firm. In nearly all cases the best compost for soft-wooded cuttings is loam, with about a third of leaf-mould, and enough sand to make the whole of the compost thoroughly gritty and porous. The cutting is made firm at the base by pressing it with the blunt edge of a lead pencil passed diagonally through the soil. Cuttings strike best round the edges of a pot.



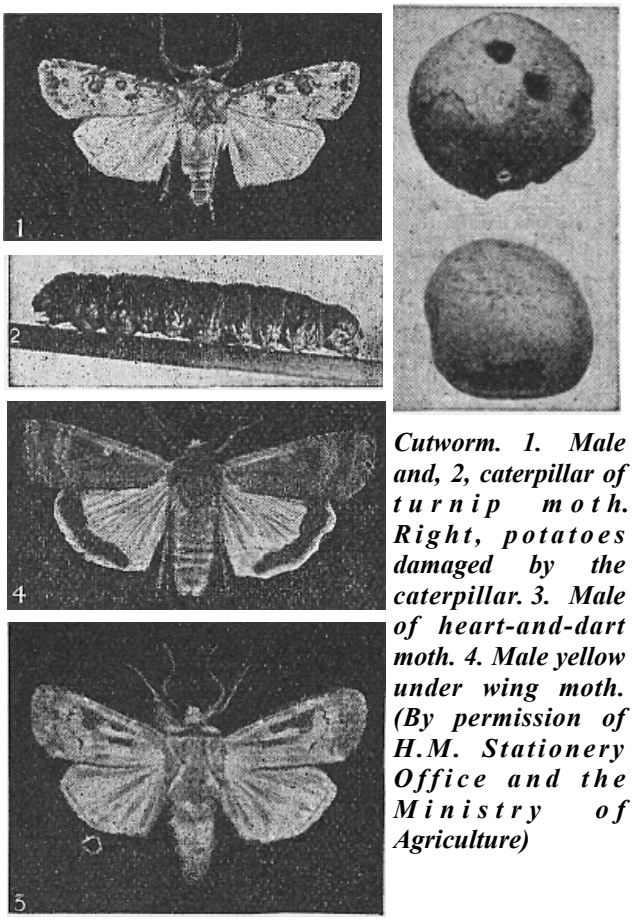
Cuttings. Diagrams illustrating typical methods of treatment. 1. Geranium, of good growth. 2. Same cutting trimmed for planting. 3. Cutting planted with sand at base. 4. How to avoid "damping off." a. Cutting planted in small pot filled with moss. b. Layer of sand. c. Soil. 5. Rooted cutting ready for potting-on. 6. Fuchsia cuttings, several of which, as in 7, are planted in a large pot and plunged into a box of ashes covered with glass. 8. Viola cutting. 9. Pink cutting. 10. Boot cuttings of anchusa starting into growth under a hand-light, a. Layer of sand.

Acacia, boronia, epacris, and erica are examples of hard-wooded cuttings. On the whole they are less reliable than the soft-wooded. In most cases the usual favourable conditions are: small pieces of the upper parts of non-flowering shoots, a compost of peat and sand, wood fairly firm and ripe, bell-glass covering. A heel is a small strip of the older wood, about an inch

long. The cutting of young wood is pulled or cut off with this strip instead of being cut clean across under a joint. Some plants root better and are less liable to damp off with than without a heel. By leaf cuttings are not meant leaves laid on the soil, but leaves with the stalk inserted. The indiarubber plant is a familiar example. They require a good deal of moist heat. Gloxinias, begonia Gloire de Lorraine, and pelargoniums generally root when thus propagated.

Evergreen shrubs are increased by cuttings placed in sandy soil in a frame in August. Leaf-losing trees and shruhs are propagated by cuttings set out of doors in October-November. Certain plants, e.g. seakale, anchusa, Japanese anemone, oriental poppy, are propagated by pieces of the root which are inserted as cuttings. *See* Apple; Gooseberry; Grafting; Raspberry.

CUTWORM. The larvae of the turnip moth, the heart-and-dart moth, the yellow underwing and others are known as cutworms or surface caterpillars, and cause much damage to cultivated plants. As a rule cutworms spend the day in the surface layer of the soil or hidden under leaves, thick grass or stones. At night they come out and feed, sometimes on the leaves of plants, but more often on their stems, both above and below ground, and are specially fond of the thick, fleshy parts of such crops as mangolds, turnips and potatoes. They also bite through the stems of plants.



Cutworm. 1. Male and, 2, caterpillar of turnip moth. Right, potatoes damaged by the caterpillar. 3. Male of heart-and-dart moth. 4. Male yellow under wing moth. (By permission of H.M. Stationery Office and the Ministry of Agriculture)

Since the caterpillars are often of the same colour as the soil on or in which they live, they are not easily seen. An examination of the crop after dark is perhaps the simplest way. They are often specially troublesome on foul, weedy land, and potatoes are likely to be attacked. When crops of potatoes or mangolds have been badly attacked it is risky to sow winter wheat unless the pests have first been destroyed.

Undoubtedly, the best method of dealing with cutworm-infested land is to run poultry upon it, and wherever this is possible it should have precedence over all other treatments. When young root crops are being attacked above ground, the plants may be sprayed with lead arsenate (1 lb. lead arsenate paste to 25 gallons water). Provided the plants are small so that the greater part of the root has yet to be made, there will be no risk of poisoning stock when the roots are finally eaten. Lead arsenate is poisonous to man and domestic animals and must be carefully used.

In allotments hand-picking is often the most simple method of dealing with the pests, which can generally be scraped out of the soil near the plants last attacked by means of a blunt knife or pointed stick. They may also be collected at night when they are feeding or crawling about on the surface of the soil. These measures are advised in Leaflet 225 issued by the Ministry of Agriculture. *See* Cabbage; Potato; etc.

CYCLAMEN: How to Grow. The Persian cyclamen is a valuable greenhouse flowering plant in full beauty in early spring. Hardy cyclamen are low-growing plants which flourish out of doors and bear small flowers in autumn and spring.



Cyclamen. The Persian cyclamen, a beautiful greenhouse plant.

The Persian cyclamen is raised from seeds sown in August in a well drained box of sifted compost of loam, leaf-mould and sand placed in a frame. When large enough the seedlings are placed singly in 3-in. flower pots, and when well rooted in those they are potted finally in 5-in. or 6-in. pots, in which they will bloom. During the winter months they should be kept in a greenhouse temperature of about 50 degrees. In the summer they thrive best on a bed of ashes in a cold frame; they need cool, moist conditions. From seeds sown in August the plants will bloom in the following February twelvemonth. When potting cyclamen care must be taken to keep the corm on the surface. Well drained pots are necessary, and a suitable compost for the final potting consists of loam, two-thirds, leaf-mould and decayed manure one-third, with a scattering of sand and crushed charcoal.

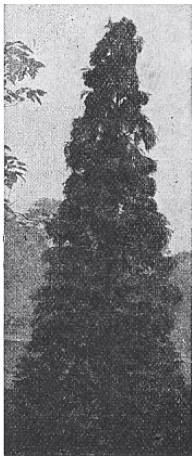
When cyclamens have finished flowering they should be dried off by gradually giving less water. When the leaves have fallen the soil must be kept dry and the pots placed in a sunny greenhouse or frame. Late in July the corms should be taken out of the soil, repotted in fresh compost, watered and set in a frame. They will soon start into fresh growth. These plants are long lived and may be kept for many years. They are often grown successfully as window plants. There are many varieties, with flowers in crimson, rose, salmon, and other colours.

Hardy cyclamen should be planted out of doors in well drained soil with which leaf-mould and mortar rubble have been mixed freely: they like slight shade. The corms need only a slight covering of soil except those of Cyclamen neapolitanum and africanum, which should be set an inch or so deep. Some of the chief kinds are: africanum, reddish flowers, September; coum, rose-red, April; europaeum, rose, August; ibericum, rose-red, March; neapolitanum (hederaefolium), reddish, September; repandum, reddish, spring. The corms of the autumn flowering cyclamen are planted in July-August: the others in September. Pron. Sik-la-men.

CYCLE. Both a tricycle and a bicycle are called a cycle, while cycle shed and bicycle shed are interchangeable terms. *See* Bicycle; Motor Cycle; Tricycle.

Cycle Car. *See* Three-Wheeled Car.

CYMBIDIUM. A beautiful winter and spring-flowering orchid of which innumerable new varieties have been raised in recent years. The flowers, in shades of rose, buff, pink, and green on long arching spikes, are most decorative. They are vigorous plants and are grown in pots in a mixture of loam and peat with sand. They thrive in the intermediate house in which a minimum temperature of 55—60 degrees is maintained. Pron. Sim-bid'i-um.



Cypress. A favourite conifer, Cupressus lawsoniana.

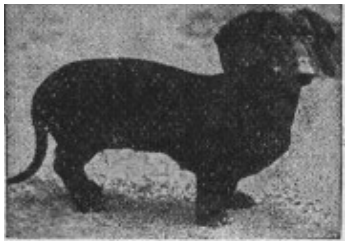
CYPRESS. The cypress is a graceful evergreen conifer of which there are many species, some of them are ideal lawn trees. They flourish best in moist districts in deep loamy soil; they are less satisfactory in gardens near large towns where the air is impure, or on very chalky land. One of the chief species is Cupressus lawsoniana, of which there are many varieties, e.g. lutea and Stewartii, with yellow leaves, Silver Queen, with silvery-green leaves, and gracilis pendula of drooping growth. Cupressus macrocarpa is a beautifu1 quick-growing conifer and its yellow leaved variety lutea is attractive; both these are better suited to comparatively mild than cold districts. Sempervirens, of distinct columnar growth, so conspicuous in Italian gardens, is less hardy than others.

DAB: The Fish. This small flat fish of the flounder species, seasonable all the year, is found in abundance round the coast of Great Britain. To fry, the dab should be cleansed, well dried, and rubbed with salt an hour or two before cooking, and dipped into egg or milk and breadcrumbs. It should then be garnished with fried parsley.

To boil a dab sufficient water is needed to cover the fish, a little salt and vinegar being added. About 10 min. is the time required, and any fish sauce can be served.

DACE. A fresh-water fish, resembling the roach, found in abundance in English streams. The flesh is somewhat coarse but it can be fried or boiled.

DACHSHUND. In spite of his unprepossessing appearance, the dachshund has a high reputation as a domestic pet, being affectionate in disposition, a splendid playmate for young children, and a good watchdog. A1though not used for sport in Great Britain, his German name, signifying badger-dog, indicates the purpose for which originally he was bred.



Dachshund, a short-haired breed of German dog.

The body of the dachshund is exceedingly long, and the legs very short, the front pair crooked. The long head tapers to the sharp muzzle, and the ample ears hang flat beside the cheeks. The tapering tail of the animal is carried with a rather low curve. The type usually seen in Great Britain has a short, close coat which may be some tint of red, black, brown, or grey, or a combination of two colours. There are also long-haired and rough-haired breeds. *See* Dog.

Daddy Long Legs. This is the popular name applied to several of the larger kinds of crane flies. *See* Crane Fly.

DADO: For Decoration. Where there is a dado there should not be a frieze is a rule which holds good in average homes, but occasionally both are seen in the case of exceptionally large and lofty rooms, or on a staircase where there exists a wide expanse of wall between the stairs and the ceiling.

The dado, which may be described as a decorated space between a base consisting of a skirting and a moulding, may be of one of various materials. About 3 ft. to 4 ft. 6 in. is an ordinary depth from the floor to

(Continued in page 605)



'C' RECIPES. A SELECTION SHOWN IN ACTUAL COLOUR

Canterbury Pudding. Put slices of stale sponge cake in a buttered mould in layers, each sprinkled with castor sugar and cinnamon. Beat up 3 eggs and strain into ½ pt. milk. Pour into basin and leave to soak. Steam gently. Serve quickly with fruit or sweet sauce. Carrot Cheesecake. Any good pastry filled with 4 oz. boiled carrots (yellow centres only), rubbed through sieve, mixed with 1 oz. warmed butter, 1 tablespoonful each of currants and spongecake crumbs, 2 of castor sugar, grated lemon-rind, a little grated nutmeg, and a well-beaten egg. Serve hot.



'C' RECIPES: A FURTHER SELECTION SHOWN IN ACTUAL COLOUR

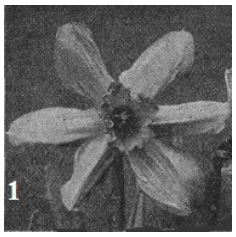
Crepinettes. Savoury mince baked or fried inside strips of pig's caul and served on spinach or other green vegetable. Remains of fowl, veal or lamb may be used. Egg and breadcrumb and then fry or bake. Cornflour Muffins—to make: ½ lb. each of wheaten flour and cornflour, 2 oz. each of melted butter and castor sugar, 2 teaspoonfuls baking-powder, ¾ pt. warm milk and 2 eggs. For method of cooking, see under Muffin. Coconut Kisses: made like Coconut Ice, but shaped like rock cakes. Cumberland Pudding: 6 oz. each of breadcrumbs, suet, sugar, chopped apple and sultanas or currants. A little candied peel and nutmeg and finely chopped peel of 1 lemon; 6 beaten eggs mixed with other ingredients. Put into mould, cover with cloth and boil 3 hr. Serve with white sauce (made with water] flavoured with sugar, nutmeg, lemon-juice, and a little sherry or brandy.

the dado-moulding. The dado has a tendency to cut the height of a room, especially when there is marked contrast in colour or tone between it and the rest of the walls. Panelled wood is used in oak colour for staircase, hall and lounge, and is a saving precaution against dirty marks on light-coloured walls, where there are children. Hand-made Japanese embossed leather papers make a substitute for such panelling. They are good in colour, and durable, being impervious to the action of smoke and gas.

Decoration for rooms in Adam or Queen Anne styles utilizes the dado in wooden panelling, while above the dado rail the walls are painted and mouldings applied to simulate the big panels of those periods.

A tiled dado is clean and labour-saving in kitchen or bathroom. *See* Anaglypta; Decoration; Moulding.

DAFFODIL. The best hardy spring-flowering bulb, suitable for planting in flower beds and borders, in grass and for cultivation in pots in the greenhouse and in bowls indoors. Forced bulbs will bloom in January and a succession of flowers can be maintained until March, when the earliest of those out of doors come into bloom.

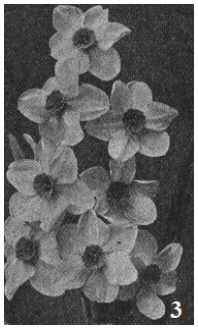




Daffodil. 1. Chalice-cupped Sir Watkin. 2. King Alfred.

Daffodil is the popular name of the trumpet variety of narcissus, such as Emperor and Empress. A modern classification describes ten groups of narcissus. The classification is based on the comparative length of the outer or perianth segments and that of the central part, which is variously described as trumpet, cup or crown according to its length. The chief classes are as follows:

Trumpet daffodils, in which the trumpet or crown is as long as or longer than the segments of the perianth. Favourite yellow varieties are Emperor, Golden Spur, Lord Roberts, King Alfred and Maximus. White varieties are Madame de Graaff, Peter Barr, Beersheba, Alice Knight, and W. P. Milner. Others with white perianth and yellow trumpet (called bicolors) are Horsfieldii, Empress, Weardale Perfection and J. B. M. Camm.

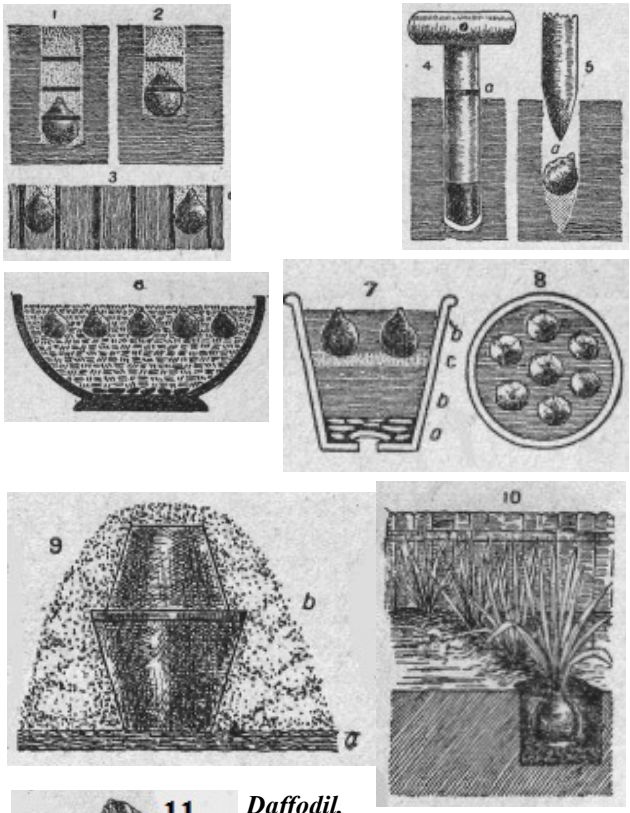




3.Poeticus narcissus. 4. Variety known as the Hoop Petticoat daffodil.

Chalice Cupped or Incomparabilis: the cup or crown is not less than one-third the length of the perianth segments. A few good varieties are Sir Watkin, Gloria Mundi and Blackwell.

Star, Barri or Short Cupped: the cup or crown is less than one-third the length of the perianth segments; the perianth is yellow or white and the cup is coloured. Favourite varieties of this type of daffodil are Barrii conspicuus, Red Beacon and Red Chief.



Daffodil. Diagram showing how the bulb should be grown. 1 and 2. Relative depths to plant in light and heavy soil. 3. Distances apart for planting. 4. Dibber, with depth for planting marked at a. 5. Unsuitability of pointed dibber, which leaves water pocket below bulb, a. 6. Bulbs planted in fibre. 7. Pot culture: a, drainage; b, soil; c, sand, and 8. How to place bulbs. 9. Pot, covered with another, buried in fine ashes b, on cinders, a. 10. After flowering, bulbs are placed in a trench until foliage is dead. 11. A good type of bulb.

Eucharis-flowered or Leedsii: distinguished from the star narcissi by having a white perianth and white or pale cup or crown. Duchess of Westminster, Mrs. Langtry, Maid of Athens, and Snowsprite are typical ones.

The remaining groups consist of varieties of Narcissus triandrus, cyclamineus (both of these are miniature kinds), jonquil, the bunch-flowered Narcissus tazetta, Poet's Narcissus and the double narcissi.

Daffodils never look better than when grouped in grass; the bulbs are planted in September-October

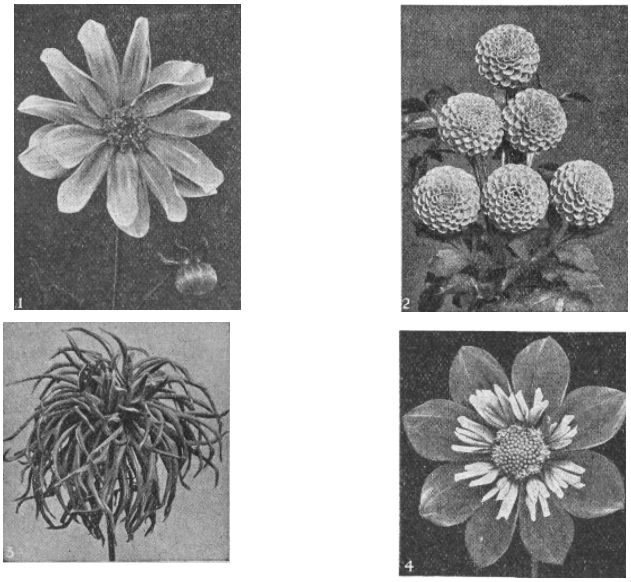
about 3 inches deep. Suitable varieties for this purpose are Emperor, Empress, Pallidus praecox, Barrii conspicuus, Mrs. Langtry and Sir Watkin. For planting in formal flower beds Emperor, King Alfred, Empress and innumerable others are used.

The miniature hoop petticoat daffodil (bulbocodium), cyclamen-flowered (cyclamineus), angel's tears (triandrus), are suitable for the rock garden; they need well-drained soil.

Varieties for cultivation in flower pots under glass to supply early blooms are Golden Spur, Horsfieldii, maximus, Victoria, jonquil, W. P. Milner and the bunch-flowered or poetaz varieties. The bulbs should be potted early in September, placed under old ashes out of doors for 6 weeks and then brought under glass, a few at a time, to provide a succession of bloom.

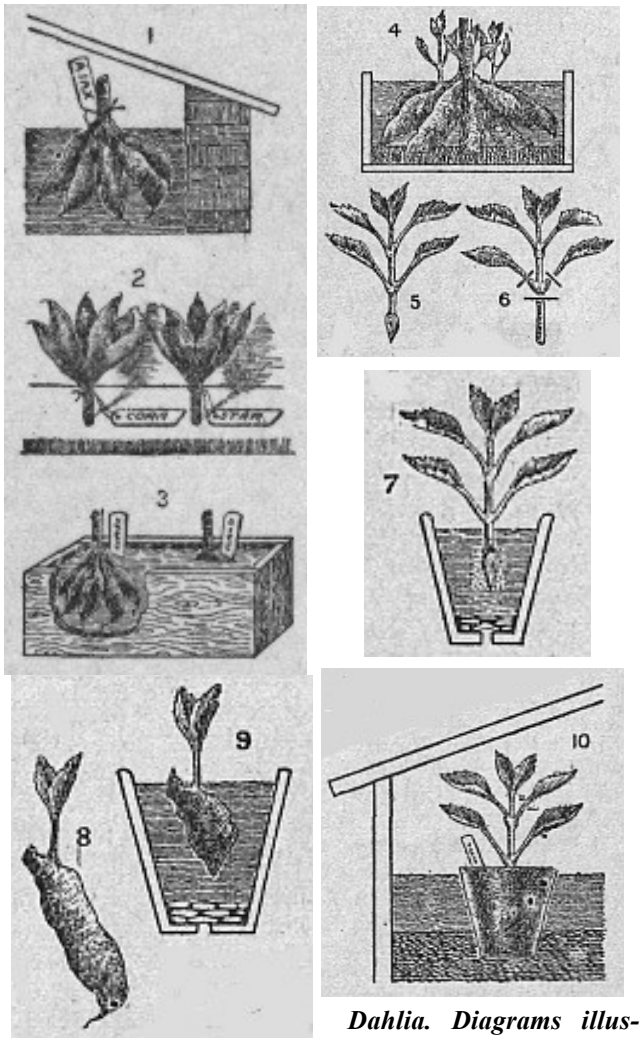
Daffodil Pests. Two main troubles afflict daffodils. First, there is the narcissus fly, which lays eggs on the leaves in May and June, and the grubs that hatch eat out the heart of the bulbs. The flies resemble small dark humble-bees, but being true flies have only two wings and have no visible antennae on their heads. They should be netted on bright sunny days. The bulbs should be examined at lifting time, and gently pinched; if soft they should be cut open and the grub destroyed. The other disease has been proved to be due to eelworm, which, in addition, is particularly troublesome in connexion with cucumbers and similar plants. See Bulb; Cucumber; Flower Garden.

DAHLIA. There are many types of dahlia, and some are more useful for garden decoration than others. Those chiefly to be recommended for this purpose are the star, charm or dwarf peony-flowered, mignon, decorative, collarette, tall peony-flowered, single and some of the cactus varieties. Other types are the show, pompon and fancy.



Dahlia.1. Sapho, a single variety.
2. A characte-ristic show dahlia.
3. Yeoman, cactus dahlia.
4. Patrol, a collarette variety.

The tubers of the dahlia are not hardy, therefore they must be lifted as soon as the tops of the plants have been cut down by frost and stored in a frost-proof place for the winter. They keep well in boxes of soil or sand. In April the old tubers may be planted out of doors; thev provide a profusion of bloom. Finer flowers are obtained by starting the tubers into growth under glass in February and taking cuttings from the young shoots. These are inserted in pots of sandy soil; after having been hardened off in May they are planted out of doors early in June. Dahlias may also be raised from seeds sown in a heated greenhouse in January-February; they will bloom late in the summer. There are innumerable varieties of the types referred to above, and fresh ones are introduced annually. They are described in catalogues.



Dahlia. Diagrams illustrating methods of culture. 1.Root in frame. 2. Roots drying on shelf. 3. Roots in box, kept from frost. 4. Sprouting tubers, for cuttings. 5 and 6. Types of cuttings, ready for potting, as in 7. 8. Sprouting tuber. 9. Same cut to fit pot. 10. Potted cutting in frame, for rooting.

Dahlias need deeply dug and manured soil, a sunny position and full room for development. They must be staked carefully, for the shoots are brittle. The best display is assured by removing many of the side shoots.

DAIRY. To fit up a small dairy is by no means a difficult matter. A building can often be altered to fulfil the necessary conditions, such as a shed about 15 ft. by 12 ft. It should be situated at a sufficient distance from the cowshed, the dungheap, or other source of contamination. The aspect should be northern, if possible, as this keeps the dairy cooler during the hot weather. The entrance to the room should be from the open air, and not from the cowshed or other farm building, and the room should be used for no other purpose than for the treatment of the milk. A separate room is desirable for the washing up of the utensils, and this is arranged quite easily by putting up a thin partition.

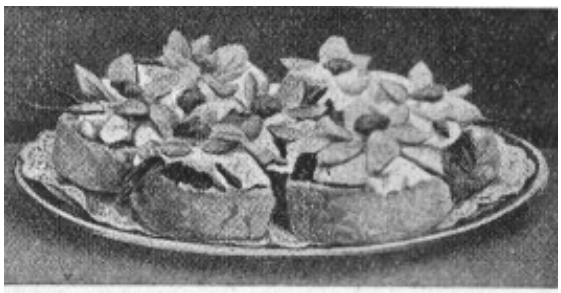
Windows that will open can be placed on one or more sides of the dairy, as ample light is highly desirable. Fine wire gauze or similar material can be fixed outside the windows to keep out insects, while allowing air to circulate freely The dairy should be provided with ventilators, preferably both below and above, in the walls. The walls should be smooth, which can be accomplished by cementing the interior; they can be either washed down frequently, or, better still, they can be lime washed. The roof should be easily cleaned. There should be no inside drains, but the floor should be made with a slight fall, 1 in. in 8 ft., towards a gutter at the side of the wall, and an outlet through the wall should lead to a properly trapped gully outside. The best material for the floor is cement.

In a small dairy a copper should be placed in the washing-up room, and there should also be a washing-up sink. The copper can be adapted for sterilizing purposes by boring a hole through the centre of a wooden lid and fitting a plug in. The steam from a properly boiling copper is sufficient to sterilize the utensils in 5 min. Pails and churns can be sterilized by inverting them over the opening in the lid, and smaller articles by placing them in a steamer, which may be improvised by using the receiver of a milk cooler or separator, placing it over the opening and covering it up with a thick cloth,. Alternatively all the utensils can be put into boiling water for several minutes.

After use, all utensils should be rinsed with cold water as soon as possible, thoroughly scrubbed inside and out with hot water, and then scalded or steamed and inverted on a rack provided for the purpose. Floors should be washed and scrubbed with a brush, swilled with boiling water, and dried with a cloth or squeegee. *See* Butter. Cheese; Churn; Cream; Milk, etc.

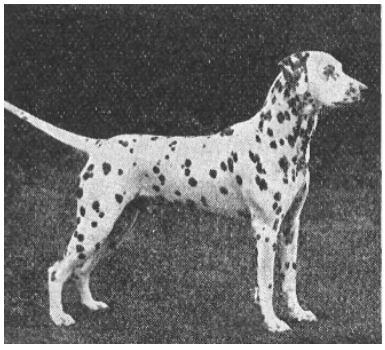
DAISY. The named varieties are showy flowers for spring beds. Rob Roy, Alice, Dresden China, and Pink Beauty are favourites. For giant double daisies sow seeds in June. The seedlings are put on a reserve border and planted finally in autumn. They should be lifted and divided after flowering; the pieces are grown on a reserve border during the summer. The variety popularly termed the hen-and-chickens daisy has the peculiarity of forming small flowers round a large central bloom.

DAISY CREAMS. To make these, cut a fresh Swiss roll weighing 1 lb. into slices about ½ in thick. Prepare ½ pint jelly in the usual way, then chop it rather finely and put a heap of it on each slice. Whip ¼ pint cream and mix it lightly with a stiffly-whipped white of egg. With this the jelly should be covered. Then blanch 1 oz. of sweet almonds, splitting each in half lengthways, and cut 2 or 3 candied apricots into small, thin rounds, each about the size of a threepenny piece. Soak a little angelica in warm water till it is soft, then cut out from it a number of diamond shapes to represent leaves. On the top of each sweet put a daisy formed from the halved almonds, using these as petals, and a round of apricot for the yellow centre. The angelica should be arranged to form stalks and leaves.



Daisy Creams, an attractive sweet.

DALMATIAN. In certain respects the Da1matian dog resembles a spotted pointer, and from the numerous dark spots on his white coat he has been called the plum pudding or spotted dog. He is usually very clean-built, strong, and agile, with straight legs and feet, powerful loins, deep chest, and nicely-moulded neck, the short coat, sleek, glossy, and easily groomed. Weighing about 55 lb. on the average, the Dalmatian is of medium size, and not too big for an indoor companion. He is not noisy, seldom barking when it is not his duty to do so; but if he does bark, his deep voice is an effectual warning to strangers. In choosing one, remember that the markings may be either black or liver-coloured on a brilliant white ground. Experts insist upon the spots being clearly defined, without touching one another, and in proportions they may vary from that of a sixpence to a florin. They should be pure in colour, not having any white hairs mixed with them. The dog is hardy, easily kept in condition, and an excellent breed in every respect. *See* Dog.



Dalmatian Dog, a large breed of carriage dog, also known as the plum pudding dog, a powerful, agile and companionable breed.

DAMAGES: The Law. Anyone who breaks a contract or who by his trespass, or nuisance, or negligence causes injury to another in person or property must pay damages. In some classes of cases, e.g. libel or slander, the damages awarded may be punitive or exemplary; that is to say, they bear no relation to any monetary loss sustained by the person aggrieved.

The same is true in claims for assault or breach of promise. But in most cases the damages to be awarded are such a sum as will make up to the individual the actual loss sustained by reason of the wrong or the breach of contract. In the case of personal injuries, a man may claim what it has cost him for doctor's fees, special food, the cost of a holiday to recuperate, earnings lost, and, in addition, a fair sum for the pain and suffering he has undergone, and for any permanent injury.

When a husband, wife, child, father, or mother is killed by somebody's negligence, or otherwise, under such circumstances that if he or she had only been injured and not killed, an action for damages could have been brought against the wrongdoer, the widow, children, widower, or either parent, can recover damages proportionate to the pecuniary loss sustained. In addition, the personal representatives of the deceased can recover damages for the death. These damages will include a sum in compensation for the shortening of the life of the deceased. Nothing is allowed for injured feelings.

A person breaking a contract is liable to pay some damages, even though the other party has suffered no loss; but these may only be nominal—a few shillings. But the other party to the contract can also recover any pecuniary damage for any loss which was the natural and reasonable and direct result of the breach of contract. If anyone agrees to supply goods and does not send them, the buyer is entitled to purchase them elsewhere, and if he has to pay a higher price, he can claim the difference. If a householder orders work by a tradesman at a price, and the work is badly done, the householder is entitled to have it put right by another man and claim from the first man as damages what he had to pay to the second *See* Accidents; Contract; Employer's Liability; Servant.

DAMASK: The Fabric. There are linen, cotton, silk and wool damasks, and the feature common to them all is the method of construction. The patterns are usually large and floral, and are formed of satin-like twills in reversed directions.

Damasks are made more for household and furnishing purposes than for dress. Silk damasks made for church use have stood for centuries. Victorian worsted damasks, used as winter window curtains, and tablecloths, have, in many instances, stood 50 years of wear with little harm. There are two kinds of linen table damask known as double and single damask. The latter has the stronger weave. Cotton damask tablecloths are made in the same patterns as linens, but they lack firmness and brightness.

DAMASK ROSE. A very old type of rose, said to have been introduced into Great Britain in the 16th century. Damask roses do well as dwarfs, but are not suitable for growing as standards. They require generous cultivation, and all their weak growth should be thinned out in March or April, leaving strong shoots pruned to about one-fourth their length.

Several varieties are obtainable, among the best being: Lady Curzon, large single pink; Crimson Damask, bright crimson; York and Lancaster, white, striped red; Old Rose Damask, red. The Damask rose is largely used abroad for the purpose of making attar of roses. *See* Rose.

Dame's Violet. *See* Rocket.

DAMP: Precautions Against. Excess of moisture or damp may be present in the soil, the dwelling, the atmosphere, or the clothing, and so affect health. A cold, damp climate, dwelling or workshop favours the development of rheumatism and chest complaints, including consumption. Sitting in damp clothes predisposes to chills.

In the house damp needs to be carefully guarded against, and during the winter no room containing a piano or any other musical instrument, valuable pictures, or furniture that is heavily padded, should be left long without a fire. If the drawing room is not used daily, a fire should be lighted in it once or twice a week. Pictures that have been hanging on a damp wall should be taken down, the moisture wiped off with a clean duster, and then placed with their faces to the wall in a warm room. Furniture or perishable articles which are being stored in a cellar should be placed on battens and should not be pushed close against a wall.

Beds left unoccupied for several days can be kept free from damp if hot-water bottles are placed between the sheets at frequent intervals. This obviates the need for removing the bedding and airing it before the fire. Damp in beds can be detected by placing a mirror in the bedclothes. If it remains unclouded, the bed is dry enough to be slept in. If damp cupboards are sprinkled with quicklime and then left for two or three days, the moisture will be absorbed.

Damp in Walls. The cause of damp in the house is not always easy to discover at first, although the general position of the trouble will often indicate its probable source. For instance, if the wet patch is at or near the top of the room, and a gutter is just outside, the gutter will probably be found to have got choked up with leaves and rubbish, thus impeding the free flow of the water, and causing it to overflow. It may do this on the wall side of the gutter, when the dampness will appear near the top of the room, or it may overflow on the outer side of the gutter, and be driven by the wind on to the wall at a considerable distance away.

Another cause of dampness is the failure of the gutter brackets, which may work loose and sag down, or even be broken off altogether. The trouble will probably disappear when the slack brackets are

wedged and cemented up, or rescrewed to woodwork. Care must be taken to see that the guttering has a sufficient and regular fall. Should a section of gutter sag bodily, it will cause a pocket in which water will accumulate when a heavy rainstorm puts extra pressure on the gutters.

Some old-fashioned houses with curb roofs, those with a mansard roof, or a brick or masonry parapet, have inconveniently arranged internal gutterings, generally made or covered with sheet lead or zinc. These either perish with age or, more frequently, are punctured by falling matter, or the passage of someone wearing hobnailed boots. When dealing with this class of gutter, always wear felt slippers or something soft, such as a rubber golosh over the boots, or take care to walk on duck boards laid down for the purpose.

Holes are very difficult to locate in such gutters; the only thing to do is to brush or clean all suspected parts, and persevere until the perforation is found. It can then be repaired by means of a wiped joint, a new section can be laid, or a temporary repair effected by applying one of the many compounds sold for the purpose of rendering leaky roofs watertight.

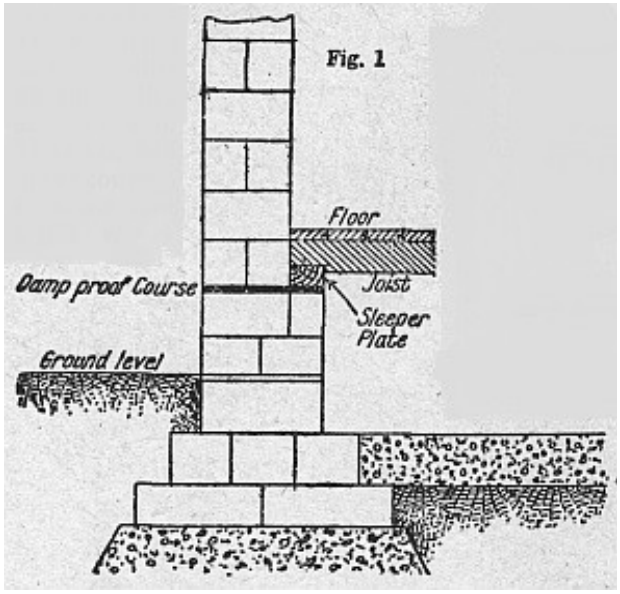
Damaged slates and tiles are obvious causes of dampness; but it does not follow that a damp place on a wall is necessarily made because a tile is missing immediately above it. A displaced tile may allow rain to drive in, or, worse still, to flow in by convection; it may then drip off on to, say, a rafter, and run down the rafter for a distance of several feet before it finally drips on to the wall. Generally, however, it is the tiles at the eaves that should be suspected; all those that are damaged must be replaced, or the cracks and holes made good with cement, mortar, or slurry. The rain-water heads and down-pipes may be choked with debris, and causea damp places on the wall, the plain remedy being to clear away all obstructions.

Treatment of Porous Bricks. When a house has been built with inferior or porous bricks, the wet may drive through the wall. The cure is by rendering with cement mortar, rough casting, or by a coat of one of the waterproof compositions. A waterproofer known as Pudlo may be added to the cement used for rendering a damp wall. This preparation is mixed with the cement in the proportion of one part in twenty, in the dry state, before the cement is added to the sand. A preparation of emulsified paraffin wax, painted or sprayed on to walls in warm, dry weather, will fill up the pores, and render them impervious to damp. Sold under the name of Sprawax, this can be obtained from ironmongers and builders' merchants. It is also available for inside work. Another method is to apply two or three coats of silicate petrifying liquid to the outside wall.

Besides dampness due to falling water and driving rain, another cause of trouble is found in defective damp courses, which allow the wet to rise upwards by suction in the bricks or by convection. In addition there are purely local causes, such as a burst waterpipe or an unexpected flood in the district. Treatment must be determined by circumstances. First ascertain that there is a damp course by examination of the lower courses of brickwork. If there is, and the defective spot can be located, it can be remedied by removing the brick course above and below the damp course, and resetting a new one.

An additional precaution in houses situated in a damp locality is to provide adequate surface drainage. This ensures that the land in the vicinity is relieved of all surplus water, and any chance of sodden or waterlogged ground eliminated. *See* Cottage; Gutter; House; Roof, etc.

DAMP COURSE. This is a layer of impermeable material built into all walls to prevent the damp from rising out of the earth. Suitable materials for use comprise slates, sheet lead, asphalt, or bitumen.



Damp Course. Fig. 1 illustrates the arrangement of a simple horizontal damp-proof course.

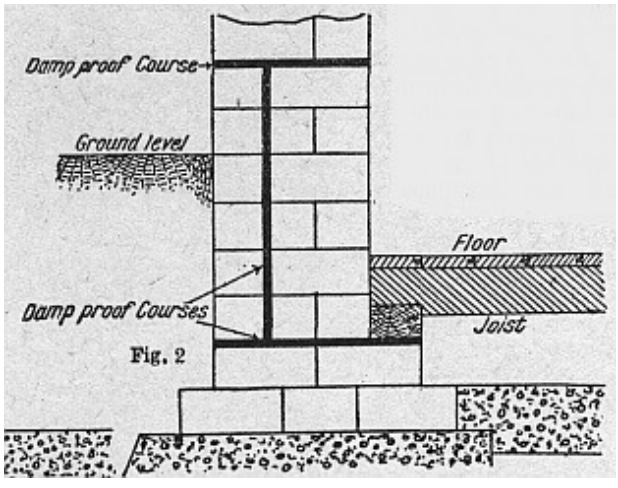


Fig. 2 shows various courses for a floor beneath the ground level.

In all probability slates are cheapest and best in the long run. They are purchased in convenient sizes and known as D.C. slates, generally measuring 18 in. long and 9 in. wide for the ordinary 9 in. wall. They are laid in two courses, breaking joint and well bedded in

cement mortar. Asphalt and bitumen damp coursing is generally used in the form of long sheets, the end of one sheet overlapping that of the next. It should be laid on a bed of cement mortar floated off smooth, and care taken that the material is not punctured or torn while being laid. It is advisable to use only the best quality. Tarred roofing felt, which is sometimes employed as a damp coursing, is an inadequate protection for the walls of a building.

Horizontal damp courses of all kinds must be laid on walls, piers, chimney breasts, sleeper and fender walls; they must cover the full width and be laid beneath the lowest timbers, and at a height not exceeding 12 in. nor less than 6 in. above the ground. Fig. 1 shows a simple horizontal damp course. When the floor level is below the ground level, three damp courses are needed—first a damp course 6 in. above the ground level; secondly, one below the wood sleeper plates of the lowest floor, and the third is a vertical damp course connecting the others, thus preventing any possible passage of dampness (Fig. 2).

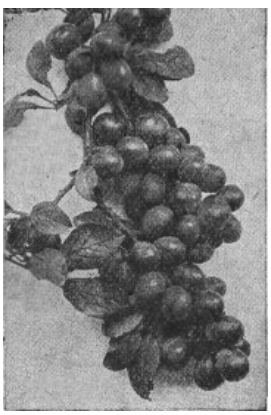
Damp courses may also be necessary in or near the top of walls to prevent rain water working downwards, as for example a garden wall that abuts on the house. Slate damp courses are laid in chimney stacks at the point where they rise above the roof, for the same reason. *See* Air Brick; Architecture; Brick; Bungalow; House; Wall, etc.

Damper. *See* Range; Stove.

DAMPING-OFF. In gardening this term is commonly applied to the premature decay of seedlings, cuttings and tender plants. It is caused by a fungus disease which in the main is the result of overcrowding and careless watering. Seedlings should be watered by immersing the flower pot almost to the rim for a few minutes in a vessel of water.

DAMSON: Tree and Fruit. Being very hardy, the damson thrives in bleak places, and does not suffer from strong winds to the same extent as most other cultivated fruits. It is consequently often planted on the outsides of plantations, generally as a standard.

The treatment advised for plums quite suits the damson. It succeeds in most fertile soils, but best in ground containing lime. After the trees have been shortened once, or perhaps twice, in their early days, they require practically no pruning. Propagation is generally by budding and grafting on to plum stocks. The best varieties are the Merry-weather, Bradley's King, Shropshire Prune, and Farleigh Prolific.



Damson. Fruit of Farleigh, one of the best varieties.

How to Cook. The small purple fruit improves with cooking, but requires plenty of sugar to be cooked with it. Sugar added after the damsons are cooked will not remove the acidity. To stew damsons, pick over and rinse 1 lb., and simmer them in a stewpan with 3 heaped tablespoonfuls sugar and a breakfastcupful of water. If the damsons are first slit with a knife they will cook more quickly. Any stones rising to the top should be removed. The flavour will be improved if apples are mixed with them, ½ lb. apples to 1 lb. damsons.

Damsons are excellent when prepared in this manner for flans, tartlets and pies. A damson pudding is made in a similar way to other fruit puddings. Line the basin with a suet crust, and fill it with sound damsons, or damsons and apples, and sugar. Two pounds of fruit will need five tablespoonfuls of sugar and a teacupful of water. Cover the basin with a round of the crust, tie over it a scalded, floured pudding-cloth, and steam it for 3-3 ½ hours.

Damson Preserves. Damsons make good preserves. The following is a recipe for making damson jam without stones: Take 8 lb. ripe damsons, and boil them in a stewpan with a very little water until tender. Strain them through a coarse sieve to remove the stones, and add to the pulp 6 lb. preserving sugar. Let the whole boil until a little of the jam will set when dropped on a plate, then pour it into dry, warmed jars and cover at once.

The following alternative recipe is given with apples, which should be used in either case as desired. Split open 6 lb. ripe damsons, and put them in a stewpan with ½ pt. water and 3 lb. peeled and chopped apples.

Stew them for half an hour or more, stirring frequently, and removing any stones that separate from the fruit. Then add 8 lb. of sugar and continue the process until the jam is done.

A very stiff jelly made with damsons is known as Damson Cheese, and eaten as a preserve. To make it, pick over some sound, ripe damsons, and put them in a covered jar in a saucepan of cold water. Bring the water to the boil, and let it boil for 2—3 hours, re-plenishing it with more hot water as it boils away. When the damsons are tender, remove them from the juice and strain them through a coarse sieve to get rid of stones and skins.

Weigh the pulp, and add sugar in the proportion of ½ lb. or more to every lb. of pulp. Put this, with the juice, into an enamelled pan, and let it boil fast, stirring frequently, until it becomes a stiff paste, so stiff that it will leave the pan clean when it sticks to the spoon. Have ready some shallow, buttered moulds—odd saucers will do—and pour the cheese quickly into them. If covered with jam paper when cold it will keep well.

DANCE: How to Give. One of the most popular entertainments that a hostess can give is a dance. If a very big dance or ball is given, a large number of invitations are sent out, an elaborate supper is offered,

the floral decorations are on a grand scale, and bands provide the music for dancing.

Such a dance can only be given in a house with very large rooms, and it is generally necessary to hire a hall or assembly rooms. Many hotels have a suite of rooms kept for the purpose, and when a dance is given the hostess can lessen her responsibilities by leaving the lighting, decoration and arrangement of the rooms to be done by the hotel.

In the hostess' own house the refreshment arrangements can be entrusted to a firm of caterers, who make a fixed charge per head and take the whole responsibility of seeing that the food, service, and general details are suitable and adequate. There are many hostesses who feel that, provided their house is large enough, nothing is really more enjoyable than a private dance given in a private house, and they do not mind the trouble it entails.

The largest room is set apart for dancing. It should be completely emptied, and where there is parquet flooring covered with rugs it is an easy matter to roll up and put aside the latter and polish the floor until it provides a good surface for dancing. The lighting arrangements must be adequate, for the gaiety of a dance does to some extent depend on the brilliancy of the scene. At a New Year dance a feature in the programme may be a 'Twilight' dance, during which lights are switched off, with the exception of coloured electric bulbs in the evergreen decorations.

Besides the room set apart for dancing, suitable provision must be made for sitting out and for cloak-room accommodation. If people who do not dance are also asked, it is a good plan to arrange for bridge to be played in another room. There may be a band, or several musicians; though a good gramophone is often successfully used for a small dance in a private house.

The invitations are sent out two or three weeks beforehand, and, if the dance is very small, may take the form of a little note. For larger dances, printed at-home cards are used, with the time the guests are expected and the word dancing written at the bottom right-hand corner of the card. It is usual for girls only to be invited with a partner. This arrangement saves the hostess much trouble.

A Cinderella dance ends at 12 o'clock, begins at 9, and supper would be served at 10.30. Other dances may be carried on to the small hours of the morning. A cotillon may be introduced, but this calls on the hostess for presents or the distribution of favours. Just before the guests depart it is usual to offer each a cup of hot soup or coffee.

DANCING: ITS FUNDAMENTAL PRINCIPLES

Some Modern Ideas on an Ancient Art

In addition to this general article, our Encyclopedia has entries on the various dances, e.g. Fox Trot; Quick Step; Waltz. See also the preceding article on Dance.

Correct ballroom dancing is one of the most beneficial of pastimes, it uses the muscles in a natural manner and is conducive to preserving a good figure. But the form of dancing must be correct, balance and ease of movement being essential.

Formerly far fewer muscles were used, and dancing was done almost always on the ball of the foot. This last was a most injurious practice, not only because of the unnatural strain on the leg muscles, but on the big toe joint as well, causing in many cases the malformation of the joint. Now the heel comes into play and the ankle is used naturally as in walking; in fact all modern ballroom dancing is based on natural movement. A good teacher endeavours to make a pupil dance as naturally and comfortably as he or she walks; and to a certain degree adapts the steps, or rather the size and manner of the steps, to the habitual walk of the pupil, providing, of course, that it is a good walk. Therefore anything in dancing that seems uncomfortable and awkward for the person to perform must be wrong, whether the fault is on the side of the girl following or the man leading.





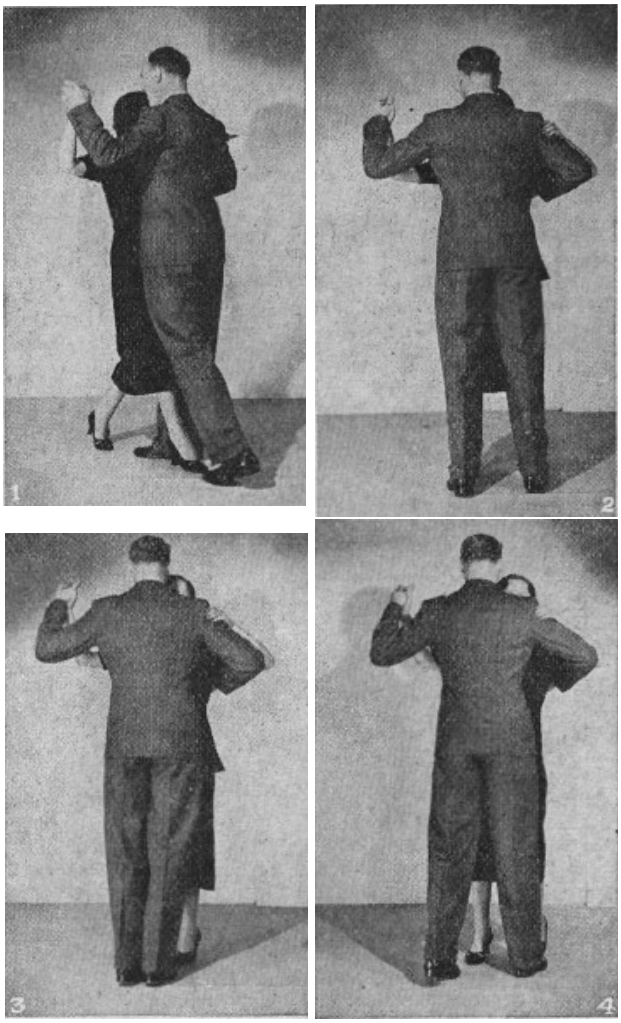
Dancing in action: the correct hold. Left: the woman's hand is placed just below the man's shoulder, the fingers resting gracefully but naturally. Right: the correct position for the man's hand, just above the small of his partner's back. (Courtesy of "The Dancing Times")

Before taking up dancing it is an excellent plan for anyone to make sure that his walk is correct. The back should be straight and the stride coming from the hips; feet should be neither turned out nor in, and should be close together when one foot passes the other, as close as if walking on a plank.

Basic Movements. Dancing, like any other sport or pastime, has its rules, etiquette and technique, and if the basic movements are learned correctly in the beginning more complicated movements are easily performed later. The person who has thoroughly mastered the groundwork can learn a series of new steps in a quarter the time it takes a person who has never learnt the basic movements, but dances "naturally." This applies to any dance, whether it is one of the established dances such as the waltz and slow fox trot, or the new and short-lived crazes that come and go during the dancing season.

The movement is always from the hips, the legs swinging like a pendulum. The girl and man should both stand erect and naturally, the girl resting her left hand along her partner's right arm near the shoulder, the man holding her firmly, but without strain or

effort, just under her left shoulder blade, his left arm held so that his hand is on a level with his ear. One of the chief faults seen in the man's hold is that he clamps his arms from shoulder to elbow to his body, instead of holding them easily in a nice straight line from the shoulder.



Dancing: the Quarter Turn. A useful step for the occasional dancer. First movement: right foot forward, turning on it to right; left foot to side, still turning. Second: close R.F. to L.F., step diagonally back with L.F. Third and Fourth: R.F. back, turning on it to L.; *close L.F. back to R.F., turning to L. on R. heel pivot.*

Correct Hold in Dancing

The fact that one of the partners is very tall or short should make no difference to the form of the hold. A tall man should guard against clamping a short girl or straining at a tall one. He need only alter the position of his arm from the elbow to the wrist, just raising or lowering it a little, as the individual may need. The position of the upper part of the arm should remain the same. The actual formation made by the hands, whether the girl's or man's, is immaterial, or rather it relies, like many other things, on the individual sense of good taste, being neither clumsy nor affected. The man's hand should rest on the girl's back in a light natural position, and the girl's hand should be the same, not spreading the fingers nor yet "curling" them.

The hips of both partners are always slightly forward in dancing, as they respectively lead and follow from the hips, not by means of the man squeezing and clutching with both arms and the girl hanging on with both hands. If this hip movement is tried it will be seen at once that the girl must know what step is coming next, without any extra pressure of the hand on her back. The only time when this may be needed is when the man decides to do an outside step, then the very slightest pressure with two fingers is enough to indicate this change. The girl must not, under any circumstances, anticipate, but must remain supple and ready to follow. To enable her to do this easily, the man must lead definitely and from the hips.

Poise and Balance. Balance is obtained principally by correct distribution of weight, and this is a simple walk backwards which the beginner can practise. Done correctly it will ensure accurate balance, which is more than half the secret of graceful deportment, whether in walking or dancing. Take a long step from the hip, the ball of the back foot meeting the floor; keep the pressure of the front foot on the heel whilst travelling backwards, and never let the back heel drop until the front foot passes it. The knees must never be stiff in dancing, but never really bent. They must be straight and relaxed alternately, the travelling leg being straight and the knee of the supporting leg relaxed. Here, again, one must remember that dancing is natural movement, and this straightening and relaxing of the knee alternately is exactly what should occur whether a person is walking in the street or running on a tennis court.

This naturalness in dancing can scarcely be over-emphasized. A "natural" dancer with an inborn sense of rhythm is preferable to one who is over-anxious to practise complicated steps.

The direction for all dances is anti-clockwise. For the comfort of others on the floor it is correct to travel around on the outside of the floor, and everything in dancing has been composed with the view of making all movements progressive. It is when two people either try to invent new steps, or the man's dancing consists of a few steps forwards, a turn, and a few steps backwards, that "crushes" occur and second lines are made in the ballroom. Generally speaking the line of dance is oblique, the steps and combinations of steps forming a zig-zag pattern around the room; in the case of the tango these lines are curved.

Style and Rhythm. With regard to etiquette, apart from the position of the hands, which has already been dealt with, good manners and the comfort of others should be the guiding rule. It is not etiquette to make up fancy steps if they interfere with the progress of the others. Nor should any deviation from the occupation of correct ballroom dancing occur, for it usually means bumping into another couple, which is as bad a breach of good manners as if it happened in the street.

In modern ballroom dancing the feet are always

parallel, unless performing a twist, e.g. the Charleston. In this case the feet are in a straight line with the toes, and neither foot is turned out. The rule for placing the feet in a forward movement is heel first, except when two quick steps follow each other. This is contrary to the old form of dancing, which was always "point toe," and is just the same as a natural walk, which is always "heel first." The only difference between the natural walk and the modern ballroom dancing step is that the latter glides along more.

There are two ways of turning, right hand, or natural, and left hand, or reverse. Contrary body movement is turning the body from the hips so that the opposite hip and shoulder move forward, or back, if stepping back with the moving feet. This movement applies chiefly to slow steps, and curves are governed by that. When a foot has to move from an open—that is, feet apart—position to another open position it must pass close to the stationary foot on the way. This is known as brushing.

There are three popular times for dance music, 4/4, which embraces the slow foxtrot, quickstep, blues, mid-way rhythm: 3/4, which is waltz time; and 2/4 for the tango.

DANDELION. In a cultivated state the dandelion makes an excellent salad, and the improved varieties, such as large-leaved French, are grown in many large gardens. They are raised from seed sown in spring and thinned to a foot apart.

In late autumn the roots may be lifted, placed in boxes of soil and forced into growth in a dark, warm place. Or the fresh spring growth can be blanched by covering the plants with pots.

The dandelion as a weed on the lawn must be dug or spudded out, and a little salt or weedkiller dropped into the hole. One way of destroying is to dip an iron skewer into sulphuric acid and force it into the heart of the plant. In medicine the dandelion, or taraxacum, is sometimes used as a simple bitter and stomachic. It is also laxative. The common preparations are: extract of fresh dandelion root, dose 5 to 15 grains; liquid extract of dandelion root, dose ½ to 2 drams; juice of dandelion root, 1 to 2 drams.

DANDIE DINMONT. The affectionate and intelligent little terrier known by this name is often confused with the Aberdeen and the Skye terriers.



Dandie Dinmont. "Leydon Piper," a prizewinner of this favourite breed of small Scotch terrier.

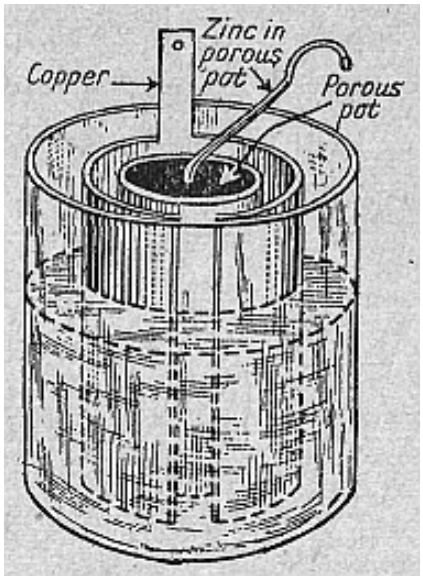
The head is large, the muzzle strong and the nose black. The broad-based, tapering ears hang closely to the cheeks. The legs are short, and the rather short, feathered tail with a slight curve is carried little higher than the line of the back. The hard, but not wiry, coat is about 2 in. long, and has a mixture of softer hair. On the head the hair is silky. The colours of the terrier range from bluish black to silver grey, and from red brown to pale fawn. If the upper parts are black or grey (pepper), the legs should be brown or fawn; if brown is the upper colour (mustard), the head should be creamy white, and the legs a shade darker than the head. The height at shoulder should be from 8 in. to 11 in., and the weight 14 lb. to 24 lb., but preferably about 18 lb. *See* Dog.

DANDRUFF or Scurf. Dandruff is due to inflammation of the scalp caused by microbes, and shows itself as an accumulation of yellow or grey scales, which consist of the horny cells of the skin, produced in excess and thrown off. In treatment the first step is to remove, as far as possible, the crusts and scales on the scalp. Shampoo the head well with tincture of green soap, which can be obtained from any chemist. It is important to remove all the soap from the hair, so the head should be rinsed with several changes of clean water. The following sulphur ointment should be rubbed thoroughly through the roots of the hair:

Precipitated sulphur	20 grains
Salicylic acid	10 grains
White vaseline to make	1 oz.

The treatment is repeated as often as may be necessary to keep the scalp clear of scales. *See* Baldness; Hair; Shampoo.

DANIELL'S CELL. This is a form of electric cell designed to obtain constant voltage. It consists of a glass jar in which is a copper plate usually bent into the form of a cylinder of such size as to stand in the jar and leave plenty of room in the middle. Inside the copper cylinder stands a porous pot, that is to say, a jar made of unglazed earthenware, and inside it is a zinc rod.



Daniell's Cell. Diagram of the component parts.

The porous pot is filled with a dilute solution of sulphuric acid, and the space between the glass jar and the porous pot is filled with a saturated solution of copper sulphate. The copper sulphate solution is kept saturated by adding a number of crystals of copper sulphate; these must be added to from time to time, as they

dissolve when the cell is in operation. A shelf is sometimes fixed to the copper cylinder to receive the supply of copper sulphate crystals.

The voltage of a Darnell's cell is just over one volt. They are particularly suitable for heavy and continuous work and are employed for closed circuit burglar alarm systems. When a Daniell's cell has been charged with electrolyte the two terminals should be connected by a piece of thick copper wire so as to short circuit the cell, leaving it thus for twelve hours or more. *See* Burglar Alarm.

DAPHNE. Of the hardy daphnes the favourite is the mezereon (Daphne mezereum), a slow-growing shrub 3 ft. or more high, which bears reddish-purple fragrant flowers in Feb.-Mar. It is suitable for the rock garden or the front of the shrubbery border. It likes soil containing lime. Daphne eneorum (alpine garland flower) with fragrant, rose-coloured blooms, and blagayana, cream-coloured flowers, flourish in the rock garden in peaty soil; the branches of the latter should be pegged down. Daphne laureola, spurge laurel, is an evergreen which will thrive in the shade. The height is from 3 to 4 ft. It is commonly raised from seed, and has glossy leaves and yellowish-green flower in winter. Daphne indica is a favourite winter greenhouse plant with fragrant flowers.



Daphne mezereum, a hardy species of the flowering shrub which will thrive in the open.

THE DARK ROOM AND ITS FITTINGS

How to Adapt or Construct a Room for Photographic Work

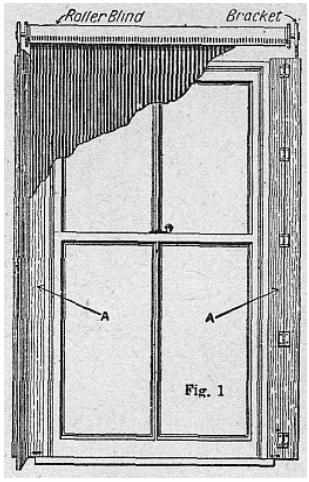
The processes carried out in the Dark Room are described under Developing; Enlarging; Printing, etc.

Although there are systems of developing photographic films or plates in full daylight, a dark room is a necessity for photographic work.

It is quite practicable to do almost any kind of photographic work in an ordinary room which is temporarily darkened. Several patterns of darkroom cabinet are sold. They provide a convenient and not unsightly storage place for dishes, bottles, etc., whilst the door of the cabinet, in some models, forms a bench or table. A bathroom is most convenient for use in this occasional way.

In fitting up an ordinary room for photographic use any window has to be blocked up. It is best to do this so that the full light from the window can be quickly obtained if required, for there are many operations that are preferably done by daylight, and also it is then much easier to keep the room in its necessary state of cleanliness. Most windows can be fitted with a wooden frame covered with two thicknesses, of stout brown paper or black blind material. A few wooden wedges will prove sufficient to keep it in place.

An effective and easily fitted dark room blind can be contrived with an Acme or similar type spring roller fixed on brackets well above the window frame (Fig. 1). Down each side of the window hinged shutters are fitted to exclude light at the sides when the blind is drawn (Fig. 2). Dimensions will vary with the size of the window, but the blind should be arranged to overlap the inner shutter (Fig. 1, A) at least 1 ½ in. The blind should be made of thoroughly opaque material, such as un-glazed American cloth fastened to the roller with glue. This does not prevent the use of ordinary curtains and blinds.



Dark Room. Fig. 1. Blind for making a temporary dark room.

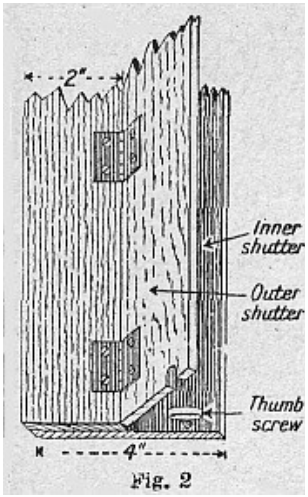


Fig. 2. Details of light-excluding shutters for use with the blind.

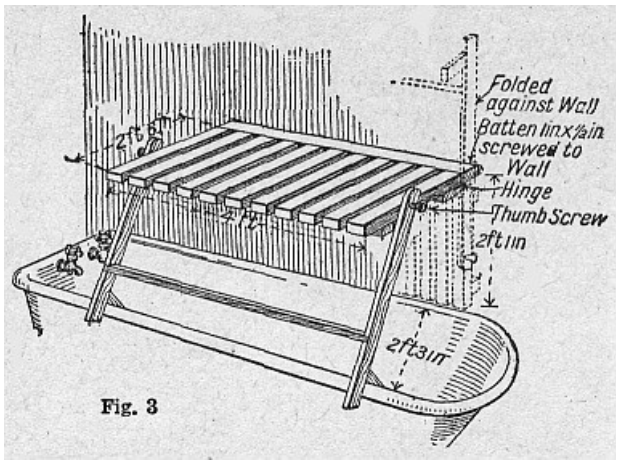


Fig. 3. Folding table placed over a bath.

Ventilation must not be neglected. If the room has a fireplace, this will be sufficient; but if there is none, an inlet and outlet of air must be contrived somewhere, if only in the top and bottom of the door. Right-angle tube-pieces, like stove pipes but rather smaller, can be bought for dark room ventilation and can be fitted to the covered frame which is used to close a window.

Much labour is saved if a water-tap sink and waste

pipe can be provided: but these are not absolute necessities. If water cannot be laid on, an excellent substitute is a tank holding a few gallons fixed on a stout shelf a foot or two above a sink. Such a tank of zinc fitted with a tap, is a stock article. The sink should be shallow (about 3 or 4 in.) and of fair size, about 3 ft. by 2 ft. It is either of earthenware or of lead in a wooden casing. If a pipe for carrying off the waste water cannot be arranged, a large bucket serves the purpose, a rubber hose being fitted to the sink outlet. If constant flow and escape of water are not available, washing of negatives or prints can be easily and readily done in the domestic bathroom.

It is convenient to support the sink on a pair of cupboards; those sold as ordinary meat safes answer well and serve for the keeping of dishes, tanks, etc. The sink itself should be covered with a rack of stout wooden slats, which forms the work bench and allows all drippings of solutions to pass through and drain away. Some narrow shelving, not more than 3 in. wide, for the bottles of solutions completes the fitting of the work bench. It should be placed so that it stands on a firm support, any nails serving to hold it upright on the wall just above the work bench.

Lighting is most important and it is economy in the long run to pay for the best. The small oil or candle ruby lamps sold for a shilling or two are useless. The essential is to have plenty of light, and that of a kind which is safe for the particular kind of sensitive material. The lamp should be fairly large; the size of the safe-light, which is the coloured screen of the lamp, should be about 10 by 8 in.

The most convenient form of dark room lamp is electric with a two-way switch, by which a bulb outside the lamp can be instantly brought into operation whenever white light is required. For bench use the lamp should be of the pattern in which the front is vertical or slopes slightly forward. A hanging lamp in which the safelight is horizontal gives a flood of light straight down on to the work-bench. This form is by far the best for the development of prints, the progress of which is judged by looking on them, not through them, as with negatives.

If gas has to be used, it is necessary to buy a large lamp on account of the heat which is developed, and if the dark room is very small it is advisable to place the gas burner itself outside, fixing the safelight as a window. The same considerations apply to an oil lamp.

When the bathroom is used as a dark room it will be found very tiring to lean over the bath or kneel down in front of it for lengthy periods. This can be avoided by arranging a hinged table over the bath at the height of a person sitting (Fig. 3). The methods of construction are shown clearly in the diagrams. Sizes will vary according to the width of the bath and the height of the table.

Make the table of slats of wood about ½ in. apart, so that spilt liquid may fall straight into the bath. If a trickle of water from the bath tap is allowed to run there will be no risk of staining the bath enamel with developer. Hypo has no effect on enamel. If possible, dishes should be kept in the bathroom, and a plate rack or slatted shelving put up to provide easy drainage and to keep them free from dust. Dust is the photographer's principal enemy.

A Portable Dark Room. A small dark room, as is shown in Fig. 4, made in sections so that it can be moved from place to place, is extremely useful to the amateur photographer. The door is arranged to fit into one section, and virtually forms one wall of the building. The other sections are covered on the outside with weatherboard, and lined on the inside with 3-ply wood.

The floor rests upon 3 in. by 2 in. floor joists, to which it is securely nailed with 2 in. oval brads. The roof is formed of ¾ in. matchboards, nailed to 2 in. by 2 in. rafters, and bolted to the frame of the building. It should be covered on the outside with good waterproofed material. The window is formed opposite the door, and should be glazed with clear glass. Separate frames are made to fit over the window frame; these are covered with fabric or glass of any desired colour, and may be rebated and fitted with a panel of safelight coloured glass. These frames are held in place by turn-buttons, securely screwed to the window framing and arranged to bear on wedge-shaped slips of hardwood fixed to the removable frames, as shown in Fig. 5. The edges of the frame may be covered with felt, so that when the turn-buttons are twisted they bear on the wedge-shaped slips and thus close the frame up tightly. Details of construction are shown in Figs. 6-10. The joints are simple, being merely halved together. The door (Figs. 7 and 9) is made double by first constructing an ordinary ledged and braced door, and covering the inside with ordinary 3-ply board, having previously glued and nailed make-up pieces to the inside of the door in the manner indicated in the drawings. A good stopping of 1 in. square stuff is requisite, and it should be faced with felt to exclude all light.

To allow for ventilation, an air inlet is provided (Fig. 10), and slotted and so fixed that air can enter but light cannot pass.

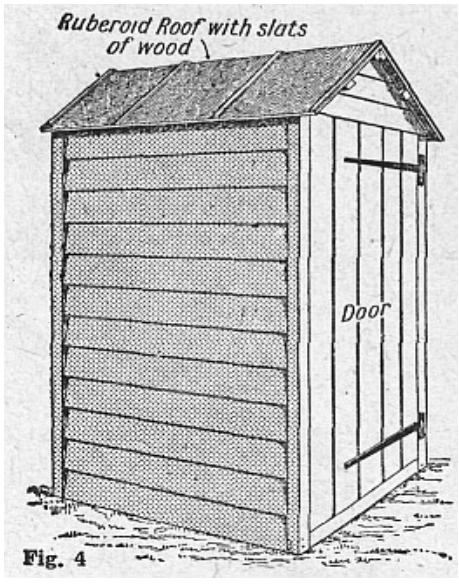


Fig. 4

Dark Room. Fig. 4. Easily made portable dark room.

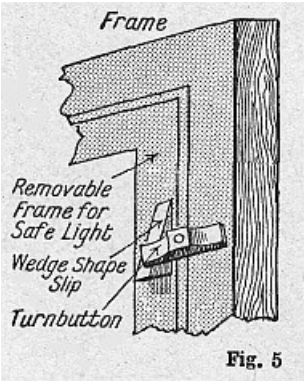


Fig. 5

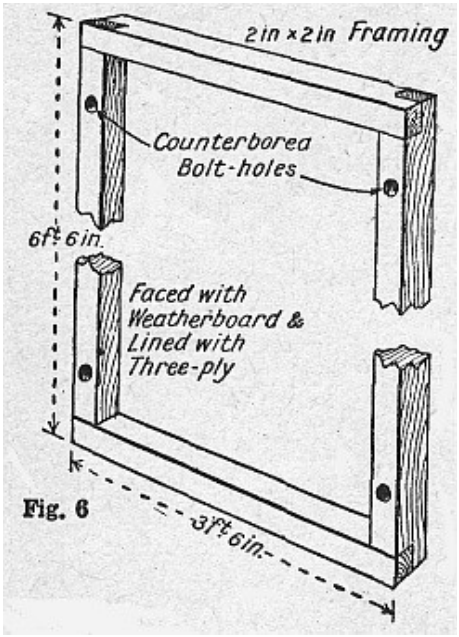


Fig. 6

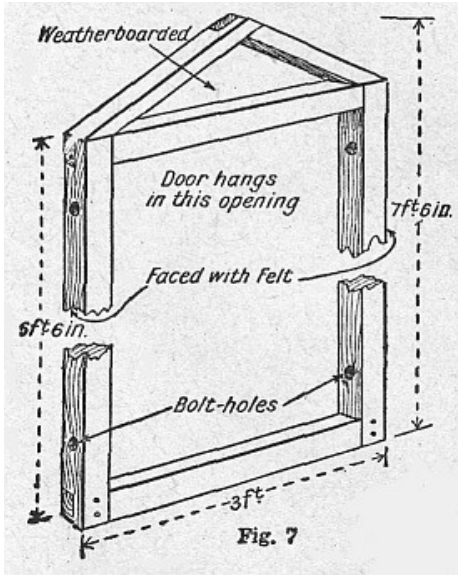


Fig. 7

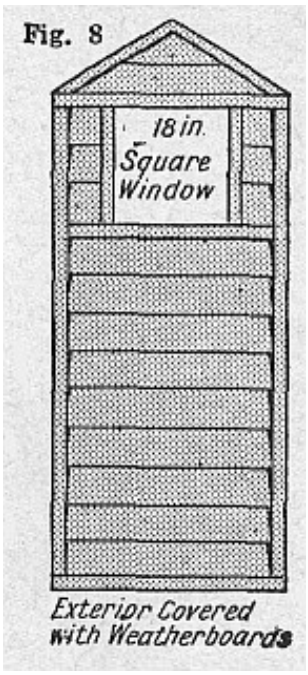


Fig. 8

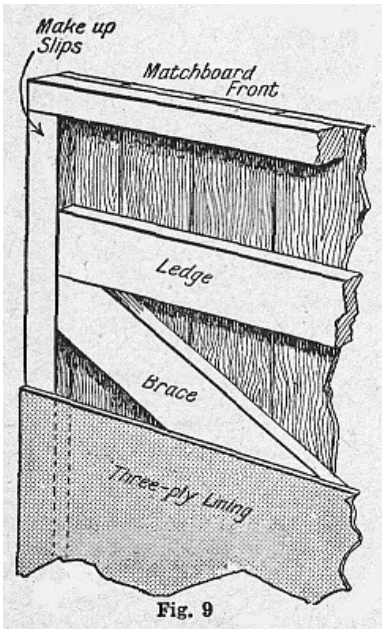


Fig. 9

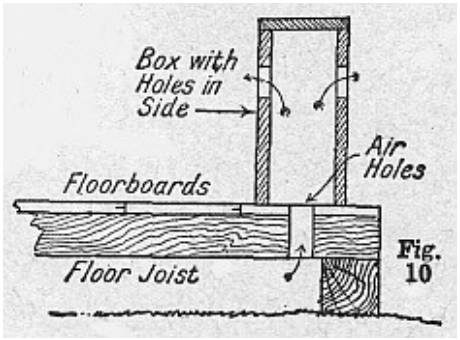


Fig. 10

Fig. 5. Detail of window frame.
Fig. 6. Detail of side frame.
Fig. 7. Framework for doorway.
Fig. 8. Back frame.
Fig. 9. Door.
Fig. 10. Air inlet.

DARK SLIDE. The old-fashioned wooden double dark slide opening like a book is now largely displaced by the single metal sheath holding one plate. These metal slides should not be allowed to become rusty, and should always be carefully dusted out before inserting fresh plates. Attention should be paid to the strip of velvet on the top of the plate-holder which traps the light when the slide is withdrawn during exposure in the camera. If the velvet is worn or flattened, light will leak past and fog the plate; if the velvet is brushed up after unloading a slide, it will not only be kept free from dust, but will be less liable to allow light to enter.

To blacken slides when worn, wash in strong soda water, which removes rust and grease, followed by immersion in a weak sulphuric acid solution in the proportion of 1 dram of strong sulphuric acid to 1 pint of water. They are then blackened by boiling in the following solution:

Hyposulphite of soda	180 grains
Copper sulphate	120 grains
Water	10 oz.

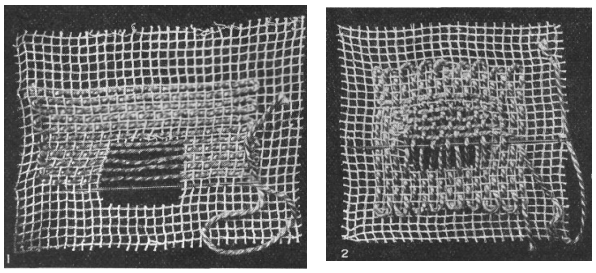
See Camera; Photography.

DARNING. Too heavy a mending yarn pulls and strains the material to be darned, and soon leads to further holes; too fine a one only fills the rents with twice as much labour as is necessary, and does not last long. The idea is to counterfeit the weaving of the material, first one way and then the other, till the hole is filled with closely interlaced threads going over and under each other at right angles.

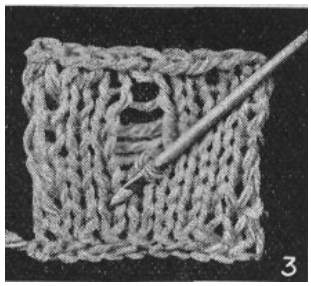
Start on sound material well outside the edges of the hole, running the needle (threaded double for all but small repairs) in and out of the stuff in a straight line. Return as close as possible to the first line, going under the stuff where that went over, and vice versa. At the end of each line do not pull the thread tight, but leave a tiny loop, Fig. 1; this allows for the shrinking of the new thread in the wash. Continue darning up and down till well outside the hole on the far side and on sound stuff again. Then darn closely across at right angles, alternately under and over the original lines of stitches, Fig. 2, until the hole is completely filled. Thin, places should never be allowed to run into holes. If they are darned one way only they will last for a long time.

When mending a ladder stop the dropped stitch from running with a temporary stitch. An ordinary crochet hook will assist the repair, as shown in Fig. 3. Note that the hook draws each line of thread through the stitch separately and restores the actual pattern. Darning balls or eggs, over which the hole can be stretched smoothly while in course of repair, make the work easier and less cramping to the hand. Anything of a delicate nature should be repaired before being laundered.

On woollen garments of a uniform colour a piece of canvas large enough to overlap the edges of the hole should be cut out and tacked in place on the wrong side of the material, so that the lines of the canvas run exactly parallel with those of the weaving. This may be coarse or fine, according to the texture of the material. The raw edges of the tear are cut away to form a square, and the wool is darned across, backwards and forwards, stitches being caught into the material, on either side, as in Figs. 1 and 2.



Darning. Figs. 1 and 2. Method of darning a hole, illustrated on open-mesh canvas to show stitches.



Darning. Fig. 3. Mending a ladder with an ordinary crochet hook.

Darning Stitch. The straight darning stitch for simple embroidery is shown in Fig. 4. The rule for straight darning is to take up half as much material as that passed over, the latter forming the length of stitch. In fancy darning the stitches are spaced to suit the design. *See* Mending; Stocking; Wool.

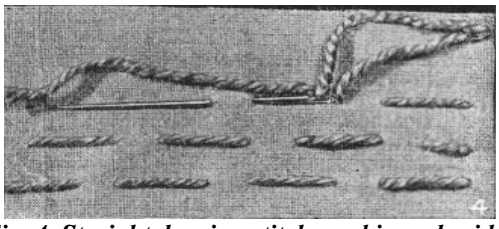


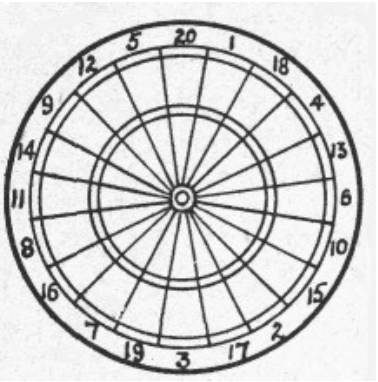
Fig. 4. Straight darning stitch used in embroidery.

DART: In Dressmaking. A dart is a wedge-shaped piece of material taken up on the inner side of a garment, to remove any unnecessary fullness. It must be carefully made by taking up just the amount of material that is not required and gradually sloping it off to the point where the dart is to finish.

DARTS. This game, played indoors with a wall target and small darts, is one of the finest games of skill, demanding a keen eye, a steady hand, mental judgement and a head for figures. Its extraordinary popularity has now extended from the public to the private house, for all the year round.

The dart-board is circular, 18 inches in diameter, made usually of elm 2 inches thick, marked on both sides; when a side gets badly pocked it is restored by soaking in water.

The faces of the board are divided by wires nailed to the surface into 20 segments, numbered from 1 to 20, but in irregular sequence, unlike a clock face. Thus, for instance, No. 2 is at "5 o'clock," No. 19 at "7 o'clock."



Darts. The type of dart-board most generally used.

The bull's-eye, a ½-inch circle in the centre called the "dosser," counts 50, and round it is an "outer" worth 25. Round the edge of the board is a metal strip ⅜-inch thick, counting double the number concerned; halfway to the "dosser" is a similar circle, counting treble.

Each player in turn throws 3 darts. The usual form of the game starts and finishes on the double strip. The score required is always an odd number: 1,001 in team games, 101 or 201 in duels and 301 or 501 for foursomes. "301 up" is usual.

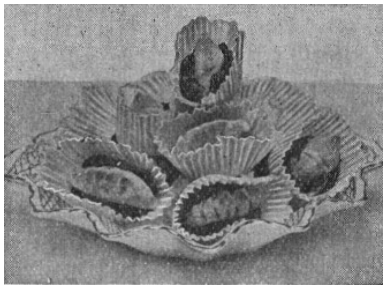
Scoring. Before a player can score, a dart must be lodged in the narrow "double-strip." After this, darts score the number of the segment in which it is lodged. Each score is subtracted from the agreed total; and victory goes to the player who first reduces his total to exactly nothing with a "double." For example, if he has 20 left he must get a double 10; if 9 left, a small odd number—say 1—and then a double 4. Exceptionally skilled players get 101 with the first three darts: e.g. 38 (double 19), 13 and 50 (double 25).

Of other variations of the game, Shanghai, Oxo, Cricket, Shoveha'penny, etc., the best is "Round the Clock." The player must get one dart in each segment in numerical sequence (1, 2, 3, 4, etc.), and finally one in double 20 (or 50, by arrangement). The starter carries on until he fails to improve his position in any one series of 3 darts. Then his opponent throws. First to get final "double" wins.

In the home, Darts is an admirable game for an informal party. There are infinite variations and local conventions of the game in different parts of England. There are at least 5 different types of board: compressed paper and cork boards are little used now, but "pig-bristle" is a good material into which darts sink deeply but not too easily. Lighting should be brilliant but shielded -from the eyes. Some players prefer to carry their own darts; beginners should use light wooden ones, graduating after experience to heavy brass darts. Weighted or unweighted feather darts have individual advantages. They cost about 10½d. a set, and should be withdrawn gently from the board to preserve their condition. The player generally stands 9 feet from the board, whose centre is usually 5 ft. 8 in. from the ground. Tossing a coin or "who throws nearest the dosser" decides who shall start. The game abounds in technical terms (e.g. Bed-and-Breakfast= 26): these and the full rules may be obtained from the London Darts Club, or from Mr. Rupert Croft-Cooke's exhaustive monograph on the game. Everyone develops his own style. Most players, however, throw from eye-level with legs apart.

DATE: The Fruit. The dessert varieties of this fruit are generally bought in boxes weighing between ½ lb. and 1 lb. These dates should be a shiny, golden brown in colour, large and soft. Cooking dates are usually bought by the pound. Before using them, the dates should be separated and washed in tepid water. They will improve if soaked in cold water overnight.

To stew dates, split open 1 lb. of them, and remove the stones. Put them in a saucepan, cover with cold water, and simmer them until they are soft. They need no sugar.



Date. Dish of appetising sweets made from this fruit.

Attractive sweets can easily be made if some good dessert dates are split open, the stones removed, and a roll of almond paste, coloured with cochineal, etc., inserted instead. The stuffed dates should be warmed in an oven for 15 min. in order to set the paste, then allowed to cool, and put into paper cases.

A blancmange can be flavoured with chopped dates, and this fruit also makes a good compôte. Stone 1½ lb. dates, and put them into a clean jar containing the strained juice of a large lemon, 6 oz. sugar, and 1½ gills Malaga. Have ready a pan of boiling water, place the covered jar in this, and then cook its contents as slowly as possible over a very low fire, or at the side of the gas-stove. Leave it thus for an hour or more, and let it get cold before serving.

DATE PLUM. These are small yellow plums, extremely astringent before ripe, but sweet and of good flavour when ripe. In America the date plum is known as persimmon. It is used in the same way as other plums, and can be eaten raw or cooked. For jam-making, 1 lb. of sugar should be allowed to each lb. of fruit. *See* Jam; Plum.

DATE PUDDING. Peel and chop up finely a good-sized apple, and mix it with ¾ lb. of washed, stoned, and roughly-chopped dates. Make a suet crust, using about 5 oz. flour, and roll it out fairly thin. Line a greased pudding basin with the pastry, then fill it up with alternate layers of date and crust, pastry being on the top. This pudding, which will need steaming for 2 hours or more, should be turned out and served hot with boiled custard.

Another date pudding is made by chopping ½ lb. dates very small, and mixing them well with 3 oz. sugar, 6 oz. breadcrumbs, 4 oz. flour, a little baking-powder and a good pinch of salt. Now beat up together 4 oz. of dripping or lard, 1 gill milk, 1 tablespoonful treacle, and 1 egg. Mix the wet with the dry ingredients, and put the whole into a greased pudding

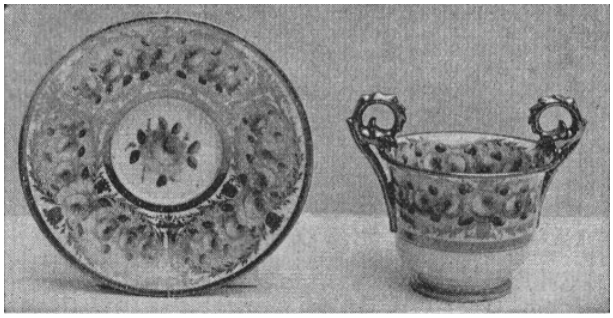
basin so that it fills only ¾ of it. Twist some greased paper over it and steam for a good 3 hours.

DATURA: The Thorn Apple. The datura is a half hardy annual and shrub belonging to the potato family. Of the shrubs the favourites are Datura (brugmansia) suaveolens, with white, and sanguinea with red flowers in late summer, they may be grown in tubs or large pots and placed out of doors for the summer, but must be brought under glass in autumn. The annual daturas are raised from seeds sown in slight heat in February-March and planted out of doors in May. A few of the best are cornucopia, double flowers, purplish white; Metel, white scented blooms; and ceratocaula, white fragrant flowers. These bloom in summer and grow 2 to 3 feet high. The common thorn apple (stramonium) has white flowers which are followed by spiny fruits.

DAVENPORT TABLE. This type of writing table, or escritoire, is chiefly associated with Victorian furniture, and consists of a desk placed upon a pedestal, below which are a set of drawers. These do not open at the front, but at the side. The desk is the same width as the pedestal, but is made to slide forward, so that a person can sit and write at it in comfort. It has a hinged lid, below which is a receptacle for papers, etc., and in which small drawers are sometimes fitted.

In some of the pieces there is also a sliding shelf that draws out at the side and is used to hold paper, etc. These desks are usually covered with leather and have a low rail round the top to prevent the pens from failing. *See* Bureau; Writing Table.

DAVENPORT WARE. This Staffordshire ware, including porcelain, stone china and earthenware, was produced by a family of that name at Longport for about a century after 1793, and usually bears the potter's surname, either with an anchor or sometimes with the place-name.



Davenport Ware. Porcelain plate and sugar bowl, with delicate floral design, c. 1815. The mark, an anchor and the word Davenport, is printed in red.
(By permission of the Director, British Museum)

The porcelain is a fine bone-paste, sometimes white, cream-coloured and blue-printed. Collectors usually look out for the tea and dessert services with deep blue, rose du Barry or apple-green grounds, and attractive panels of scenic and floral subjects. There are also choicely painted vases, and all have massive gilding on the rims, handles and feet. Except for the mark, such ware is not easily distinguished from Derby or Coalport china of the same period.

The willow pattern with only 25 apples on the tree is readily recognized, as the corresponding Wedgwood, Spode and Adams patterns have no fewer than 32 apples. Davenport ware has a tendency to become covered with minute surface cracks, and some of the cups appear as if tea-stained, a defect which cannot be removed. *See* China; Staffordshire Ware.

DAY LILY (Hemerocallis). This lily is a beautiful hardy flowering plant, 2 to 3 feet high; in June and July it bears lily-like flowers in shades of yellow and orange. It thrives in ordinary soil in a sunny or slightly shady border, and is increased by division in early autumn. Some of the best sorts are aurantiaca, apricot, flava, fulva and Queen of May. Although the individual blooms last only for a day, the plant continues to flower throughout several weeks. *See* Lily.

DAYLIGHT SAVING. This term is used for the system, known also as Summer Time, of putting forward the clock by one hour at the beginning of summer and putting it back an hour at its end. The nominal time remains the same, thus avoiding all changes in time-tables and the like.

Daylight saving was introduced into Great Britain in 1916, but it was not made permanent until later. For some years the opening and closing dates of Summer Time varied, but in 1922 uniformity was introduced. As the law now stands Summer Time begins at 2 o'clock in the morning of the day after the third Saturday in April, unless that day is Easter Day. If it is, Summer Time begins on the day after the second Saturday in April. It ends at 2 o'clock on the morning of the day after the first Saturday in October. This means that the clock is put forward one hour on the appointed day in April and put back one hour on the appointed day in October.

The law applies to Great Britain, Northern Ireland, the Channel Islands and the Isle of Man, but not to the Irish Free State. France and Belgium have adopted the same period of summer time.

DEADLY NIGHTSHADE. The common name for the belladonna plant is the deadly nightshade. Medicinal preparations are obtained from the leaves and the root, but the active principle, atropine, is found also in the berries, and poisoning has resulted from eating these; they are about the size of a small cherry, violet-black in colour, and have a sweetish taste. If the patient is able to swallow while waiting for the doctor, vomiting should be induced at once by tickling the back of the throat or by an emetic. He should be given draughts of strong hot tea, and kept warm in bed with hot water bottles. *See* Atropine; Belladonna.

DEAD NETTLE. (Lamium maculatum). This wild plant has purplish flowers. The yellow-leaved variety aureum and puralbum, which has pinkish flowers, are sometimes grown in gardens.

DEAFNESS. Injury or disease of any of the three portions into which the hearing apparatus is divided may cause deafness, or it may result from a foreign body blocking up the outer passage of the ear, and in this way preventing sound waves from touching the drum.

Children frequently cause the latter variety of deafness by poking buttons or hard peas, etc., into their ears. No attempt should be made to remove the foreign body by means of a hatpin. The child should be taken to a doctor, and if the foreign body is a pea or bean, no one must attempt to syringe it out. In the case of a live insect, however, a little warm oil may be put in the ear.

Frequently the obstruction of the passage is due to an accumulation of ear wax. A little warm almond or olive oil in the ear overnight and gentle syringing with a ten per cent solution of boracic acid and warm water the next morning may be the only treatment needed. Care should be taken not to push the point of the syringe into the ear passage. The stream should be pointed not directly against the drum but against the back wall of the passage, while the ear is drawn upwards and backwards.

If the wax does not come away easily, never attempt to remove it with a hatpin, or otherwise, nor by forcible syringing. See the doctor about it.

The deafness from a cold and the frequent attacks of deafness in children who suffer from adenoids is accounted for by catarrhai swelling of the Eustachian tube which connects throat and ear. But in this latter case and also in any condition of catarrh of the nose and throat, either acute or chronic, inflammation may extend up the Eustachian tube actually into the ear itself.

Suppuration may take place and may lead to the perforation of the drum and disease and destruction of the bones connecting this with the inner ear. Here again there is deafness; but much more serious than the deafness is the suppurative process going on in such close proximity to the brain. Sometimes there is acute inflammation without suppuration, and frequently the effects of this do not clear up properly, and some degree of deafness results. The risk of this happening will be lessened by seeing the doctor at once.

In other cases is found an increasing deafness due to chronic catarrh of the middle ear, in children and young persons, accompanied by an exudation, but in older people taking the form of "dry catarrh." These cases are practically always associated with catarrh in the nose and throat, and it is clearly of the greatest importance that adenoids and other conditions which provoke this catarrh should be early and efficiently dealt with. Diphtheria, scarlet fever, and other infectious disorders are often complicated by middle-ear disease. In long-standing chronic inflammation of the middle ear, with persistent discharge, the hearing usually becomes gravely affected. In all cases of acute or chronic catarrh or inflammation the utmost pains must be taken, under the doctor's directions, to clean up the ear.

Where there is internal ear deafness, the actual nervous structures, as distinguished from the merely conducting structures of the ear, are at fault. This nerve deafness may also be due to the action of drugs, e.g. quinine, salicion, etc., and particularly in those whose ears were otherwise affected. *See* Ear.

Care of the Deaf and Dumb. Where a child is born deaf, mutism, or inability to acquire speech by ordinary methods, necessarily follows, though the vocal organs may be quite normal. This is due to the fact that all children learn to speak by imitation; the deaf child, hearing no spoken language, acquires none, and instead develops a series of natural gestures. This led in the past to silent methods of finger spelling and signing; but the methods now employed have in view to teach the deaf to understand what is said to them by means of speech reading, or, as it is commonly called, lip-reading.

A simple and effective method of testing the hearing is the following. Place the child with its back towards you, and step backwards, two steps, roughly about 6 ft., then whisper some simple command or question. If the child does not respond, it is deaf or partially deaf, and the case should be reported to the local education authority, whose duty it is to see that the child is placed in a suitable school, either for the deaf or the hard-of-hearing. The deaf child is entitled to free education, though if this entails removal to a residential school, the parents may be required to contribute.

The child should be treated as nearly as possible as a normal boy or girl. Bad habits, a shuffling gait, mouth noises, ugly grimacing and gesturing, should be checked. He should be spoken to a little more slowly than other children, and his attention should be directed towards the lips. Every member of the family should try to keep up his interest in persons, places, and things, just as though he could hear. During the last years at school there will have been some definite trade bent in the manual instruction received, and the boys readily find occupation in carpentry, cabinet making, bakery, bootmaking, etc., while the girls secure openings at laundry-work, dressmaking, millinery, fancywork, etc. Usually an Aftercare Association will assist in placing the deaf child, and will further continue to visit and report on its progress during the first years of employment. There is also usually an agency or mission which provides special services for the deaf. In London this agency is the Royal Association in Aid of the Deaf and Dumb, at 413, Oxford Street, W.1.

Deafness occurring late in life may involve loss of employment. Nothing has so beneficial an effect in such cases as a course of lessons in lip-reading, which

renders the loss of hearing much less noticeable, and so helps to give the deaf person more confidence in himself. Classes in lip-reading are provided in most large towns, and instruction may also be arranged privately through the Royal Association above mentioned or the National Institute for the Deaf, 105, Gower Street, London, W.C.1. Much may be said with regard to artificial aids, but each case must be treated by a skilled aurist.



Deafness. Deaf and dumb manual alphabet, using both hands, a method of communication now largely superseded by lip-reading (By permission of Mr. B. H. Payne)

DEAL: Uses of the Wood. The wood obtained from the pine or fir tree is called deal and is generally of three varieties—red, white, or yellow. Planks 2 in. to 3 in. thick by 7 in. to 11 in. wide are known as deals. Most of these come from the Baltic ports. Deal is the cheapest and most commonly used wood, and is soft and light, but very durable. It is employed in house building for joists, rafters, floorboards, doors, window frames, match boarding, outdoor structures of all kinds, also for the cheaper kinds of furniture.

Red deal, which has a slightly reddish tinge, is considered a little superior to white, which is often called spruce. Yellow pine is a superior class of wood, and is not generally regarded as deal. It is not stronger nor more durable, but it has fewer knots, is easier to work, and less liable to warp. Spruce generally has many knots, which makes the wood troublesome to plane. *See* Amateur Carpentry; Fir; Wood.

DEATH. The symptoms of death are usually not to be mistaken when sudden pallor overspreads the face as the heart stops beating and breathing ceases. Rigor mortis, or stiffening of the body, may come on quickly, but on the average it appears in about six hours, and lasts for about 24 hours.

In view of the fact that a state of trance closely resembles death, and to avoid any possibility of the person being buried alive, certain signs that life is extinct should always be looked for. A mirror held before the mouth and nose may become dimmed, perhaps very slightly, but sufficient to show that breathing is taking place. By using a stethoscope the doctor may be able to hear very faint beats of the heart, or by tying a ligature tightly round a finger he may find that the end of the finger becomes red, while on the removal, of the ligature a white mark is left—thus showing the presence of some circulation of blood.

The Legal Side. Every death must be notified to the local registrar of births and deaths within five days of the event, under a penalty not exceeding £10. The person to give the information to the registrar is first of all the nearest relative present at the death or in attendance during the last illness. If no such relatives, then any relative of the deceased living in the same registrar's subdistrict. If none, then the occupier of the house where the death took place; and if he does not, then every inmate of the house is bound to see to it.

One of the next things to be done is to find out whether the deceased had made a will, and, if so, who is the executor, as the latter is the only person to look after the property and effects of a deceased person. If there is no will, or a will but no executor named in it, or the executor is dead, then the proper thing to be done is to see that letters of administration are taken out as soon as possible. The administrator then becomes the proper person to take care of and distribute the property and effects.

Death puts an end to all contracts of agency, so that, for example, a widow who orders goods for herself or the household after her husband's death, does so at her own expense, and has no claim to be reimbursed out of his estate. A banker may not honour his customer's cheque after he knows of the customer's death. Every contract depending in any way involving personal qualifications for carrying it out, comes to an end by the death of a contracting party.

If two people are killed in the same accident, e.g. a railway collision, the younger is presumed to have survived the elder. This is sometimes important in questions of family inheritance. The death of a member of a family on whom other members are dependent sometimes gives rise to a claim for damages on the part of the dependents.

Laying Out the Dead. When death takes place

under natural conditions from illness or old age, and there is no necessity for the immediate inspection of the body by a doctor or the police, certain duties should be at once performed by those in attendance.

If the deceased person is already in bed such duties are simplified, but if death has taken place in other than a bedroom it is better to select and prepare a bed before the body is laid upon it. When possible a mackintosh should be placed over the mattress, or if that is not obtainable thick brown paper or a spare piece of linoleum or American cloth. This can be covered by a clean sheet. If death has taken place in bed, it is presumed that some such provision has been made. Pillows, bolsters, water-beds, hot bottles, and any surgical appliances should be removed. The body should be divested of all garments and laid quite straight, the arms to the side and the ankles tied together.

A small pillow for the head can be kept if required, but it is better at first to use none. The head can be turned gently on one side to allow any fluid in the mouth to escape, The eyelids should be closed and kept in position by pads of wet cotton-wool, or a heavy coin. False teeth and rings should be removed, if required. A bandage or cloth should be tied under the chin around the head to keep the jaw in position until rigor mortis has set in. Cover the body and leave it, if possible, for half to one hour.

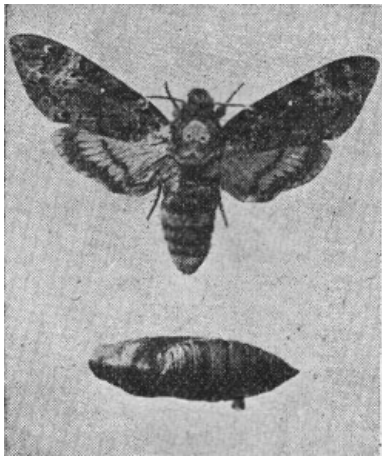
This time can be spent in clearing the room of unnecessary fittings and signs of illness, preparing a clean gown and sheets, and dressings if required, a basin of clean water, soap and towel. The body should then be washed and cleaned all over, and the hair brushed, parted and plaited as occasion requires. Avoid the use of pins of all kinds. Small plugs of wool may be used in the ears and nostrils. Any wound or sore should be covered with a wet dressing of strong disinfectant, and a thick pad of wool bandaged securely over.

The deceased should then be clothed in a shirt or gown, or if preferred wrapped in a sheet. White socks or stockings may be used on the feet and a small pillow placed under the head. Cover the body completely with a clean sheet, or, alternatively, the sheet may be turned down on the bed in the usual way, and a handkerchief used over the face. It is better to keep pads or weights over the eyes for the first 24 hours. If the body is a heavy one it is of great assistance to the undertaker if towels are laid under the shoulders, hips and feet. *See* Cremation; Executor; Funeral; Mourning; Will.

DEATH DUTIES. This is a collective name for the duties paid on the property left by a dead person. In the United Kingdom, since 1894, they have consisted of the estate duty and the legacy duty. Australia, Canada, and other parts of the British Empire raise revenue by death duties of various kinds. The payment of the death duties is the business of the executors, who are responsible for the valuation of the estate and must satisfy the inland revenue authorities about the accuracy of their figures. *See* Estate Duty; Executor; Intestacy; Legacy Duty; Will.

DEATH RATTLE. When vitality is very low fluid collects in the windpipe and bronchial tubes, and the air entering or leaving the chest in breathing, passing through this fluid, produces a gurgling sound, popularly named the death rattle.

DEATH'S HEAD MOTH. The largest of British moths may be known by its grey-brown fore-wings mottled with yellow, the yellow hind wings crossed by a broad and a narrow dark band, and by the black-belted yellow hind-body with its central stripe of blue. Most striking is the yellowish patch on the fore-body, which has a curious resemblance, stronger in some specimens than in others, to a human skull. The usually yellow-green caterpillar when fully grown is nearly 5 in. long and thicker than one's finger. It feeds chiefly upon potato-haulm, also on the tea tree and snowberry.



Death's Head Moth and pupa.

It does not appear in such numbers or so commonly as to constitute a menace to the potato crop, but the moth has a bad reputation as a honey stealer. In all stages the insect is so large that hand-picking is the surest means of controlling it. *See* Moth.

DEBT: In Law. In law a debt is a sum of money which one has contracted to pay as distinct from damages, which is a sum one is ordered to pay for some wrongful act or breach of contract. A debt is due the moment it is contracted, but if it is to be paid on a future date, or on the happening of some event, it is not payable until the date arrives or the event happened.

A debt cannot be sued for until it is both due and payable. Unless there is a contract to that effect, a creditor is not bound to go to his debtor, or to ask him for the money; it is the debtor's business to go to the creditor and pay him. If there is any dispute as to how much is owing, the debtor should tender in cash (not a cheque) the amount he says he owes. A husband is very often sued for debts contracted by his wife. If a wife contracts debts of her own, her husband is not liable for them; but if she purports to act as his agent, he will be liable in certain circumstances. Thus, if she manages his household, she has implied authority to order on his behalf such household requisites, including food and clothing for herself and the children, as are reasonably necessary, having regard to the husband's position in life.

If a husband turns his wife away, or by his cruelty or misconduct compels her to leave him, he is still, unless he makes her a reasonable allowance, liable to pay for board, lodging, and clothing to a reasonable extent, that is, for necessaries. If they are separated owing to her misconduct he is not liable for anything.

When husband and wife are living together, and he makes her an allowance for housekeeping or for dress, she cannot pledge his credit. When a wife has once contracted debts with a tradesman, and the husband pays, and he afterwards puts her on a cash allowance, he must warn the tradesman to give no more credit. It is also better to warn the local trade protection society, so that they can circularize their members.

An infant, that is to say in law a person under 21, is, as a rule, not liable under his contracts; but an infant is liable for debts contracted for necessaries. These include food, drink, clothing, lodging, and instruction according to the infant's rank in life. Even when an infant owes a debt for clothes (say) which are suitable to his station, the debt may not be enforceable, because the infant may plead that he was already supplied. For instance, if an undergraduate at Oxford ordered an evening suit he would, prima facie, be liable to pay for it; but if he could show that he already had two evening suits in good condition, he is not liable to pay for the third. Debts can be attached, i.e. if A owes money to B and B owes money to C, C, being unable to get his debt paid by B, can apply to the court for an order compelling A to pay the debt to him instead of to B, or such part as will satisfy his claim. This is known as a garnishee order. Debts can be assigned by one person to another; but in such cases the assignment must be absolute and in writing.

DECANTER. The decanter developed from the wine flasks made in Italy in the 16th century. In the 17th they were made in England, and those of the early 18th century long remained the standard type. In the middle of the century some decanters were made with the vine pattern of grapes and leaves, while others of about the same time belong to sets of Jacobite glass.

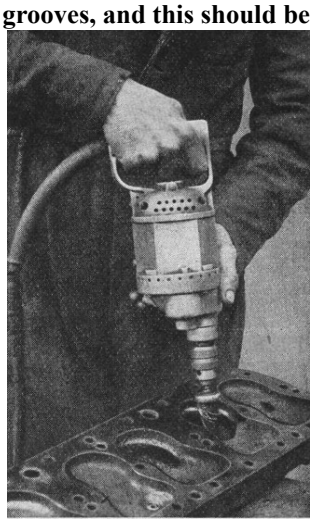


Decanter. Antique decanters in cut glass, showing three of the many beautiful and graceful shapes that are obtainable.

A little later came the decanter with rings round the neck, this variety, like many of its predecessors, being of finely cut glass. Small decanters were also made to go with a set of liqueur glasses. For them ruby coloured glass was popular in the early part of the 19th century.

A decanter stand or coaster is an article sought by collectors whether made of silver or old Sheffield plate. They were fashioned to hold a decanter and so prevent the wine from staining the table, and first appeared in England about 1770. Most of them have wooden bottoms and the sides are ornamented in various ways. *See* Glass; Sheffield Plate; Silver.

DECARBONIZING. This is the term employed for the removal of the carbon deposit which forms on the inside of internal combustion engines. After a motor car or a motor cycle has been driven for a distance varying between 3,000 and 8,000 miles or so, the engine will show a steady falling off in power, a tendency to overheat and to knock on hills, chiefly due to the deposit that has been formed in the cylinder and on the piston. Such deposit is removable in several ways: by hand, by means of oxygen, or by a mechanical process. The deposit on the piston head can be scraped off with a blunt knife or a screwdriver. It will often be found that a deposit is formed on the piston ring grooves, and this should be carefully removed.



Decarbonizing. Black and Decker process, in which carbon deposit is removed from the cylinder head by means of a rotating wire brush.
(Courtesy of A. Ferraris, Ltd.)

To remove the deposit on the cylinder head by hand is often a laborious job. The usual tool for the purpose is an ordinary long screwdriver, with which the deposit is carefully chipped off. The greatest care must be taken during the whole operation not to scratch the walls of the cylinder. Much of the deposit formed is due to road matter getting through the carburetter, and the fitting on of a new gauze will often lessen the trouble considerably. The use of the correct oil and avoidance of over-oiling will also go a long way to obviate carbon deposit in the engine.

If a motor car engine has a removable head it is easy to take this off, and then chip and scrape out the deposit in it, and also on the top of the piston. If the engine has not a removable head, a simple, but not very thorough, method is to remove the valve caps; then with a straight scraper the tops of the pistons can be reached, and with a bent one the ends of the cylinders. Scrapers for the purpose can be purchased.

If it is decided to remove the cylinders, they should be raised bodily off the pistons, and then the block can be laid on a bench and the deposit removed. While the pistons are exposed, the opportunity should be taken

to make certain that their rings are free in the grooves, and that the gudgeon pins are tight. When cleaning the tops of the pistons, pieces of rag should be stuffed in the openings of the crankcase, so that the charred matter does not fall into the latter and mix with the oil.

The oxygen process for removing carbon deposit is quicker and sometimes more effective and it obviates the need for dismantling the cylinder. The process depends upon burning the carbon away by the use of an oxygen jet.

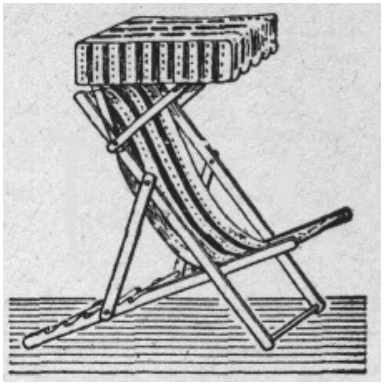
The Black & Decker method of decarbonizing, available at a number of garages, consists in the use of wire brushes which are rotated by a powerful high speed electric drill. This method is very much quicker than the ordinary hand scraping process, and the job of decarbonizing can be completed in a day. An allied process is used for cleaning the valves and guides, and reconditioning the valve seats. *See* Internal Combustion Engine; Motor Car; Motor Cycle.

DECEASED WIFE'S SISTER. Marriage with the sister of a deceased wife is now lawful in England, as it has been for many years in most British dominions, but a clergyman of the Church of England cannot be compelled to celebrate such a marriage. It is also lawful for a woman to marry her deceased husband's brother. It should be observed that it is still unlawful for a man to marry the sister of a woman from whom he has been divorced, so long as the divorced wife is living. The Act of Parliament legalising marriage with a deceased wife's sister came into force in 1907.

DECIMAL SYSTEM. The decimal system of coinage and of weights and measures, also known as the metric system, and so called because it is based upon an arbitrary unit, the metre, is one by which everything is reckoned in tens and multiples of ten. It has not been adopted in Great Britain, but the traveller meets with it when he goes to France and some other foreign countries. The franc consists of 100 centimes, and goods are weighed by the gramme and measured by the metre, as for length and breadth, and by the litre as for volume, all these being used also in multiples of ten and in divisions of ten, for example, decalitre, decimetre.

DECK CHAIR. This name is used for a light chair which folds up. The frame is made of crossed pieces of wood, across which canvas is nailed to form the seat. Some are made with a canopy for protection from the sun and some without, but in both cases the framework is the same.

A chair of this kind is easy to make. A rough idea of the finished chair is seen at Fig. 1. From Fig. 3 the general method of construction will be clear, and the plan at Fig. 2 shows exactly how the article (without canopy) will appear when folded. These chairs are made in ash, beech, birch, and sometimes oak. Any tough wood will serve the purpose, but obviously the timber must be sound. The parts required are few, and are given in the cutting list appended.



Deck Chair. Fig. 1. Folding chair and canopy which can be easily made by the amateur.

The two seat rails (A) are shown 17½ in. apart over all, and are joined at the ground end by a turned rail (D). At the seat end they are joined by the flat rail (E). The seat rails (A) are notched with, say, five notches, which adjust the lean of the back. These notches must be deep enough to take the square part of cross bar (J) without any chance of slipping. The leg rails (B) are 19 in. apart over all. At the ground end they are joined by the turned rail (F), and at the top end by the flat rail (G). The leg rails are pivoted to the seat rails at H (Figs. 2. and 3) by means of bolts. The position must be determined after the framework is made, but the bolts come approximately 12 in. from the front end of A, and 13½ in. from the lower end of B.

Thus far it will be seen that the chair is made of two frames: the inner one consisting of A, D, and E, and the outer one of B, F, and G. This may be followed from the plan, Fig. 2. The frames should fit closely, but sufficiently free to permit of metal washers being placed between them at the bolts.

From a glance at Fig. 2 it will be seen that the chair has a kind of third frame, consisting of the two support rails (C) and their cross bar (J). The support rails are bolted to the legs (B) about 16½ in. from the top end, and are joined by a cross bar (J) which engages the notches cut in the seat rails (A). The cross bar is usually turned, but with square blocks left to rest on the notches. If this plan is adopted it should be 1 ¼ in. square; otherwise it may be ⅞ in., turned throughout.

A sketch of the usual method of bolting is given at Fig. 5. To prevent friction, the inner disk of the bolt is sunk into the wood, and the end of the bolt riveted to the disk. A thin washer is placed between the rails. The canvas selected for the seat ought to be stout and durable. It is folded over the rails (E and G) and firmly tacked (as Fig. 6). When the seat is folded (as Fig. 2) the canvas should lie practically flat, but not strained tight.

A canopy is somewhat cumbersome and is apt to attract earwigs and other insects, but in bright weather it is of great advantage when reading out of doors. If a canopy is wanted, the parts required are these (Fig. 4): The arms (K and L) are bolted to the leg rails (B) about 9 in. from the end, the method of bolting being indicated at Fig. 7. Each pair of arms is joined by a turned rod (M and N), and the canvas covering—say 6 in. deep— may be tacked on or left loose.

DECK CHAIR

	Long ft.	Long in.	Wide in.	Thick in.
2 seat rails (A)	3	4	1½	¾ or ⅞
2 leg rails (B)	3	10	1½	¾ or ⅞
2 support rails (C)	1	9½	1½	¾
Cross turned rail (D)	1	5½	⅞ diag.	
Cross seat rail (E)	1	5½	1½	¾
Cross turned rail (F)	1	7	⅞ diag.	
Top rail (G)	1	7	1½	¾
Cross bar (J)	1	9	1¼	1¼

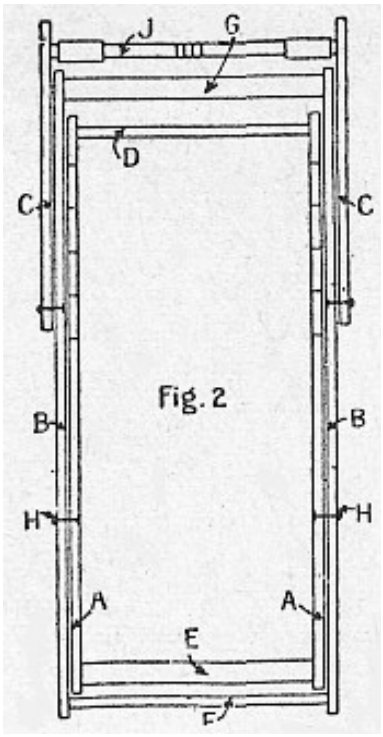


Fig. 2

THE PARTS REQUIRED FOR FIG. 4:

	Long ft.	Long in.	Wide in.	Thick in.
2 back arms (K)	1	4	1¼	⅝
2 front arms (L)	1	10	1¼	⅝
Back turned rod (M)	1	9	⅝ diam.	
Front turned rod (N)	1	10½	⅝ diam.	

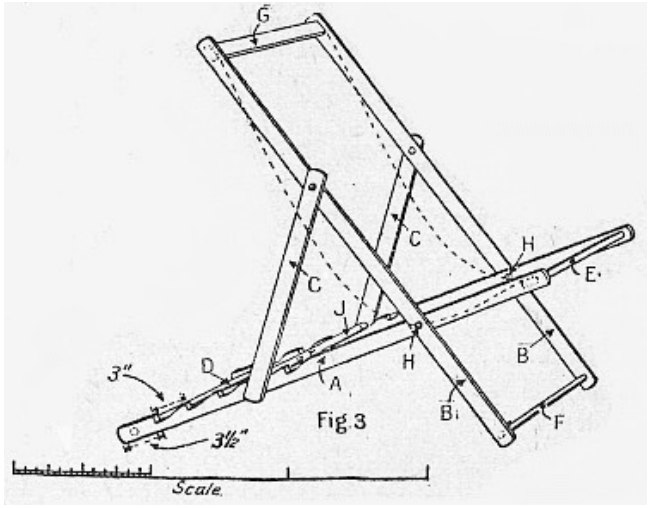


Fig. 3

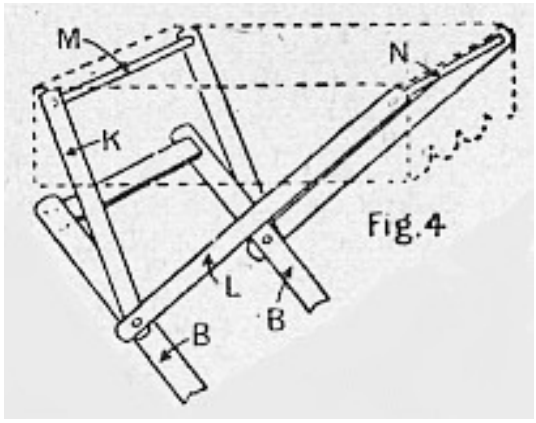


Fig. 4

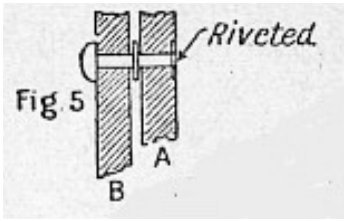


Fig. 5

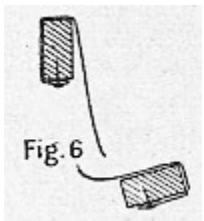


Fig. 6

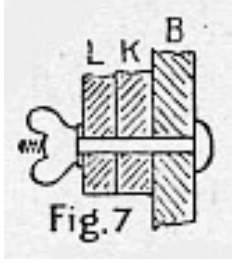


Fig. 7

Deck Chair. Figs. 2-7. Constructional diagrams showing how the various parts of the folding chair and canopy should be joined and fitted together.

DECEMBER

What to do in the Garden

Flowers

Minimum temperature for greenhouse 45°

Hyacinths for forcing in fibre may still be planted

Water all plants sparingly; dry heat is better than moist

Pot up seedlings of cyclamen, cineraria, and calceolaria, also autumn cuttings of fuchsia and pelargonium. i.e. geranium

Give as much air as possible when the shade temperature outside the house is well above freezing point

Plants which have been temporarily shifted from the greenhouse to the drawing room, for the purposes of table and other decoration, should be sprayed with tepid water when they are replaced in the house

Fruit

Prune all trees during mild spells of weather

Train and shape wall trees in the desired directions

In severe weather cover the stems of stone wall fruit, i.e. peaches, etc., with hay or straw bands

Plunge vines in pots of leaf-mould for early forcing, and put them in a temperature of 70° for fruit in spring

Spray fruit trees with one of the tar-oil washes to cleanse the branches and kill the eggs of pests

Prune vines under glass by cutting back last summer's shoots to within two buds of the base

Planting of all fruit trees may be proceeded with in the open air, so long as the ground is free from the effects of frost

Vegetables

Dig, trench, and manure ground freely, so that the frost may percolate and sweeten it

Seakale roots may be forced in boxes of soot in a dark, rather warm place

Celery plants should have the last earthing up

Cauliflower may be cut and stored on the concrete floor of a shed if severe frost is threatened

Rhubarb, asparagus, and radishes may be forced now

Start early potatoes under glass in moderate heat for planting out

Food in Season

Fish

Barbel; bream; bril; carp; cod; dory; eels; flounders; gurnet; haddock; hake; halibut; herrings; ling; mackerel; mullet; perch; pike; plaice; salmon (Dutch and Canadian); skate; smelts; soles; sprats; tench; turbot; whiting

Shellfish

Crabs; crayfish; lobsters; mussels; oysters; prawns; scallops; shrimps

Meat

Beef; house lamb; mutton; pork; veal; venison

Poultry and Game

Black game; capercailzie (till 20th); capons; chickens; ducks; fowls; geese; grouse (till 18th); hares; landrails; larks; partridges; pheasants; pigeons; pintail; plover; ptarmigan; pullets; rabbits; snipe; teal; turkey poults; turkeys; widgeon; woodcock

Vegetables

Artichokes (globe, Japanese and Jerusalem); beetroots; broccoli; Brussels sprouts; cabbages; red cabbage; cardoons; carrots; cauliflowers; celeriac; celery; chervil; chicory; endive; horse-radish; greens; leeks; mushrooms (cultivated); onions; parsnips; potatoes; salsify; savoys; Scotch kale; seakale; winter spinach; tomatoes; turnip tops; and watercress

Fruit

Almonds; apples; bananas; chestnuts; cranberries; dates; figs; filberts; grapes; hazel nuts; lemons; medlars; melons; oranges; pears; pineapples; plums (Californian); pomegranates; raisins; rhubarb (forced); walnuts

Notes for the Month

DECEMBER 25.—Christmas Day. Quarter Day
DECEMBER 26.—Boxing Day. Bank Holiday (not in Scotland)
DECEMBER 31.—End of the year. Various licences expire

DECORATION: In Cookery. The appetising appearance of food is enhanced by decoration and garnishes. The former term usually denotes ornamental colour touches to the food itself, while the latter more particularly refers to accompanying fruit, vegetables, forcemeat balls, croûtons, parsley, etc., which trim the dish.

To decorate hors d'oeuvres coloured savoury butters such as anchovy or maître d'hôtel may be put through a forcer. Coralline pepper, strips of pimento, shredded anchovies, finely chopped parsley, gherkins and truffles, the white of hard-boiled egg cut into shapes and the sieved yolk are all useful for ornamenting cold savoury dishes. Olives are decorative when stuffed with anchovy butter and placed on a ring of white of egg, a larger ring of beetroot and a round of brown bread and butter. Radishes may be cut into flower shapes, with pieces of olive to form leaves and used to decorate the centre of small individual Russian or other salads. A glacé cherry or a black grape is placed in the centre of a prepared grape fruit, which may also be cut into points round the edge with a sharp garnishing knife.

Soups may be given a decorative touch by using a pleasing colour contrast. Chopped parsley is suitable for a tomato or white purée, chopped mint for pea soup, cooked asparagus heads or green peas for fish soups, small fancy shapes of Italian pastes or dried vegetables for clear soups.

Even the usual trimmings of lemon and parsley can be tastefully placed on whole fish such as turbot or plaice served hot. The lemon should be cut into very thin half slices which overlap each other down the centre, broad way on, and down the sides are placed so that the semicircles make a scalloped edge to the fish resting on a parsley border.

Decorating Cold Service Dishes. Mayonnaise of lobster or salmon lends itself to effective dishing. The sauce may be reddened with the aid of tomato puree or greened with vegetable colouring. A flower design can quickly be made by using beetroot out into thin petals for red flowers and shredded almonds for white petals, with yolk of egg for flower centres, pieces of cucumber peel or gherkin can be cut for leaves or stalks, while capers maybe used for buds. A basket effect for the flowers can be made with crossed strips of anchovy. Such finishing touches bring distinction to a buffet supper party or a summer luncheon. Aspic jelly cut into leaves supplies ornament for galantines and pressed beef, together with vegetables, cut into dice and stars, and butternut through a forcer.

Cold sweets such as flans, trifles and fruit jellies can be decorated in much the same way as cakes, except that whipped cream may be more lavishly used. Besides patterns made from crystallized fruits and angelica (q.v.), crystallized flowers are a suitable decoration in such cookery and also for chocolate and other confectionery. These flowers can be obtained at any good grocery store, and they need to be of good quality, inferior preparations often being either faded or are too highly coloured.

The process of crystallizing requires care and some knowledge of sugar boiling, but it is not too difficult to be done at home. Rose petals, orange flowers, lilac, cowslips and violets may all be crystallized. A simple method is to pour over the flower or flower petals a cooled syrup made from refined sugar and water, allowing 3 lb. sugar to each lb. flower petals. The syrup must be boiled to 230°. Then place the petals in a cool oven; when they begin to candy lift them out on to tray and sprinkle with sugar.

Such flowers with candied fruits cut into small pieces form effective decorations with thin strips of angelica arranged to resemble stalks and leaves. Chopped nuts that are sprinkled with a little colouring liquid are also useful.

Ornament for Cakes. For Christmas or birthday cakes any greeting can be written on the top of the cake with the aid of a forcing tube and a little icing. Candle-holders in sugar icing are obtainable for children's birthday cakes in the form of tiny roses. Large decorated cakes usually have a groundwork either of royal or French icing before the ornamentation is arranged in place.



Decoration. Cake ornamented with flowers in icing.

If crystallized fruits and flowers form the main decoration, what little piping is required should harmonize with the colours of the fruit or flowers. When decorations are laid on the icing they will adhere if it is not quite dry, otherwise they must be fastened with a small portion of royal icing or joined by piping in a pattern. Chopped nuts are secured with warmed jelly or jam lightly brushed over the cake before they are sprinkled on.

Sandwich or layer cakes have a cream or rich filling between each layer of cake. French or butter cream icing forms the covering, and they are decorated in a manner suitable to the distinctive character of the flavouring. A walnut cake, for instance, would have halves of walnut to ornament it, or a coffee cake would be finished with coffee icing.

Almost any description of icing can be ornamented with a fancy piping, silver dragees, coloured sugars or comfits. Almonds and pistachios sliced and formed

into the petals and leaves of flowers are attractive. Small cakes may either be baked in various-shaped little tins or may be cut out of a slab of Genoese, sponge or chocolate mixture, and the trimmings formed into Russian cake. Small portions of the Genoese may also be shaped, moistened with sherry, coated with marzipan and coloured to resemble such fruits as apples and peaches, with pieces of almond or angelica for stalks.

DECORATION: IDEAS FOR THE HOME

Some Aspects of the Trend of Style

For further information see the articles Ceiling; Painting; Panelling; Paperhanging. See also Christmas; Colour; and the entries on Adam Style; Chippendale Style; Queen Anne Style, etc.

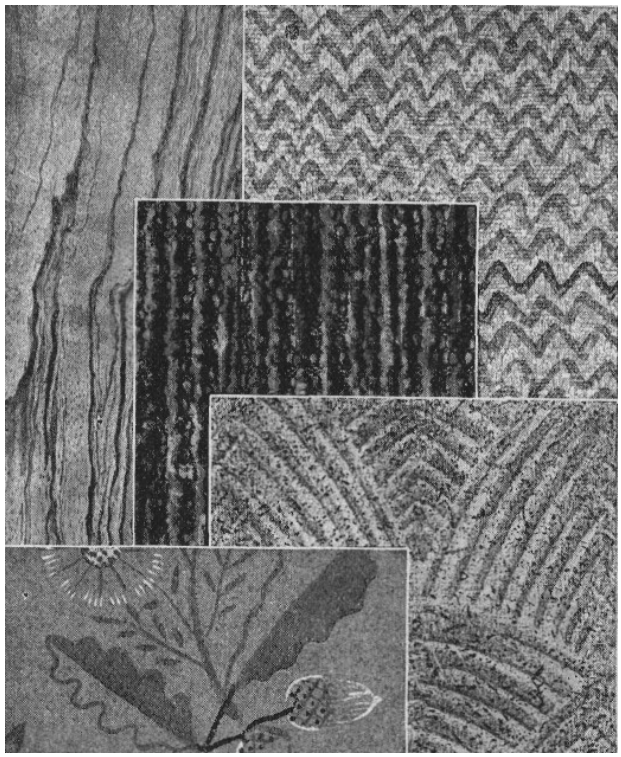
Never before this period has there been such a general interest in attractive homes and such conscious desire to achieve good interior decoration by simple means. It is in the comparatively small houses and flats that the great movement towards practical beauty is being quietly carried on. To-day, as in the day of Robert and James Adam, beautiful houses are being designed—equally expressive of our time as theirs were of the 18th century. Built and decorated by noted architects, in spite of their costly nature such houses are not so far removed to-day from general appreciation as their prototypes were then. They are described and pictured in magazines and papers, while the ideas and designs originating in these buildings percolate through the brains of the army of artists and workers in the decorative trades. These in turn all help to place quickly on the market, by the aid of modern machinery, effective adaptations which will be within reach of the ordinary homemaker.

Sometimes old houses are reconstructed beyond recognition inside and out, or the architect-decorator will merely get rid of offending interior features and bring all else into, a pleasing scheme by clever adaptations and innovations suitable for life to-day. Again these useful and beautiful ideas are handed on for inspiration to the many.

Architectural Decorations. In quite a number of the small recently built houses architects have made the choice of decorations, and even of furnishings, comparatively simple. Natural and artificial lighting has been considered, also the well-balanced heights of ceilings, and doors, and the sizes and shapes of windows. Where there is a horizontal line of panelled dado it is frequently continued in built-in cupboards, fireplace and corner seat.

In another type of room with light, painted walls, bookshelves are a decoration in themselves. They are placed either side of the chimney piece in recesses, the tops of which are architecturally designed to suit the style of the furniture, and the back of the shelves and borders of the recess painted in a colour contrast to the walls and to match the skirting. Such recesses, or built-in cupboards with glazed doors, somewhat reminiscent of Queen Anne style, are also utilized in dining rooms to hold glass and china, and a delightfully decorative touch is given to them, especially if they are placed in dark corners, by an inside coating of silver paint, the silver note being repeated elsewhere in the room in lighting fittings, curtain trimmings, or other paintwork. In yet another style the architect will, with utmost severity, insist on square effects, even refusing architraves to doors and windows and a shelf to the chimney piece, but making up for this by beauty of texture in woodwork and flooring.

A home to be lovable and livable in to-day cannot be like a museum, however keen the owner is on a period style. On the other hand, not to avail oneself of the rich heritage of past beauty in architecture, decoration and furnishing designs is to be either lacking in culture, or an extremist in the craze for startling novelty at all costs. Strictly period rooms become absurd when provision has to be made for the wireless, the gramophone, the radiator, or even the telephone and electric lighting fixtures, while there is something too unfriendly to most homeloving people in the room of squared lines, the elimination of all gracious movable furniture, and in substitutes reminiscent of ship's cabins and saloons.



Decoration. Papers of various designs and textures. Top left: imitation pine. Right: green wavy lines on silver, vertical grain. Centre: imitation folk-weave in browns and fawn. Lower left: modern flower design, red and green on beige. Right: scraped gold and cream, washable. (Courtesy of Sanderson & Co.)

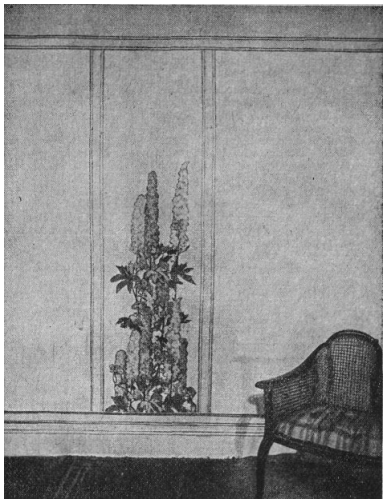
Texture as Decorative Patterns. Apart from extremes, one of the pleasantest things about the various materials now largely employed in decoration is that they can form beautiful backgrounds for

genuine old furniture, for reproductions, for Oriental pieces and for modern chairs and tables. There is already a breaking away from startling colour schemes —except on rare occasions when the furniture demands it, in the extra sitting room where experiments are interesting, and in otherwise gloomy halls, where such decorations may be cheery and inviting and do not weary the inmates of a house as they might in a living-room in constant use. Another exception is when brilliant wall paintings are executed by a mural artist, but such a decorative treatment is necessarily rare in the ordinary home.

Colour for decorations should be pure and beautiful. The trend is away from fierce contrasts or primary hues— except here and there as colour notes— and towards delicate blendings, tone-in-tone effects in woven fabrics, marbled, mottled, grained, blurred texture effects in paint, woodwork, plaster, wallpapers and floorings. Pale colours are usual, but white is no longer considered helpful in the decoration of ceilings, friezes or woodwork. Rough surfaces, which respond to the play of light and shade, are seen above pine panelling, stripped and waxed. Where walls are painted, a subtle colour pattern is sometimes obtained by an undercoat of a deeper shade than that eventually required, and over this two thin coats of white paint, which in turn is rubbed down to let the original colour show through at the edges of panels and on mouldings. Marble texture is imitated, or two shades of a neutral tone are stippled, to give variety to the walls; or again the grain of a wood is copied by means of paint or reproduced in wallpaper designs. Surfaces are not merely flatly covered, but interestingly broken up by patterns founded on texture.

Motifs and Pilasters. Wallpapers, too, have advanced in practical use and beauty, and are now obtainable in really washable varieties. For those who do not wish for the expense of painted walls, there is the choice of a patterned paper in one of the simple restful designs, using a paler shade of the ground colour with which to distemper the ceiling; or a paper in a mottled, flecked or woven texture effect may be selected in a cream or pale shade with an applied decoration. The first illustration shows various textures and patterns of modern wallpaper with which intricate colour schemes may be built up. Large designs and bright colours are well suited to the proportions of large rooms. Strong contrasts are often helpful in a poorly lighted room. *(See* Colour Schemes.) Here modern wallpaper can be most valuable: choose a paper containing several colours and an interesting motif, repeat these in paintwork, chair covers, curtains and carpets, and you have a surprisingly harmonious room. Nature provides endless suggestions for such schemes.

The other illustration shows a panel, or pilaster, which can be placed to create interest where desired. The styling, or strips, with which such panels are bordered is obtainable with an outline of gold to emphasise a gold-flecked wallpaper suitable for the decoration of a charming sitting room with paintwork in the softest shade of delphinium blue. These pilasters are also designed with other tall flowers, such as foxgloves. Plain wall space is essential on either side of such a decoration, which should not be overdone—two pilasters in a small room may be sufficient. Applied decorations can also be obtained which are cut out to form central sprays for simulated panels, or groups as skirting or frieze borders. Motif sprays for corners of walls and extending over the ceiling corners may also be used with decorative effect, but discretion is necessary in blending the whole scheme of the room harmoniously, or such ornamentation may be disturbing rather than pleasing.



Panel effect obtained upon a gold-flecked wallpaper by an applied decoration of delphiniums. The borders are outlined in gold and should have plain wall space on either side. All paintwork is in soft blue. (Courtesy of Sander-son & Co. and Tho-mas Wallis & Co., Ltd.)

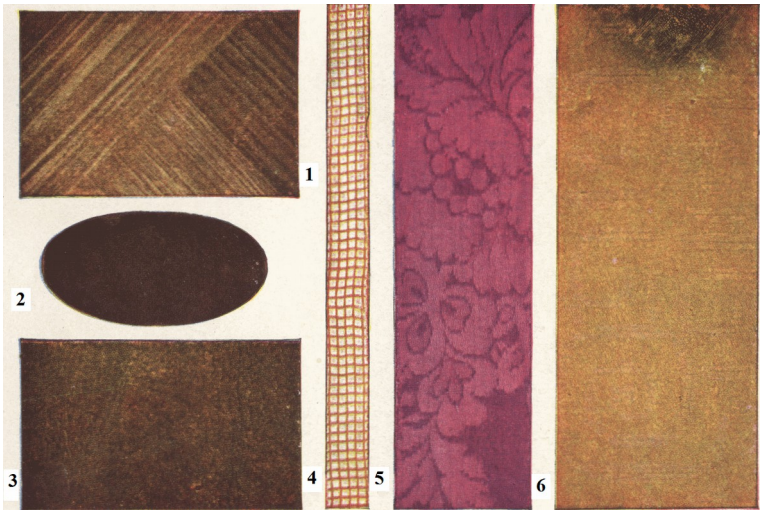
DEED: In Law. A deed is a document which is sealed and delivered by the person or persons executing it. A deed is necessary for a lease of upwards of three years; for a conveyance of land; and for a contract or promise made without valuable consideration. By valuable consideration is meant money or money's worth, and future but not existing marriage—marriage is always reckoned valuable consideration. If a husband desires to settle anything on his wife after marriage, it should always be done by deed.

The sealing of a deed is generally done by a wafer or piece of sealing-wax being affixed to the paper or parchment, the maker of the deed touching it with his finger; but this, though advisable, is not necessary.

In addition to sealing, a deed requires delivery before it becomes operative. By delivery is meant that the maker of the deed parts with it unconditionally. So that if anyone signs and seals a deed purporting to sell his house, and hands it to his solicitor, not to be parted with by him until he gets the money, there is no effective delivery of the deed; it is only delivered when the solicitor hands it over to the purchaser or his agent in exchange for the money. *See* Agreement.

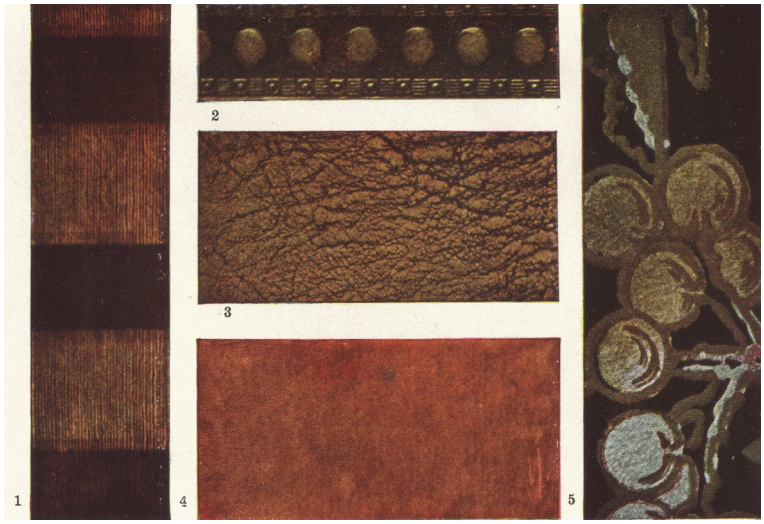
DEERHOUND. The deerhound is a member of the greyhound family, resembling the coursing dog in general lines, but of more robust build, and standing several inches higher. The coat is shaggy, harsh and

(Continued in page 631)



Dining Room.

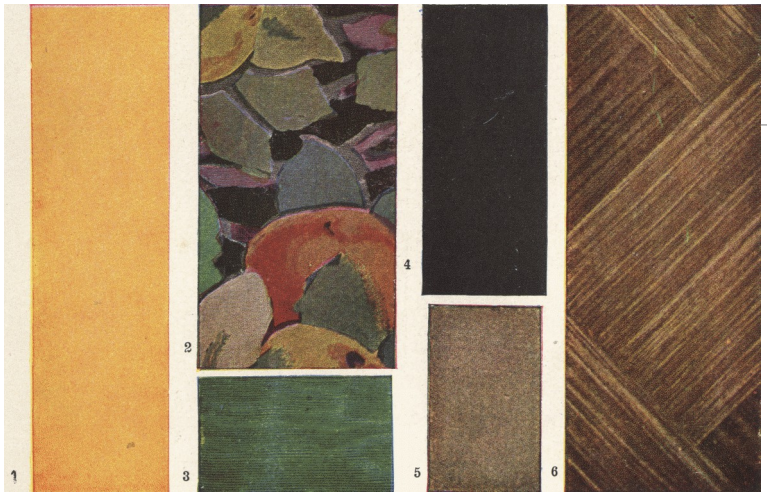
1. Floor parquet block.
2. Brown velvet, and
3. Brown leather for upholstery.
4. Gold curtain net.
5. Wine damask curtains.
6. Gold wallpaper.



Lounge Hall.

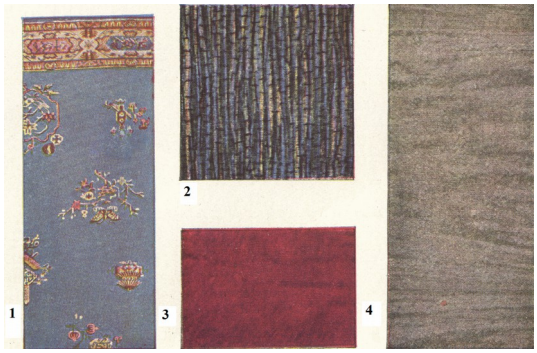
1. Curtains, brown and gold velvet.
2. Imitation leather beading and
3. paper.
4. Orange carpet.
5. Black, gold and blue tapestry for upholstery.

Colour: Schemes for the decoration of the main rooms of the house.
(Colour photographs from materials supplied by Waring & Gillow. Ltd.)



Sitting Room.

1. Yellow walls and ceiling.
2. Covers of printed linen.
3. Malachite green curtains appliquéd and lined.
4. black.
5. Camel pile carpet.
6. parquet surround.



Bedroom.

1. Blue carpet patterned rose.
2. Slub silk rep in shot blue, grey and rose for upholstery.
3. Silk taffeta curtains.
4. Painted woodwork.

wiry, the length being about 3 or 4 in. A soft, woolly coat is undesirable. A dark blue-grey is preferred, but also recognized are dark and light greys, brindle, yellow and sandy-red or red-fawn. White often appears on the chest or toes, but it is not liked, and a white blaze on the head or a white collar would disqualify in the show ring.



Deerhound. A fine specimen of this graceful breed. (Photo: Ralph Robinson)

The front legs must be perfectly straight, hind legs well bent, with great length from hip to hock, very deep chest, and a well-arched loin. The neck should be long and shoulders sloping. Deerhounds are somewhat delicate as puppies, but when once through distemper they are hardy. A dog measures from 28 in. to 30 in. at the shoulders, bitches being usually about 2 or 3 in. less. *See* Dog.

DEFORMITY. A departure from the normal shape or position affecting the body, or any part of it, is a deformity, e.g. dwarfism, spinal curvature, club foot, wry neck, fingers in excess of the usual number, hammer toes, etc. Deformities may be congenital, or may be acquired in the course of life through injury or disease. In addition to unsightliness, most deformities interfere to a varying extent with the proper function or use of the part. Various methods of treatment may be adopted according to the nature of the case, including operations, the use of an apparatus, exercises of all sorts, massage, electricity, etc. *See* Artificial Limbs; Club Foot; Hammer Toe, etc.

DELAINE. Originally called mousseline delaine, or wool muslin, delaine is not invariably all wool. The weave is plain, the fabric is crisp to the touch, and usually bears a printed design somewhat like a cotton voile. The crispness is the outcome of a chemical process which makes the fabric nearly unshrinkable.

Good delaine wears well, and does not easily soil; it creases less and is warmer than cotton. Used as casement curtains, it requires washing less often than cotton.

Delaine requires careful washing if it is to retain its softness. Launder in the same way as flannels, and in order to brighten up the colour add a little ammonia to the last rinsing water. Iron delaine while slightly damp.

DELFT WARE. As introduced at the Dutch town of that name in the 17th century, Delft ware was a soft-paste faience with a tin-enamel surface which skilfully imitated the effect of Chinese porcelain before it was successfully reproduced in true glazed hard-paste china at Dresden. The secret of real Delft is the tin-enamel, usually painted in blue on the white surface while still soft. Its vogue lasted to the end of the 18th century, when it was displaced by the technical improvements of the Staffordshire potters.



Delft. Dish of Dutch earthenware, Oriental design, dating from the 18th century (Victoria and Albert Museum)

The earliest pieces, in red clay, had biblical and rustic scenes in blue, or blue and purple. Some excellent work was produced on a yellow or pale-brown body, enamelled in rich colours, with polychrome imitations of Japanese designs. Old Delft is recognizable by its smooth enamel, which seldom crazed, whereas modern Dutch tiles are ordinary glazed earthenware. Among more than 150 marks, mostly initials, dates and other devices, only one shows the place-name.

The manufacture of enamelled Delft became popular in England early in the 18th century, before porcelain was attempted. The first in the field was Lambeth, whose fabric was harder, coarser, and with a more opaque, enamel than Dutch. From this it can be distinguished by its being decorated after firing the enamel, by its rosy tinge, and by its slight glaze.

The Delft ware which started later at Bristol often has a bluish-green tinge in the thin enamel. Chinese imitations were favoured styles, and fireplaces were adorned with pairs of dog and cat pictures, each of nine tiles. Liverpool later still produced Delft ware. *See* Faience; Lambeth Ware; Liverpool Pottery.

DELIRIUM. The state of mental excitement occurring in acute febrile disorders, e.g. pneumonia and other conditions, is known as delirium. The onset may be sudden, or to begin with the patient may talk in his sleep and may be somewhat confused when he wakes. He fancies he sees strange things about the room. If spoken to he may answer apparently rationally, but almost at once he wishes to talk of his fears and fancies. All this time he is tossing restlessly, and may attempt to get out of bed, and too often such patients have managed to throw themselves out of a window. He may imagine that someone in attendance on him is an enemy who is attempting to do him an injury, as by putting poison in his food. This state may go on for some days, and then the patient begins to sleep and may wake up more rational.

Children who are fevered become delirious very easily, but this need occasion no undue alarm. Delirium may come on after severe injuries in healthy people quite apart from any addiction to alcohol. It begins after about 48 hours and is usually associated with septic poisoning. Poisoning with belladonna and

similar drugs almost always produces this condition. Acute delirium, or Bell's mania, is a form which affects women mainly, and a family history of insanity is common.

The treatment will be supervised by the doctor. The room should be kept well aired, darkened, and as quiet as possible. The patient must be constantly watched, lest he do harm to himself or anyone else. Sponging with warm water, a pack, or, when practicable, a warm bath, are useful soothing measures. The forehead may be bathed with vinegar and water, or an ice bag may be applied to the head. A sleeping draught may be necessary. The diet should be fluid.

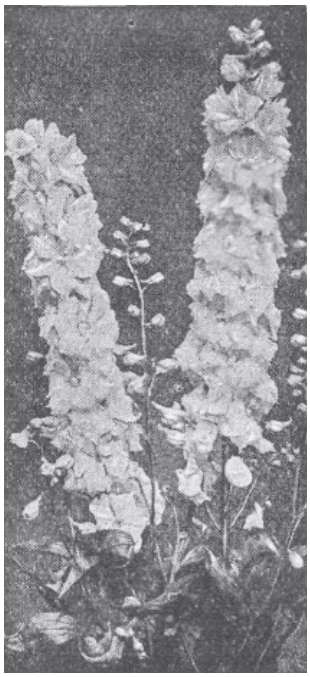
Sometimes active delirium passes into what is known as the typhoid state, and this also occurs apart from previous active delirium at the end of any severe illness when the vital powers are sinking low. The patient lies with the eyes half open and keeps muttering to himself. The fingers are constantly picking at the bed-clothes, and he may make movements in the air as if he were attempting to catch imaginary flies. The tongue is dry and covered with brown fur. Here the whole aim is to maintain the patient's strength. Nourishment, in liquid form, must be given at short intervals night and day. The sick-room must be aired, but it should also be warm, and hot water bottles must be used if necessary, especially in the early hours of the morning.

DELIRIUM TREMENS. This is an acute temporary insanity developing in the habitual drinker. The common symptoms are delusions of a suspicious and fearsome character. There is a constant babbling or shouting, a trembling of the hand and tongue, and inability to sleep. The patient struggles violently with his attendants, and frequently resists all attempts to feed him. Occasionally there is fever, the pulse is weak, and finally the patient may pass into a state of dangerous exhaustion.

Every effort must be made to make him sleep. He should be kept flat on his bed, if necessary by straps or long bath towels, tying down his arms and legs to the sides of the bed. Unremitting observation and care are essential, as if left to himself the patient may commit suicide, or do some act of violence to another person. He must be carefully guarded from chill and exposure, and his strength kept up by giving every two hours small amounts of strong soups, meat broths, and milk. Chloral or some other hypnotic may be required to induce sleep; but such a remedy will only be used by the doctor's direction. An attack of delirium tremens usually passes off in from two to three days under appropriate treatment.

DELPHINIUM (Perennial Larkspur). The delphinium is one of the most beautiful of all hardy herbaceous perennials. The plants grow from 3 to 6 feet, or more, high, and bear tall spires of bloom in shades of lavender, blue, purple and mauve. They should be planted in autumn or in spring in deeply dug and well manured soil and left undisturbed for many years. If an increased stock is required it is better to raise seedlings from seeds sown in frame or greenhouse in March than to disturb old plants. Or the young shoots may be taken off in spring, when about 3 inches high, for insertion as cuttings in pots of sandy soil under a propagating case in frame or greenhouse. When well developed, delphiniums make a magnificent show and are in full beauty in June. An annual top-dressing of manure in spring is beneficial. When the young shoots are pushing through the soil in spring they are apt to be eaten by slugs. A layer of ashes placed round about them affords protection from these pests.

There are two chief types of delphinium, the tall, vigorous varieties, and those of the belladonna type, which are of branching, slender growth and 3 to 4 feet high. Beautiful varieties of the latter are Capri, sky blue; Lamartine, purple-blue; Moerheimii, white; and grandi-florum, light blue.



Delphinium. Double variety of this handsome border plant.

Varieties of the vigorous tall-growing delphinium are innumerable and every year fresh ones are introduced. The following are particularly fine: Blue Boy, blue; Millicent Blackmore, light blue and mauve; Mrs. Townley Parker, blue and white; Sir Douglas Haig, dark blue and purple; Rev. E. Lascelles, dark blue and white; Nora Ferguson, light blue, mauve and rose.

The annual delphinium, popularly called larkspur, is raised from seeds sown out of doors in March-April where the plants are to bloom in summer. They reach a height of 2 to 3 feet and have flowers of various colours. One of the most beautiful is the rose-pink variety. *See* Border.

DELTA METAL. The alloy known as delta metal, and noted for its strength and toughness, consists mainly of copper and zinc with some iron and tin. It can be cast, drawn, or rolled, and can be forged at a dull red heat. When finished it takes a high polish, and does not tarnish so readily as brass, nor is it so susceptible to verdigris. Delta metal is used in the manufacture of certain types of wire rope. When drawn to various sections or extruded, it is suitable for ornamental mouldings found on shop fronts.

DELUSION. In every form of mental unsoundness delusions may be present, arising chiefly from inability to correct the imagination by what should be the

normal judgement. The person drifting into delusional insanity is often at first very suspicious, touchy, and eccentric.

Although delusions are of inlinite variety, they roughly group themselves into two classes—delusions of persecution and delusions of exaltation. To the former class belong those of the person who thinks that other people are conspiring to injure him. A man in this state is often very dangerous, for he may attack anyone whom he suspects. In delusions of exaltation a person has extraordinary ideas of his own greatness. He may believe himself to be a prophet, a king, the greatest orator, poet, military genius, etc., in the world. Very often these delusions of exaltation follow delusions of persecution.

In the case of old people making their wills, it is often a matter of great importance to decide whether they are influenced by delusions; for a man may believe that he is made of glass, and yet make his will with sound judgement. But if he suffers from insane delusions with regard to the conduct of his relatives or the amount of his property, his will is likely to be faulty. *See* Insanity.

DEMULCENT. White of egg, honey, starch, glycerin, gelatine, liquorice, olive oil, are examples of demulcents used in medicine. Their object is to protect and thus lessen irritation of mucous membranes; so in corrosive and irritant poisoning thin arrowroot or gruel, white of egg, or olive oil is given freely. *See* Gelatine; Honey; Starch.

DENTIFRICE. A preparation for cleaning the teeth may be in the form of powder, paste, or liquid. In the first of the following recipes for a powder the carbolic acid should be mixed with a little of the kaolin in a mortar before adding the other ingredients. It is necessary to sift the powder through a fine sieve. The antiseptic tooth paste is made into a paste with as much as may be required of a mixture of glycerin 4 oz. and water 1 oz.

CARBOLIC

Kaolin, 6 oz.; infusorial earth, 2 oz.; quillaia extract, 1 dram; carbolic acid, 2 drams.

SAPONACEOUS

Powdered white soap, 1 oz.; powdered orris root, 2 oz.; precipitated chalk, 5 oz.; rose geranium oil, 10 drops.

ANTISEPTIC TOOTH PASTE

Precipitated chalk, 5 oz.; powdered soap, 5 oz.; salicylate of soda, 2 drams; rose geranium oil, 30 drops; wintergreen oil, 20 drops.

LIQUID DENTIFRICE

Quillaia bark, 4 oz.; glycerin, 3 oz.; alcohol, 5 oz.; carbolic acid, 1 dram; rose geranium oil, 10 drops; clove oil, 10 drops; cassia oil, 10 drops; tincture of rhatany, 1½ oz.; rose water, 1½ pints.

The quillaia bark, glycerin and alcohol are shaken together occasionally for 4 days and then the other ingredients are added. These are again shaken occasionally for a period of 4 days, and then the liquid is filtered through absorbent paper. A few drops of the liquid dentifrice on a wet toothbrush is used night and morning. *See* Artificial Teeth; Teeth.

DENTIL. Dentils are the small toothlike ornaments found in furniture fashioned by Chippendale, Hepplewhite, Sheraton, and their imitators. Sometimes each tooth is cut away in the centre, thus leaving a raised or filleted edge, and less frequently there are dentils which are deeply undercut. One of the most frequent blemishes found on pieces of furniture of the late 18th century is the absence of a few of these dentils, which have been knocked off through careless handling.

DEODORANT: Its Uses. Substances which mask or absorb foul odours are termed deodorants. Examples are smoke from brown paper or tobacco; perfumes like eau de Cologne; oil of eucalyptus and thymol; hydrogen peroxide, wood charcoal, potassium permanganate and chloride of lime. *See* Antiseptic; Disinfectant.

DEPILATORY. A preparation that is used for removing superfluous hair is known as a depilatory.

Barium sulphide is the active principle of most of the depilatories on the market. The following is a simple prescription, cheap and readily made up:

Barium sulphide	2 parts
Starch	4 „
Orris root	2 „

Make a little into a paste with water and apply to the hairy parts. Leave on for 5 min., or until the skin begins to tingle slightly, then scrape off with a bone knife and wash the part with cold water. Dry, and apply a little boracic ointment or cold cream to the skin.

The treatment may be repeated from time to time as the hairs grow again. The paste should not be left on longer than 5 min., and it should not be persisted with if it causes irritation of the skin. With shaving, it shares the disadvantage of possibly making the hairs grow stronger and stiffer. *See* Electrolysis; Hair.

DEPOSIT: Of Money. A deposit is a sum of money placed in a bank with the intention that it shall remain there for some time. This distinguishes it from money put into a current account. Banks give receipts for money taken on deposit and pay interest on it, generally 1 per cent, below bank rate. Money placed on deposit cannot be drawn out by cheque, nor usually without notice being given. In another sense a deposit is a sum of money paid down when a contract is made to show that the purchaser is in earnest and as a guarantee that he will carry out his share of the undertaking. It may take the form of 5 or 10 per cent, on the amount of the purchase money. *See* Banking; Contract; Savings Bank.

DERBYSHIRE NECK. This name is sometimes used for the complaint known as goitre. It was believed to be specially prevalent in that county, and was due to the peculiar properties of the water. *See* Goitre.

DERMATITIS: A Skin Affection. The general name of dermatitis is used to denote any inflammation of the skin. The area affected may be reddened, swollen, hot and painful, as is the face after severe sunburn; but in other cases more or less numerous papules appear. These may be small, like pimples, or considerably larger; or blisters may be found, a small blister being known as a vesicle and a large one as a bulla. If a vesicle is filled with pus or matter it is described as a pustule. After the skin has been reddened, with or apart from the formation of papules, it may become scaly if vesicles or pustules are present they will dry up as crusts or scabs. Itching may possibly accompany any of these changes.

Some forms of inflammation are given distinctive names. A chronic inflammation with papules covered by silvery scales is known as psoriasis. Grouped vesicles such as often occur at the corner of the mouth with a bad cold constitute herpes, and inflammation which is characterised by large bullae is styled pemphigus. Eczema is an inflammation of the skin in which the skin is reddened and in which papules, vesicles, and pustules may all appear.

The term dermatitis is used in speaking of inflammation when it has been produced by a definite known agent. This may be heat, light, X-rays, cold, drugs taken inwardly, e.g. bromides, iodides or arsenic. It may be due to the action of poisonous plants, e.g. some primulas or poisonous ivy when they come into contact with the skin, or the handling of irritating substances in the course of many occupations, as by paraffin workers, steel grinders, etc.

Other forms of the condition are dermatitis exfoliation, in which the skin all over the body throws off crops of large and small scales; dermatitis herpetiformis, so called because its inflammatory manifestations tend to be grouped like the vesicles in herpes; and seborrhoeic dermatitis, in which rounded reddish or salmon-pink scaly patches appear on the back, chest, face or elsewhere. It is associated with dandruff. Much may be done by scrupulous cleanliness to prevent the occupational form of the disease. Unless the case is very slight the doctor should be consulted. In slight cases zinc ointment may be useful. *See* Eczema; Skin.

DESENSITIZER. Desensitizers are substances which reduce the light sensitivity of photographic emulsions. Their chief application is in the lowering, before or during development, of the high speed of modern negative materials, so that these may be developed without risk of fog in a light of greater brightness than that which must be used for the non-desensitized materials. Panchromatic plates and films, for example, are so colour sensitive that normally they have to be developed in darkness. After desensitizing, however, development can be carried out in a light of sufficient brightness to enable the operator to see the development process clearly.

The ideal desensitizer should be a stable, colourless or non-staining substance, without any harmful action on the exposed plate or film, and should be equally effective in solution as a fore-bath or as an addition to the developer. This ideal desensitizer has still to be found, but a few practical substances are available commercially, the most widely used being Desensitol (marketed by Ilford, Ltd.), Pinacryptol Green and Pinacryptol Yellow.

Desensitol stains the negative a deep red, but this is got rid of by increasing the period of washing; a faint pinky stain does no harm to the negative beyond increasing the time in printing. Any difficulty in getting rid of the red stain can be overcome by the addition of an acetic acid and alum clearing solution to the fixing bath.

Pinacryptol Green is an efficient and rapid desensitizer, and shows little tendency to stain. Its disadvantages are a tendency to cause chemical fog and slight loss of image density. Pinacryptol Yellow is probably the most successful desensitizer, being rapid and powerful in action, with no staining action, and can be used safely with colour plates or films.

Remember, however, that no desensitizer destroys completely the original sensitivity of the photographic material. *See* Developing.

DESERTION: In Law. In England, desertion for three years is one of the grounds for divorce by either husband or wife under the Matrimonial Causes Act, 1937. If a wife is deserted at all, she is entitled to an order from the magistrates for maintenance. A husband who goes abroad temporarily on lawful business, or State service, though absent for three years, is not guilty of desertion, because it must be proved that he has deserted (i.e. abandoned) his wife, and not merely that he has been absent from her, which absence may have been due to business or some other perfectly legitimate reason.

A father who deserts his children can be summoned for not maintaining them, provided they are under 16 years of age or are, by reason of infirmity, whether mental or bodily, incapable of maintaining themselves. *See* Child; Cruelty; Divorce; Separation Order.

DESICCATION. This manufacturing process is applied to articles of food to render them suitable for storage. All moisture being extracted, the articles are considerably reduced in bulk. Desiccated coconut is the commonest commodity thus produced.

DESK. In its origin a desk is a table for writing on, some being flat and others sloping. While the plain form was retained for use in schools, something more elaborate was introduced into the home. A drawer was added, and there are some fine examples in which the table with a single drawer beneath it is supported by carved legs or columns. Some beautiful pieces of this

type were made in Buhl work. From this the familiar writing-table was evolved, the pedestals or supports being formed by drawers, one upon another, on either side, leaving a space for the knees between.

The bureau is one form of desk, while another is the roll-top desk, the idea of which originated in France in the 18th century. The bureau du roi, which has been described as the finest piece of furniture in existence, is of this type. It was made for Louis XV by several of the greatest artists and designers of the day, and is now in the Louvre. *See* Bureau; Writing Table.

DESPATCH BOX. A despatch box is made of tin or sheet metal, and usually contains separate compartments for stationery and a lift-out tray, beneath which is a space for storage of important documents. The best qualities are fitted with a reliable lever lock, and have a rolled edge reinforced with an iron or steel bar and a strongly fitted bottom. The lid in particular should be stiff and ridged.

Another type of despatch box is strongly made of leather, and usually fitted with an inkwell, blotting-pad, spaces for pens and pencils, and divisions for paper and envelopes. These are more appropriate when travelling or for personal use.

DESSERT: How to Serve. The last course at dinner is often omitted when the meal concludes with a sweet of the fruit salad or ice type, but where a savoury is included in the menu, dessert usually follows.

In winter, when flowers are scarce and expensive, fresh fruit in ornamental dishes of pottery, china, glass or silver, or in gilt baskets, forms a charming table decoration. A centrepiece can be arranged with mandarins and ordinary oranges (supplies from West Indies and South Africa are sweetest), pale, shiny, yellow Newtown pippins, a few brilliantly crimson apples for contrast, russet winter pears, and bunches of black and white grapes.

In addition, for the ordinary dessert, a dish containing either pulled figs, almonds and raisins, crystallized fruits, or French plums or dates with walnut or marzipan stuffing, and one of nuts, with two smaller dishes of chocolates and fancy sweets, would be sufficient; but for a larger party a pineapple and a dish of South African cherries might be added. Ginger preserved in syrup is best served in its own jar. Salted almonds, which may be bought ready prepared in bottles, are always popular, so also are a few small silver dishes of marrons glacés and other bonbons.

In summer the more juicy fruits should be arranged in separate dishes. Strawberries may form a complete course. Remove the calyx from each berry, pile them in shallow bowls and serve them with cream and sugar.

Dessert Services. The charm of this course is greatly aided by attractive ware. A service usually consists of six or 12 plates and three or five fruit dishes. In old china it is often highly decorated, Coalport, Worcester and Crown Derby services being unexcelled

The old green-leaf service (vine or lotus is the usual pattern) can often be picked up more or less complete at a bric-à-brac shop, and has a decorative value with its malachite green on a polished table. Venetian glass services are beautiful and costly, and there are other glass varieties in plain crystal, coloured or gilt patterned at more moderate prices. Italian fruit-painted pottery has a gay appearance, and there are many good varieties of English china and semi-porcelain fruit sets.

Dessert sets of knives and forks can be obtained with twisted pearl handles, plain or filigree encased. Green-stained ivory and silver gilt also make a good handle, also black, silver mounted. A dessert set comprises a dozen pairs. *See* Cutlery; Silver; Spoon; Table.

DESTRUCTOR. A furnace which is used by a district for burning up its refuse is known as a destructor. The refuse burns itself; the heat provided may be used for generating steam, and the ashes, which are known as clinker, have various uses. Small destructors may be used in the home, but their power of consuming refuse is very much less than the large ones, and in any case the kitchen fire is usually able to burn up domestic refuse. In the case of a large house and garden, a small destructor in the grounds is of value to deal with the garden waste and all house refuse as well. *See* Refuse.

DETECTOR. A device that is essential to the operation of a broadcast wireless receiver. Its purpose is to change the high-frequency current that is generated in the aerial by the broadcasting station into the low-frequency impulses which are needed to work headphones or a loudspeaker.

In many sets the high-frequency current is amplified in "H.F. stages" before being passed to the detector. Either a thermionic valve or a crystal detector may be employed. The crystal, although simple and economical, is comparatively inconsistent in its action, whereas the three-electrode valve or triode is both consistent and sensitive.

Among the various methods of valve detection are leaky or cumulative grid, anode or lower band and diode rectification. A leaky grid detector utilizes a fixed condenser having a value of ·0001-·0003 mfd., and a grid leak which generally has a resistance of 1 or 2 megohms. One end of the grid leak is usually connected to a point in the circuit at positive potential in respect to earth. In the case of an anode bend detector a negative potential of 1½ volts or more is applied to the grid of the valve, and a grid leak and condenser may or may not be employed.

The diode detector is very efficient in regard to quality, for it provides detection with a minimum of distortion. But it is relatively insensitive and, therefore, its use is normally confined to super-heterodyne and other such sets as employ a considerable degree of H.F. amplification. *See* Broadcast Receiver; Valve.

DEUTZIA. This is a beautiful, easily-grown hardy flowering shrub. Deutzias thrive in ordinary well-tilled

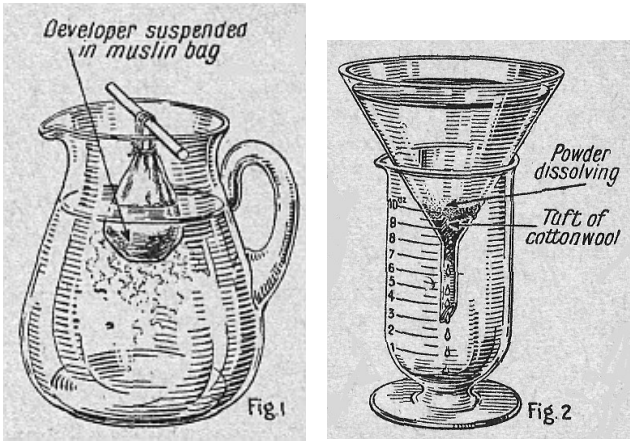
soil and benefit by being top-dressed with manure annually in spring. They are pruned by thinning out the oldest shoots as soon as the flowers have faded. A few of the best are gracilis, scabra, crenata and corymbosa, all having white flowers. The best pink-flowered kind is longifolia veitchii, and magnifica has double white flowers. Several noteworthy large-flowered sorts have been raised; some of the best are candidissima, magnifica, and Pride of Rochester. Deutzia gracilis is a favourite shrub for forcing; if potted in early autumn and placed in a heated greenhouse in December it will be in full bloom in the springtime.



Deutzia. Flowering spray of D. crenata, a hardy shrub.

DEVELOPER: In Photography. So far as all ordinary plates and films are concerned the selection of a developer is principally a matter of convenience. Any good standard developer, used correctly, will give similar printing results. Some stain the negative, others give a good black-looking negative, but so long as development has been properly carried out the result in print or enlargement will not vary to an appreciable degree.

It is a sound plan to select a developer and adhere to it. Uniform results cannot be expected and failures must be increased if the amateur repeatedly changes his developer.



Developer. Two practical methods of dissolving developers or other photographic chemicals.

In dissolving powders, tablet developers or other photographic chemicals, useful methods to adopt are shown in Figs. 1 and 2. As the solution is formed it falls and fresh water is continually coming into contact with the powder until the solution is complete. The method shown in Fig. 2 is particularly suitable for the solution of amidol, pyro and metol, filtration being effected at the same time. These developers are not easily soluble, and if undissolved particles are permitted in the dish bad spots will occur in the negatives.

Here is a brief account of the normal characteristics of the best-known developers:

Amidol. Requires no alkali. An excellent general-purpose developer for negatives or bromide papers. Gives soft negatives and good blacks in bromide prints. This developer will not keep in solution.

Glycin. Free from liability to stain or fog. Excellent for the development of warm tone chloro-bromide papers, and for miniature films on account of its fine grain qualities.

Hydroquinone. Used in combination with metol, when it is popularly termed "M.Q.," this is a universal developer for both negatives and positives of all kinds. Cannot work satisfactorily at a temperature below 65° F. Good for maximum contrast.

Paraminophenol. Commercially prepared formulae of this developing agent are sold under the trade names Azol, Certinal and Rodinal. Image inclines to delicacy rather than contrast.

Pyrogallic Acid. "Pyro" as it is usually called is the developer *par excellence* for obtaining a negative of printing strength from under-exposures. It gives a characteristic yellow stain, and so can be used only for negatives.

In all cases formulae for making up developers are given by their makers and also by manufacturers of films, plates and papers.

Once a developing solution is made up it must be used and not kept. Stale developer is certain to give bad results. About 10 oz. of solution is necessary to develop six ¼ plates at one time, and if a further batch of plates is to be developed fresh solution must be used. Amidol, metol and pyrogallic acid must be kept in well-stoppered bottles and not exposed to the air longer than is necessary, to avoid deterioration. *See* Developing; Photography.

DEVELOPING PHOTO PLATES AND FILMS
Methods Which Give the Amateur the Best Results

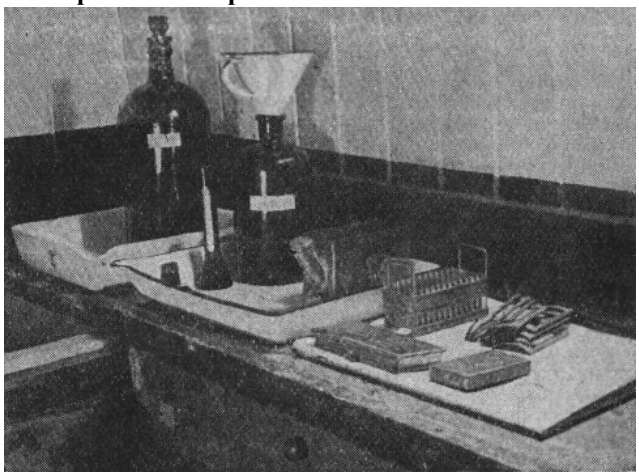
Associated articles are Film; Fixing; Photography; Plate; Washing; etc.

Developing is purely a chemical process, and therefore precision and absolute cleanliness are required, but the systems which have been evolved make it a matter of ease and simplicity. Negatives or films may be developed by one of three methods: by observation, by factors, and by time and temperature.

By the first method each exposure is developed separately in a dish, observing the progress of development by means of a red or other actinically safe light, and judging the point at which development should be stopped. To develop plates or flat films by this method, take the plate from the dark slide or

sheath (taking particular care not to touch the sensitive surface with the fingers) and lay it film side (creamy surface) upwards in the dish; next pour on the developing solution in an even sweep so as to cover the whole surface of the plate as evenly and as quickly as possible. Then rock the dish very gently so that the solution is kept moving over the plate. Care is also taken to see that air bubbles do not cling to the emulsion surface of the plate, since they will cause round holes in the finished negative.

After 3 or 4 min. the progress of development is observed by holding the negative up to the red light and looking through it for a second or so. It must be viewed by transmitted light in this way, since in most cases it will appear black in the dish, and all signs of the image will have disappeared some time before development is complete.



Developing. Fig. 1. Workbench prepared for film pack development by tank. In the foreground: curved sheaths for roll films and rack for plates. The film pack tank holds twelve plates or films. Behind: rectangular container with screw cap for the developer.

This method is one that requires a good deal of experience, and moreover suffers from the disadvantage that with modern fast plates and films the necessary exposure to red light is liable to cause fogging. It cannot be used at all with panchromatic plates, which are specially sensitive to red light, unless a desensitizing solution is used. If development is likely to be slow, cover the developing dish with a piece of cardboard. The edges of the plate which have been covered by the edges of the dark slide should be clear glass when fixed. If they are at all grey the plate has been fogged, the reason probably being undue exposure to the dark room light.

If a flat (not roll) film is to be developed by the observation method in a dish, first fill the developing dish with clean water and immerse the flat film until it becomes thoroughly wet on both sides and fairly limp, then pour off the water and apply the developing solution as is done for plates.

If a roll film is to be developed by hand in a flat dish, do not make any attempt to cut it up before developing, but develop the whole strip at one time. Fill a fairly deep developing dish with developer, say, to a depth of 1. to 2 in., then unwind the film from the spool, cast aside the black paper covering and thoroughly wet the film in the basin of cold water.

After allowing the film to soak for about a minute, take the two extreme ends of the film, one in each hand, so that the film hangs in the form of a loop, like the letter U. Take the film from the water and pass it to and fro through the developer in the dish, raising one hand and lowering the other, keeping up the see-saw movement so that the whole strip of film may be acted upon by the developer. A special type of dish is required.

The Factorial Method. The second and better method is Watkins' factorial development. This consists in noting accurately the time which elapses between the flooding of the plate with developer and the first appearance of the image. This time is then multiplied by a factor for the particular developer used, thus obtaining the total time for development of that particular negative. Since the factorial method presupposes a correctly exposed negative, it has largely given way to the increasingly popular tank method of development, by time and temperature.

Time and Temperature Method. The third, and on the whole the soundest, method for the amateur is that known as development by time and temperature. Makers of practically all the standard developers on the market have now published tables showing the times required for development at different temperatures of all the standard plates.

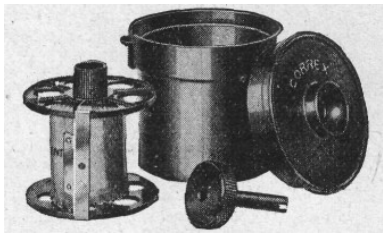
Scientific research has demonstrated that for all ordinary purposes, given a particular plate and a particular developer at a certain temperature, the time required for complete development cannot usefully be varied, whether exposure of the negative has been accurately judged or not. To get good results negatives must always be properly exposed. Under-exposed negatives may be intensified and over-exposed negatives reduced, but the results never equal those obtained from a correctly exposed negative, and no matter how carefully after processes are performed there is always a risk of damaging the negative.

The time and temperature method can be used for either the development of single negatives in a dish or for batches in a developing tank.

Tank Development. A developing tank is a light-tight receptacle in which exposed plates or films can be placed and the necessary developing and fixing solutions poured in and out again without light entering. By this means, the whole process of developing, fixing and washing can be carried out without touching the negatives with the hands, and so a fruitful source of stains and scratches is avoided.

Tanks for the development of plates and film packs, or cutfilm, are usually in the form of boxes of nickel steel or stainless steel, the negatives being loaded into special holders placed inside the box, after which the lid is closed and the solutions poured through a light-

trapped opening. A typical example is the Dallan tank, seen in Fig. 1.



Developing. Figs. 3 and 4. Correx tank with "agitator" for removing air bubbles. Right, film and apron secured by clip are dropped into tank.

Among the tanks used for developing roll-film, one of the best-known is the Correx (Figs. 3 and 4). This makes use of an "apron" of non-absorbent material, the edges of which are corrugated to allow the developer to pass freely between film and apron. Procedure for development is as follows: In the dark room remove the backing paper from the film and insert one end of it under the spring clip fastened to the axle of the reel. Wind on the film quite loosely and clip the other end of the apron to the edge of the reel. The reel with the film on it is then dropped into the bakelite container, and the lid fastened down securely. White light can now be switched on.

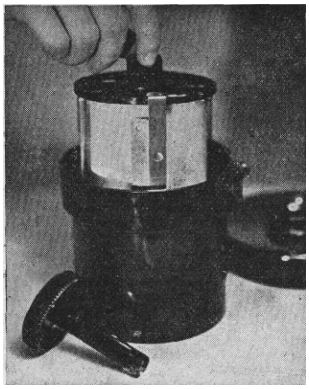


Fig. 4. Film and apron, secured by clip, r dropped into tank. The components (see text for details).

Pour the developer, which should be at a temperature between 65° and 68° F. gently into the tank. When the tank is full, tap gently to dislodge any air bubbles and then from time to time turn the film in the developer by means of the milled knob at the top, in order to prevent "tide marks" on the negative. The time of development is ascertained from tables supplied by the makers of the developer.

When this time has elapsed, pour off the developer, rinse the film with water and then pour in the fixing solution. The time necessary for complete fixation is about a quarter of an hour, after which the film can be taken out of the tank and washed thoroughly in running water.



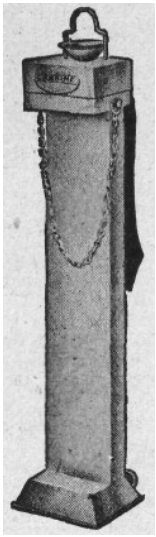
Developing. Fig. 2. Agfa Rondinax tank, which can be used in daylight.

Another type of roll film tank is the Carbine (Fig. 5). The spool in the holder is inserted in the tank previously filled with developer. The lid is put on with the long plunger withdrawn. Next, the plunger is pushed down, extending the film. This tank is practically automatic, very simple, and can be used entirely in daylight. Made in solid brass, enamelled and plated, it has no changing box, apron or grooves. Developer required, about 37 oz.

The methods of inserting, unrolling and treating a film in a tank are very ingenious and vary according to the make of the tank. All makers of tanks, however, supply booklets giving full details.

Stand Development of Plates. For stand development of glass negatives or flat films a large dish is required to take six or more negatives lying flat on the bottom of the dish. The negatives are unloaded from the dark slides (preferably in the dark), the developer having been prepared in a large jug beforehand. Make up plenty of solution so that the negatives are well covered, pour it over the negatives without delay, counting the seconds from the moment that the negatives are wetted.

When all the developer has been poured into the dish make sure that none of the negatives have been disturbed or are over laying one another, and cover the dish with a card or piece of board; take the total of the seconds counted during these operations and, turning on or going to the light, note the time when development began (i.e. when the negatives were first wetted) and the time when, according to the table for the developer used and temperature of the solution, development will be completed.



Developing. Fig. 5. Ensign Carbine tank, for various spools, showing plunger for stretching out film.

As in any case the developer in the dish will acquire the temperature of the room before development is complete, have it ready half an hour or so before it is required and test its temperature just before use.

This will be found a particularly useful method for developing panchromatic plates where no red light can be used at all, and in most cases total darkness is essential. A very little practice is required to gain confidence in handling the negatives in the dark. It is only necessary to have everything conveniently to hand on the bench.

In most cases the tables for time development by the time and temperature method given by the makers of developers and plates are calculated for what is known as "normal contrast." This produces a negative which, if it has been properly exposed gives a print on gaslight paper which has the amount of contrast of light and shade most suitable for the amateur's ordinary snapshots. If the negatives are to be used for enlarging, or if they are portraits, shorter time is needed for development. All that is necessary in the second case is to deduct 25 p.c. We thus get what is known as a thin negative. In general, developers work best at a

temperature between 60° and 70° F. Hydroquinone hardly acts at all below 60° F.

In all photographic work, but particularly in developing, absolute cleanliness of dishes and measures is of the greatest importance. Always wash out dishes thoroughly immediately after use; never leave them until the following morning. It is best to keep separate dishes for developer and fixer. Also, after washing a dish rinse it with a solution of spirits of salt, which can be kept and used repeatedly. By care in these directions mysterious stains and markings can be avoided.

DEVILLING: In Cookery. The name is given to a method of cooking in which cayenne pepper or hot spices are used. The legs of a cooked turkey or chicken are very suitable for devilling. They are first soaked in a sauce prepared from equal quantities of Worcester sauce, vinegar and melted butter, to which is added enough mustard, cayenne and salt to make the sauce hot and appetising. After being soaked well in the sauce the legs are fried and served hot with toast.

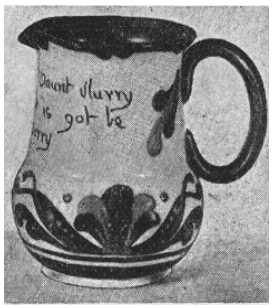
To prepare devilled game the remains of a cooked bird should be cut into neat joints, rubbed over with margarine, sprinkled with salt and cayenne, and then grilled lightly. A sauce is prepared from one tablespoonful vinegar, one shallot, one dessertspoonful each tomato sauce and margarine, a pinch of cayenne and a teacupful stock or gravy. The vinegar is brought to the boil with the cayenne and the finely chopped shallot, and the other ingredients added with the exception of the margarine. Bring the whole to the boil again, take the sauce from the ftre and stir in the margarine. The sauce is then poured round the game, which is served on rounds of toast.

Devilled Savouries. Fried and boned sardines dipped in sauce described above and served on croûtons of fried bread make a good savoury. Finely chopped ham may be used for the same purpose with a little devilled sauce.

Good after-dinner savouries are also prepared by mixing ½ oz. butter with a small pinch of cayenne pepper, ½ teaspoonful made mustard, and a teaspoonful curry paste. Spread the mixture on one side only on some dry, unsweetened, finger-shaped biscuits, dredge them well with grated cheese, and then cook them on a baking sheet in a sharp oven or under the grill. When lightly browned they are ready for serving.

DEVON WARE. The potteries in Devonshire are the outcome of the art movement which set in during the late-Victorian age. On the south coast Watcombe ware, made near Torquay, includes green and straw pieces, and barbotine designs of marine objects. Aller Vale is noted for its motto ware, brown inside and yellow outside, besides a crocus pattern, and the simple, dignified Sandringham ware.

North Devon clays are used at Barnstaple for the favourite Barum ware, which comprises simple shapes treated with bold coloured-slip designs, or with applied mouldings, such as dragons and sea creatures. A variation made at Fremington possesses an iridescent glaze of local creation This may be kad in fruit dishes, puzzle jugs and other forms. *See* Pottery.



Devon Ware: characteristic example. Aller Vale jug with motto.

DEWBERRY. A variety of bramble or blackberry is the dewberry, which grows abundantly in the woods and hedgerows of England. The fruit, large and glaucous black with a pleasant acid taste, can be used for the same purposes as blackberries. *See* Blackberry.

DEXTRINE: Its Adhesive Uses. Known also as British gum, dextrine is prepared by heating starch that has been previously moistened with dilute acids. The chief use of dextrine is in the manufacture of textiles, but it is an adhesive which finds favour with photographers for mounting purposes. A suitable mountant is made by heating 2 oz of white dextrine with 6 oz. of boiling water until it is dissolved, then allowing it to become nearly cold and stirring in an ounce of methylated spirit to act as a preservative. *See* Mounting.

DIABETES. There are two varieties of diabetes, in both of which the patient passes constantly large amounts of urine. Diabetes mellitus, generally referred to simply as diabetes, is characterized by rapid wasting and the passing of sugar in the urine in the form of glucose, and complete recovery is rare. In diabetes insipidus there is no such passing of sugar, and it is mostly children and young adults who are affected.

Men are more likely to develop diabetes mellitus than women, and it is commonest in middle life. A tendency to fatness in youth, a highly nervous disposition, a too strenuous business life, an undue fondness for the good things of the table, have all been suggested as predisposing causes of diabetes.

There is a close connexion between the health and activity of groups of cells in the pancreas or sweetbread and the symptoms of this disease. These cells secrete and pour into the blood a substance to which the name insulin has been given, and its function appears to be to ensure the burning up of sugar in the body. The injection of insulin into patients who are suffering from diabetes has been followed by the disappearance of sugar from the urine and marked improvement in the general condition.

Advice on Diet. The basis of diabetic treatment is to restrict carbohydrates (starch and sugar) in the diet, and sometimes also the proteins (lean meat, etc.), as sugar may be formed from them. What must be done in any particular case is to find out the amount of

carbohydrate which the patient can take without sugar appearing; in other words, the sugar tolerance. One method is to put the patient on a diet of meat, eggs, green vegetables, and a limited allowance of carbohydrate—say, 4 oz. of bread. It is known how much sugar is produced by this allowance, and if the sugar appearing is less, it shows that there is some tolerance. If the amount is taken without the appearance of sugar, it is gradually increased. This increase is also made possible by the daily use of insulin, the requisite number of units being injected under the skin, usually before the morning and evening meals. Insulin has proved of immense value in cases of diabetic coma, a condition of blood poisoning commonly called acidosis, which results from the perverted body chemistry.

The diet should be as varied as possible. The following may be given: Clear soup, tea and coffee (without milk or sugar), soda water, unsweetened lemon drinks, bread and biscuits made with almond, gluten or bran, cucumbers, celery (sparingly), tomatoes, asparagus (the green part), and all green vegetables, all kinds of fish and shellfish (except cod's liver), all meats (except liver), and poultry, milk (very moderately), eggs and butter, and all acid fruits, particularly oranges, currants and sour berries.

The following may not be given: Bread of all kinds, rice, tapioca, potatoes, beets, turnips, vegetable marrows, parsnips, artichokes, all malted liquors including beer, ale, stout, sweet wines and sweetened beverages. Saccharin tabloids or powder may be used in order to sweeten tea, coffee, and lemonade, etc., and may also take the place of sugar in cooked dishes.

DIACHYLON PLASTER. This is a lead plaster, used to give support and protection to the skin and superficial tissues over which it is applied and so promote healing. It may thus be used for bruises and sprains. It enters into most other plasters, e.g. resin or adhesive plaster. Mixed with an equal amount of vaseline it forms diachylon ointment, which is employed in eczema.

DIAMONDS: How to Choose. When selecting diamond jewelry, the soundest investment is to purchase good quality stones. Blue-white stones of fine quality always have a good market value, no matter what their size may be, but large stones which are not of good colour and which have flaws in them are never really good investments, no matter how advantageously they may have been acquired.

The setting of diamonds requires special consideration. The stone should be set in platinum, but on account of the high cost it is usual for the setting to be of platinum, backed with a mount, either of white or ordinary 18-carat gold. The most effective diamonds are round in shape and deep; but in higher-priced ornaments oblong-shaped or pearl-shaped brilliants are used which, if blue-white and without flaws, are extremely valuable.

Methods of Cleaning. The simplest way to keep diamonds clean is to brush them lightly with warm water with a little soap or soda added, and then to dry out the moisture from the back of the stones by means of cotton wool, which can be easily fixed on some pointed article, such as an orange stick used for manicuring. Another way is to brush the back and front of the stones with a soft brush and a little gin or whisky, after which there is no necessity to dry the stones, as the spirit is quickly absorbed.

Dianthus. Botanical name of the carnation, pink and sweet william. They are all described under those headings.

DIAPER. Little more than a name for a woven design, diaper at one time implied linen cloth with a diamond or lozenge pattern. Linen and cotton tablecloths, napkins, and towels woven in small geometrical designs, alternately bright and dull, are called diaper indiscriminately, and are made in all qualities of material.

In furniture design diaper is the repeating pattern in which the repeat is small in comparison with the space occupied. It is not applied to anything repeated on a large scale. Diaper is frequently seen in marquetry on furniture of the later part of the 18th century.

DIAPHORETICS. These are substances that are used to increase perspiration. One purpose of sweating is to lessen the temperature of the body and keep it at its normal level. If, then, we increase perspiration in fevers, we benefit the patient by reducing the fever. Another purpose of sweating is to get rid of the waste products, and when the kidneys are inactive, as in Bright's disease, increased sweating will relieve the strain on the kidneys and remove from the blood substances where retention is dangerous. The simplest means of inducing perspiration is to wrap the patient in hot blankets, giving him at the same time plain water to drink. A very hot bath, followed by half an hour in bed with plenty of bedclothes, will usually bring on profuse perspiration. Turkish or Russian baths or dry hot air baths or hot vapour baths are very efficient means of inducing perspiration.

Among the most useful diaphoretic drugs are the solution of ammonium acetate, dose 2—6 drams, and sweet spirits of nitre, dose 15-60 minims. Dover's powder, a combination of opium and ipecacuanha, is much used as a diaphoretic. At the beginning of a feverish cold an otherwise healthy adult may take 5 grains at bedtime, washing it down with a glass of hot lemonade or hot whisky and water. Within a short time profuse perspiration will set in, and care should be taken that the patient does not throw off his bedclothes and contract a fresh chill in the night. *See* Bath; Perspiration.

Diaphragm. *See* Stop.

DIARRHOEA. The commonest causes of

diarrhoea or looseness of the bowels are the ingestion of poisonous substances or unsuitable food, chill and fright or excitement. The condition may occur as a symptom in the course of some specific disease, such as cholera, typhoid or dysentery. Colicky pains, rumblings in the intestines, a coated, furred tongue, great thirst, and more or less weakness and collapse are the chief symptoms.

Where the attack has come on suddenly and unsuitable food is probably the cause, a ½ oz. or 1 oz. of castor oil, or a smaller dose in the case of children, may be given at once. If this does not produce speedy improvement, or the pain is severe, the patient should be put to bed between warm blankets with a hot-water bag or fomentations on the abdomen, and the doctor should be sent for. The diet should be milk, to which an equal amount of soda water or lime water may be added. In hot summer weather the milk should be boiled. As the attack gradually passes off arrowroot and smooth milk puddings may be added, then poached eggs, steamed fish, leading up to ordinary diet; but precautions should be taken for some time to keep out things like tough, stringy meat, fruit skins and similar indigestible substances.

Chronic diarrhoea may follow an attack of acute diarrhoea or may result from chronic indigestion, disease of the pancreas, or from chronic ulceration of the intestinal lining, as in tuberculosis. The physician should be called in, as it is only by a skilled examination that a correct diagnosis can be made.

The Complaint in Children. Diarrhoea in infancy may take the form of infantile cholera or of simple acute diarrhoea. The latter is commonest in the summer months, and is usually due to indigestion brought on by improper or excessive feeding. It may also follow chill or a sudden change in the weather. If the child is feverish from any cause, e.g. teething, diarrhoea is a common accompaniment.

In a mild case of simple acute diarrhoea, careful protection from chill or from overheating, a cutting down of the amount of milk and diluting it further, perhaps with barley water, and a teaspoonful of castor oil comprise the treatment. In all cases of chronic diarrhoea medical advice is urgently essential. The child should be kept comfortably warm and carefully protected from all chill or exposure.

Infantile cholera, a very fatal form of diarrhoea, occurring during hot weather, affects children mostly in the first two years of life, chiefly those who are hand-fed and brought up in squalid surroundings. It is due to germs in the milk which is impure or has been kept too long. A noteworthy symptom is loss of elasticity in the skin of the abdomen, and there is violent sickness and diarrhoea with a temperature rising to 102° to 104° F., and dropping perhaps to 98° with extreme prostration.

Preventive measures are of the utmost importance. At the beginning of any hot spell, more than ordinary precautions should be taken over the baby's food. Its bottles and nipples should be thoroughly scalded after each feeding, the milk should be perfectly fresh, and should be sterilized. All milk should be kept in tightly closed receptacles in a cool place, and it is better to buy half the daily quantity needed morning and evening than the whole day's supply at once. The use of a baby's comforter is highly dangerous.

The baby should be seen by the doctor as soon as possible, but in the meantime a pack may be used. A towel or piece of sheeting is wrung out of cold water and wrapped round the child from the armpits downwards. Then a blanket is wrapped round and the baby is tucked up in its cot. Till vomiting has ceased only cooled boiled water should be given; but after that albumen or whey is allowed. If signs of collapse appear, put the child in a hot bath and give it a very little weak brandy.

DIBBER. This small gardening instrument is used for planting potatoes, bulbs, green crops, etc. The most useful form is the handle of a disused spade cut down to about 12 or 15 in. The point should be shod with iron, as it keeps cleaner, works easier and lasts longer If not shod, the point should be charred with fire and then rubbed down with sandpaper. A foot-driven dibber is sometimes used for planting potatoes, but it is not recommended by the best authorities. *See* Cabbage; Chrysanthemum; Daffodil.

DICE. Dice are used in several games of chance, for instance, backgammon; also in the class of games known as race games. They are small pieces of ivory or wood, each having six equal sides. On each side are dots, or pips, 1, 2, 3, 4, 5 and 6 in number respectively, these being arranged so that those on opposite sides shall together total 7. Thus 3 is opposite 4 and 1 is opposite 6.

The dice, generally two but sometimes more in number, are thrown by the players in turn, either from the hand or from a dice box, and the player receives the numbers that are uppermost as the dice lie on the table. Dice can be made by cutting pieces of wood into the necessary shape and marking them with ink to make the dots. Great care should be taken that the pieces are cut quite evenly; otherwise the dice will be unreliable and should not be used. *See* Backgammon.

DIE. The word die is applied to various tools. The die used to stamp an address upon notepaper is known as an embossing die, being engraved with the letters to be embossed on the paper. It is fixed in a cast-iron frame, having a hand lever at the upper part which when depressed forces the die down on to the paper. The paper is placed upon a counterpart having corresponding letters raised on its surface. Dies for cutting screw threads are dealt with in the article Stocks and Dies. *See* Screw Plate.

DIELECTRIC. This is the non-conductor or insulating substance which separates the plates of a condenser. The actual capacity of a condenser depends

upon the nature of the dielectric, i.e upon the dielectric constant, which for air is one, while for mica it may vary from 4 to 8 (according to the type of mica used).

Thus the capacity of a condenser having a mica dielectric might be as much as eight times that of a similar condenser employing air as the dielectric. *See* Capacity; Condenser.

DIET: ITS SCIENTIFIC PRINCIPLES

Cardinal Rules Governing the Nutrition of the Body

The correct balance of the constituents of a dietary is discussed here. Particular aspects of the subject are treated under such headings as Egg; Milk; while information on special diets required in disease will be found in the articles Consumption; Diabetes; etc. See also Digestion; Eating; Food.

The essentials of a proper diet are that it should provide for growth and for the replacement of waste, that it should furnish the heat and energy required by the body, and that it should furnish also a measure of stimulation to metabolism and to the functions of the alimentary tract. An analysis of foodstuffs shows that they are made up of certain constituents, namely, proteins or nitrogenous substances, carbohydrates, fats, salts, vitamins and water.

The proteins, of which white of egg and lean meat are examples, are the tissue-builders and make good the loss of tissue due to the wear and tear of living; they also go to the making of the secretions of the body. A growing person requires a liberal allowance of proteins. These substances are contained in flesh, fish and fowl and also in wheat and other vegetable foods, but those of animal origin have in addition a certain dynamic quality which explains the craving for animal food in cold climates, and the lessened inclination for it among dwellers in temperate climes during the hotter weather. Proteins also furnish a certain amount of heat and energy, but the proper sources of most of our requirements of these are carbohydrates and fats.

Calorie the Unit of Energy

The amount of heat, and incidentally of energy, as heat and energy are convertible into one another, furnished to the body by fixed amounts of protein, fat and carbohydrate can be estimated by burning them outside the body. The amount of heat is calculated according to a unit known as a calorie, or, as is usual when dealing with foodstuffs, a large, or kilogramme, calorie.

A calorie, or small calorie, is the quantity of heat required to raise the temperature of 1 gramme of water through 1° C.; a large calorie, that required to raise the temperature of 1 kilogramme, or 1 litre, of water also through 1° C. In what follows, when the term calorie is used it is the large calorie that is meant.

It has been found then that 1 gramme of either protein or carbohydrate produces 4 calories, while the same amount of fat produces 9 calories. The excellence of fat as a source of heat is apparent, and, for a reason to be mentioned hereafter when treating of vitamins, fat is an essential part of any diet. It might appear then, that fat might be used altogether in place of carbohydrate, but this is not so; the body cannot burn up fat properly unless in the presence of a relatively large amount of carbohydrate. Otherwise poisonous substances accumulate in the blood. The optimum balance differs, however, with circumstances. In cold climates and in cold weather an increase of fat is indicated.

From experiments it has been found that the number of calories expended and required in the 24 hours by various classes of persons are as follows:

Man doing hard muscular work	4,000 calories
Man doing moderate muscular work	3,500 „
Man doing light muscular work	3,000 „
Man doing sedentary work	2,500 „
Average woman	2,500 „
Man in bed, feeding	1,850 „
Man in bed, fasting	1,700 „

Different opinions have been expressed regarding the relative proportions of the three food constituents which should be represented in the diet. Two scales which have been suggested as suitable for a man doing light muscular work, that is, requiring 3,000 calories, are as follows:

Protein	Carbohydrate	Fat	Actual Calorie value
120 grammes	500 grammes	50 grammes	3,007
100 „	350 „	100 „	3,090

The salts in foodstuffs include those of iron, calcium, magnesium, sodium and potassium, and are necessary in tissue building or, in various ways, in the chemical processes which go on in the body.

Even should a diet be corrected, however, in all the particulars mentioned up to this point, it will not be a good diet, unless the foods included contain certain substances known as accessory food factors or vitamins. Several of these vitamins have been recognized, namely, three which are soluble in fat, but not in water, and known respectively as A, D and E, and three which are soluble in water and known as B, B2 and C.

Fat soluble A prevents xerophthalmia, D prevents rickets, and E has been shown to be necessary to reproduction in rats fed on an artificial diet in which A and D were present; the absence of water-soluble B leads to beriberi, and it is therefore also known as the anti-neuritic vitamin; B2 prevents pellagra; while the absence of water-soluble C leads to scurvy and it is therefore called the anti-scorbutic vitamin. It is probable that ill-defined diseases occurring in those who feed on artificial foods is explained by vitamin starvation.

In the following table the vitamin content of various foods is set out:

Foodstuff	Fat Soluble A	Water Soluble B	Water Soluble C
Milk	+ +	−	+
Butter	+ + +	−	−
Cream	+ +	−	+?
Egg yolk	+ +	+ +	−
Beef fat	+	−	−
Mutton fat	+	−	−
Lard	−	−	−
Pork	−	−	−
White fish	−	−	−
Herring	−	−	−
Cod-liver oil	+ + +	−	−
Margarine (containing animal fat)	+	−	−
Vegetable oils	−	−	−
Wheat (whole grain)	+	+ +	−
White flour	−	−	−
Polished rice	−	−	−
Fresh fruit (especially orange, lemon, grape fruit, tomato)	−	−	+ + +
Nuts	−	+ + +	−
Green vegetables (raw)	+ +	−	+ + +
Green vegetables (cooked for a short time	+ +	−	+
Potato	−	+	+
Swede turnip	−	+	+ +
Yeast	−	+ + +	−

+ + += abundant supply; + + = moderate supply; + = fair supply; - = none.

Foods which contain vitamin A generally contain D also, and the statements in the first column above, regarding the presence and richness of vitamin A, may be taken as applying equally to vitamin D. There is very little vitamin D in green vegetables, however, and conversely the body fat of fish contains no vitamin A but a fair proportion of vitamin D, so that herrings, for example, may be used as a source of the latter. What is said about vitamin B above applies more or less to vitamin B2, but milk, which does not contain the former contains the latter, and this also occurs in lean meat, fish, cheese and eggs.

Other characteristics of a good diet remain to be considered. It must excite the digestive functions and must contain a sufficient amount of indigestible material, or, as it is called, roughage, to stimulate the muscular movements of the gut and so promote regularity in the action of the bowels.

Appetite and digestion are improved by variety in the diet and by good cooking. Foods which require chewing are helpful because they allow time for the action of saliva, and the act of chewing stimulates the flow of gastric juice. Moreover, it should be recognized that chewing crisp food, such as an apple, is a natural method of cleansing the teeth. Roughage is supplied chiefly by the cellulose contained in vegetables and fruits.

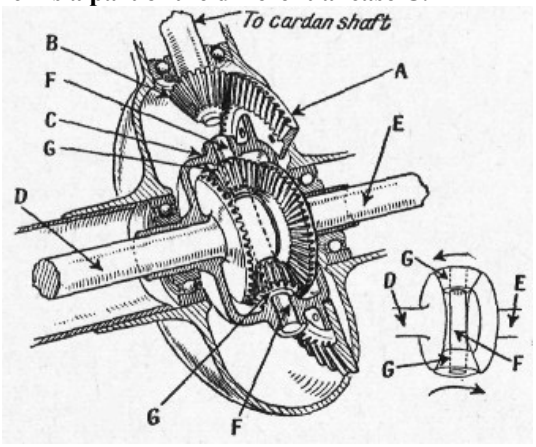
An excessive diet strains the digestive and excretory apparatus of the body, leading to indigestion and auto-intoxication. Some of the excess is laid down as fat, and a flabby obesity is also the common result of an excessive consumption of carbohydrates, another result being flatulent indigestion. In some diseases adjustment of the diet is the most important part of the treatment.

After a person has passed middle age his dietary should be reviewed frequently and the quantity should diminish pari-passu with his output of work as the years go on. For old age food must be simple and easily digested and as the body heat is less easily maintained, it should contain an adequate amount of fats and carbohydrates.

DIFFERENTIAL GEAR. The differential, or balance, gear as now used in a motor car is always incorporated in the live axle. The differential is employed so that the relative movement of the back wheels (or front wheels in the case of front-wheel drive) shall be capable of self-adjustment to the needs of the moment. When the vehicle is turning a corner the wheel on the inside of the curve is travelling slower than the outside wheel.

Two Designs of the Gear. There are two designs of differential gears employed, viz. the bevel and spur pinion types. The better-known and more easily understood is the bevel. First of all it has to be remembered that the road wheels control the differential.

In the diagram, A is the crown wheel driven by the bevel pinion B. The crown wheel A is mounted solid with the differential case C, which rotates on the same centres, but independently of the axle-shafts D and E. The differential case C carries the bearing pin F, on which the two small bevel pinions G are mounted. These pinions are capable of independent rotation, but are both in mesh with the large bevel pinions mounted solid on the axle shafts D and E. Therefore, so long as the axle shafts D and E are rotating at an equal speed (owing to the car travelling in a straight line) there will be no movement of the pinions G, the whole rotating as though solid through the medium of the crown wheel A, which is a part of the differential case C.



Differential Gear. Diagram showing tbe working of the bevel gear type.

Now, assume that the car is travelling to the right of the page and so is turning to the right. During this

movement of the car the road wheel that is a part of the axle shaft D will have to make a greater number of revolutions, as it is on the outside of the curve, than the road wheel that is a part of the axle shaft E, and is on the inside of the curve. To allow of this movement, it will be obvious that the two small bevels G will be turned through the medium of the large bevel pinion, on the axle shaft D, in the direction of the two curved arrows shown in the small diagram, thereby allowing the relative differences of speed between the two axle shafts D and E to take place.

The two small bevel pinions G are in reality a compensating coupling between the axle shafts D and E, their movement being governed solely by the variations of speed between the two road wheels. In all other respects they act as the driving medium to the axle shafts so long as the road wheels are in contact with the ground.

If, however, one of the wheels should be lifted free of the ground, and the crown wheel A rotated, then the small pinions G will be free to rotate, and by so doing will reverse the direction of rotation of the wheel that is lifted free, the other wheel remaining stationary. On high-powered vehicles three or four of the small pinions G are employed. *See* Gear; Motor Car.

DIGESTER: Use in Cooking. Strong iron boilers used for making soups, etc., are known as digesters. They have lids which screw down tightly so as to confine all the steam, and by this means the water may be heated several degrees higher than boiling point. So that the vessel will not burst, the lid is fitted with a safety valve by which the heat of the steam can be regulated. Meat cooked in these boilers may be entirely dissolved and bones reduced to jelly.

A special type of digester allows the steam to escape through the valve on the lid, and for this reason should be only three parts filled with water. When cooking begins, it should be placed near a slow fire and its contents allowed to simmer for 8-10 hours. The soup should then be strained through a hair sieve or colander, put back into the digester, vegetables and seasoning added, and the whole boiled for 1-2 hours. Digesters of this kind vary in capacity from 4 quarts to 10 gallons. Saucepan and stewpan digesters made on the same principles hold from 1-8 quarts. To clean digesters, wash them in hot water to which a little soda has been added, and then scrub them inside and out. Finally rinse them and dry them with a clean cloth. The digester has been largely superseded by the casserole, at least as far as stews are concerned. *See* Casserole; Soup; Stockpot.

DIGESTION: Its Functions. The food that we eat would fail of its purpose were it not altered into products suitable for the nourishment of every part of our bodies. These products are carried in the blood and must, therefore, be soluble. The process of alteration is known as digestion. The changes involved are many and complicated, but all are supervised, without conscious effort, by the nervous system, which has filaments at every point of the canal, 30 ft. long, traversed by the food.

In the mouth, digestion of starchy foods is begun by the saliva, while movements of cheek and tongue aid the teeth in crushing the food into a soft rounded mass or bolus. Swallowing is begun by the tongue pushing back the bolus into the grasp of the muscles surrounding the throat. These pass it quickly over the air passage, which is protected by a small flap called the epiglottis. The muscles of the oesophagus next push the food into the stomach.

The stomach is a sensitive muscular tube changing frequently in shape and position. Its lining produces gastric juice, which renders the food acid and digests to a large extent the meaty portion of the diet. The formation of gastric juices is increased when one sees food and when chewing takes place, as well as at the time of its arrival in the stomach. Hence the importance of food being cooked in an appetizing way and attractively served.

An ordinary meal remains for some four hours in the stomach and is then pressed out, in a liquid state, into the upper end of the small intestine, or duodenum. A short distance down, a duct brings to it the secretions of the liver and pancreas. The fluid formed by the liver is called bile, and this is an important agent in digesting fatty foods. The pancreatic juice acts on starchy or farinaceous substances and also causes further disintegration of meat products.

The 1ong coils of the small intestine lie in many loops packed in the central part of the abdomen, and the absorption of feeding-stuffs mainly occurs while the food is being propelled by regular waves of contraction, called peristalsis, along the seven yards of these coils.

In addition to the digestive juices mentioned above, there is a secretion from multitudinous small glands which dot the lining membrane of this tube. This secretion aids digestion and makes the food alkaline. The lining membrane is also corrugated into transverse ridges, so that an extensive surface is presented to the digesting food and its rate of flow delayed. All over the surface occur minute projections which have inside them a network of bloodvessels and lacteals. These villi, being bathed in digested food, suck out from it the nourishment which serves to renovate all parts of the body. The special function of the lacteal vessels is to collect the digested fats. These are carried into the thoracic duct, which discharges them into the great veins near the heart.

The contents of the small intestine pass into the large intestine, at the commencement of which is situated the vermiform appendix. This is the worm-like blind pouch so well known as the site of appendicitis. The large intestine is provided with many mucous glands, and single lymphoid glands which probably serve to drain off deleterious substances. It measures about 2 yards in length and terminates in the rectum, where the undigested remnants of food and the remains of digesting fluids collect until voided. Regularity in passing the excretions should be taught in infancy. If

such errors as insufficient exercise, undue restriction of drinking water and the use of tight clothing are avoided, the habit will remain regular provided the diet is reasonable in quantity and quality. *S e e* Diet; Indigestion.

DIGESTIVE. A substance which reinforces the digestive juices of the body, and therefore is useful in dyspepsia and digestive weakness generally, is termed a digestive. The digestive may be given inwardly to be of assistance in the process going on in the alimentary tract, or, as in the peptonizing of milk, etc., it is added to the food and allowed to act for a certain time before this is taken.

Some digest the proteins, like lean meat and white of egg, e.g. pepsin. This ferment, dose 5 to 10 grains, may be given in powder, pill, cachet, or tablet, or in liquid form as the glycerin of pepsin, dose 1 to 2 drams, and in this case is usually combined with a little dilute hydrochloric acid. Pancreatic solution, dose 1 to 2 drams, contains trypsin, which is a protein digestant, and also a ferment which digests starch.

Benger's food contains wheaten flour, with the addition of the digestive ferments of pancreatic juice, which convert its contained starch into sugar, while the milk used in the preparation of the food is partially peptonized. The food as prepared can be graded to the patient's digestive powers by allowing a longer or shorter time for the action of the ferments, before finally stopping this by bringing the food to the boil.

Among other digestives of starch, mention may be made of taka-diastase, obtainable in capsules, dose 1 to 5 grains, and extract of malt, dose 1 to 4 drams. The latter may be useful in dyspepsia in children in a dose of a teaspoonful thrice daily.

DIGGING. The successful management of plants depends chiefly on deep cultivation of the soil by digging and trenching. Trenching cultivates the soil three spits (a spit is the depth of soil removed by the spade when thrust straight down); double digging cultivates it two spits, and in ordinary digging the surface only is turned over.

The way to dig a piece of cultivated ground is to take out a trench 2 ft. deep across one end of the plot and to place the soil at the opposite end of the plot. The bottom of the trench is forked over and garden refuse or strawy manure is mixed in. The top layer of the next 2 ft. strip of ground is then placed in the bottom of the first trench and stable or farmyard manure, if available, is forked into it. The second layer of soil is placed on top of it, thus filling the first and opening the second trench. And so the work is continued until the end of the plot is reached, when the soil excavated from the first trench is used to fill the last one. This method of cultivation is sufficient for general purposes; those who grow produce for exhibition sometimes trench the ground three spits deep; manure is placed in the second spit of soil and rough garden refuse, or coarse manure, in the bottom of the trench.

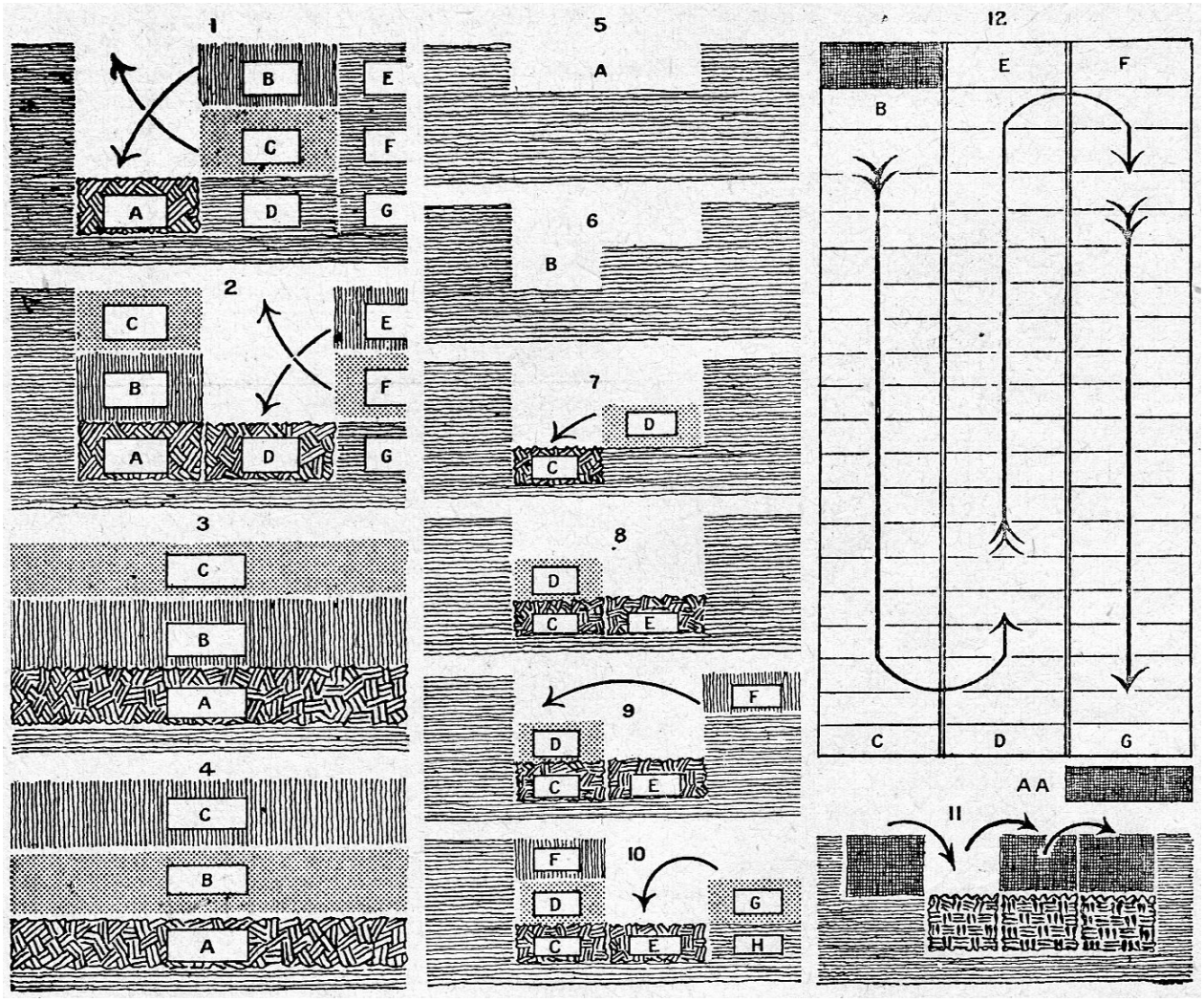
A different practice is followed when dealing with fresh land—that is land which has not been previously cultivated as a garden. If it is covered with turf this should be stripped off about 3 in. deep and stacked for a year. It may then be dug into the ground. A 2 ft. wide trench is dug across one end of the plot and the soil taken out is placed at the end as already described. But the next detail is different, because it is essential that the top soil and subsoil be kept in the same respective positions.

This is assured by taking off the top spit from the second 2 ft. strip of ground and placing it also at the opposite end of the plot. Thus the first trench is empty and the second trench is half empty. The subsoil from the second trench is then placed in the bottom of the first trench and the top soil from the next strip of ground is put on it. Thus the first trench is full, the second is empty, and the third is half empty. The method keeps the subsoil and the top soil in the same positions as they were before. In subsequent years their positions may be reversed by adopting the ordinary method of trenching as already described.

The Diagrams Explained. The accompanying diagrams picture three methods of digging. Figs. 1 to 4 cover what is known as double digging, which, although entailing much hard work, ensures perfect preparation of the soil. Commence by taking out a trench two spits deep and carry the soil to the spot where digging will end. Break up the subsoil A, transfer the top soil B on to this, and then lift the second spit C on top. Fig. 2 shows the resulting position. Now break up the subsoil at the bottom of the new trench, dig down the top soil E to second place, and again transfer the second spit to the surface. Continue the operation in this order until the whole plot is completely dug.

The position at the end of the first digging is shown in Fig. 3; the subsoil A is broken and loosened, the good top soil has taken the place of the original second spit, while the whole of the second spit has been brought to the surface for weathering. This first digging is done during the autumn. In spring the second digging is carried out in precisely the same manner, which restores the freshened underspit to its original position and brings the old top spit to the surface again. The soil taken from the first trench is used to fill the vacant trench left at the end.

Figs. 5 to 10 show a single digging method which will be found highly satisfactory when time cannot be devoted to double digging. Take out a trench one spit deep, as in Fig. 5, follow with another half the width (Fig. 6), and conclude by breaking up the bottom spit, as in Fig. 7. Dig over the second spit D, as in Fig. 8, and then loosen the bottom spit E. Now lift the top soil F on to D (Fig. 9), which refills and completes the first trench (Fig. 10.) The operation is continued in the same manner —that is to say, the next portion of undug second spit is put above the broken bottom spit, the next top spit carried to the surface, and so on. Fill the last hole with the soil taken from the original trench.



Digging. Figs. 1-12. Diagrams illustrating effective ways of digging a kitchen garden. Figs. 1-4. Double digging. Figs. 5-10. Single digging. Fig. 11. Emergency digging. 12. How to dig a large plot.

Another method, easier still, is shown in Fig. 11. Simply take out a trench one spit deep and break up and manure the soil beneath. Dig the next top spit on to this, continuing as directed by the arrows in the sketch.

An excellent way to dig a large surface methodically and regularly is to divide the plot into three sections, as pictured in Fig 12. Commence by taking out a trench at A, and deposit the soil at A A. Step backwards and transfer B into trench A, and work down to C, as directed by the arrows. An empty trench will consequently result at C, and into this dig the soil from D. Then face the open trench at D, and continue until you have an open trench at F. Now face this trench, and dig on in the same order until the end of the plot is reached. An open trench, of course, results at G, and into this place the soil A A from the original trench. *See* Garden; Spade.

DIGITALIS. This powerful and useful drug is obtained from the foxglove. Its chief action is to slow the beat of the heart and to increase blood pressure. It is often used when the blood pressure is low, and is of value in cases of heart disease and dropsy. But when taken over a period it may accumulate in the body and lead to poisoning. The first symptoms are palpitation and unevenness of the heart beat. In severe cases the patient turns livid, with shortness of breath, and should be put to bed at once, avoiding all exertion until the doctor arrives. Strong hot tea, diluted spirits, or sal volatile should be given. When poisoning is due to an overdose, an emetic must be given to start with, and vomiting encouraged by draughts of tepid water. See Foxglove; Heart. Pron. Dij'i-tã-lis.

DILAPIDATIONS. This is a subject of increased importance to the householder owing to the high cost of labour and the consequent necessity of doing his own renovating wherever possible.

In purchasing a house, due regard should be paid to those parts which are likely to prove vulnerable from the standpoint of dilapidations. Externally, these may be summed up as the brickwork and the roof. Re-pointing brickwork that has perhaps become unsound enough to be no longer weatherproof, owing to percolation of the mortar, the bricks themselves, or both, is an expensive business, and can hardly be tackled by anybody not possessing practical knowledge of building; nor is the replacing of slates or tiles any less an expert's job.

Internally, however, there are certain dilapidations which can be put right without much trouble. Papering and painting are among them. Other dilapidations likely to call for attention more frequently than the walls or woodwork are those of door handles, electric or other bells, the stained parts of floors, the catches of windows, painted metal baths, etc. These are comparatively small matters which can be dealt with as occasion demands. The major dilapidations involving papering and painting lose much of their formidableness if they are taken in hand gradually and systematically. *See* Building; Cottage; Lease; Repairs.

DILL. Aromatic herb with finely divided foliage resembling fennel, but of much smaller growth. It may be raised from seed sown in spring, the plants being thinned to about 1 ft. apart. The leaves are used for flavouring soups and sauces, and the seed for distilling oil of dill and for making the carminative known as dill water.

Dill Water. For infants and children a useful carminative is found in dill water, which is prepared from the dried seed of the plant. The dose is 1 to 2 fluid oz.; for children, a teaspoonful. For flatulence and hiccough an infant may be given half a teaspoonful with a little pinch of bicarbonate of soda added.

DIMORPHOTHECA (Namaqualand daisy or star of the veldt). This is a beautiful hardy annual bearing daisy-like flowers in orange, yellow, salmon, apricot, and blush. The seeds are sown out of doors in April where the plants are to bloom in summer; they like a sunny position and well drained soil. Star of the veldt also makes a good pot plant for the greenhouse. Seeds are sown thinly in 5 inch pots of soil and the seedlings are thinned out, not transplanted.

THE DINING ROOM AND ITS FURNISHING

Practical Suggestions for Small and Large Houses

The entries on the various pieces of furniture should be consulted, e.g. Chair; Sideboard; Table. See also Alcove; Carpet; Colour; Cupboard; Curtain; Decoration, etc.; while attention is drawn to the article Dinner.

In recently-built houses the position of the dining room is generally decided with due regard to aspect. Under other circumstances, where choice is possible, a window facing east is a desirable feature in the room selected as a dining room, in order to get the advantage of any sunshine at breakfast time.

The ideal arrangement in a detached house is a corner room with a window facing south and another east, especially if possessing French casements opening on to a veranda or loggia so that the dining room may be practically extended in the summer by meals being taken outside. A useful piece of furniture for this is a three-tiered service trolley, obtainable with a locking device, which when released allows the three tiers to swing into a level position, forming a table at which several people can be seated comfortably for a meal, the trolley being loaded with requirements and easily wheeled from the kitchen, thus facilitating service.

Aids to Service. The most practical consideration in connexion with the dining room is service with the kitchen. In the small house, where the room is next to the kitchen and one maid is kept, a service hatch saves many footsteps in the day. It may be arranged, as shown in the third illustration, with a china cupboard to balance it on the other side of the oak Welsh dresser. In this case the hatch in itself forms a useful place for storing china and glass. On the lower shelf on the dining room side glass is kept, while china is stored on the glazed upper portion on the kitchen side.

A service feature in some of the smaller modern dining rooms is a built-in sideboard with a hatch forming its upper part which on the kitchen side, is part of the dresser. When the cutlery and china have been washed up they are placed on shelves accessible from the dining room side so that they are ready for laying the next meal. Sometimes the service hatch looks like a small wall cupboard which, when opened in the dining room, reveals circular trays, revolved when necessary on a central pivot.

For dining rooms which are not on the same floor as the kitchen, a small service lift either worked by electricity or hand-power with pulley ropes, is the only method of obviating the necessity of loaded trays. Such

lifts can be installed without much difficulty if the dining room is directly above the kitchen and there are no restrictions to preclude it. For the long corridor in a flat or house between kitchen and dining room the tiered service wagon is practically a necessity.

In the larger type of dining room, a good arrangement is for a hatch to open into a small pantry, which amounts to a cut-off lobby separating the kitchen from the dining room. Such a pantry should be well ventilated, and fitted with shelves and a sink.

Attractive Schemes. Styles in decoration and furnishing for dining rooms are so many that choice is almost bewildering when confronted with this problem in a fresh home. The type of house, size of room and question of expense will all be decisive factors. If a house has been fairly recently designed it will probably be equipped with a built-in sideboard. Should cupboards and a window seat also have been added, the flooring be laid parquet and the walls panelled, the furnishing question merely resolves itself into suitable table and chairs, with well designed carpet and curtains. In such a room beautiful effects are simply obtained by the use of browns and shades of cream to orange. The frieze and ceiling could be distempered a creamy apricot. Dinner services should always be chosen with regard to the decorative scheme of the dining room.

When dining rooms are not panelled a tinted plaster or other roughly textured effect is often used for the walls. A room in Spanish style is shown in Fig. 1. The nail-studded leather upholstered chairs, wrought iron sconces, and table setting stress the Spanish note. A dining room inspired by this scheme could have tiles in black and grey marble rubber flooring, salmon pink tinted plaster walls and curtains in velvet of a dark olive green.



Dining Room. Fig. 1. Room in Spanish style, this note being struck in the tiled floor, distinctive table equipment, nail-studded leather chairs and wrought iron sconces.

Extreme styles in furnishing include a dining table with a heavy pedestal instead of legs, and chairs with steel tubes instead of woodwork and cane upholstery. More universally admired are charming rooms with a suggestion of period setting like that seen in Fig. 2, with its simple yet formal Empire style. The ropes and huge tassel instead of a pelmet are a happy thought, as they exclude no light, while the treatment of the chimney piece is in perfect taste.

Such a furnishing would be suitable for a smaller dining room in a flat and would be one of which the inmates would not tire. The colour of the wall paper could be in two shades of grey, a black note for the medallions and plaques, the paintwork in the deeper grey scumbled over a silver powder undercoat and finished with eggshell gloss varnish. The line of moulding between ceiling and walls would be in black, which would be repeated for the cords and tassels, while the curtains brighten the colour scheme with deep coral pink, a paler shade being used to distemper the ceiling.

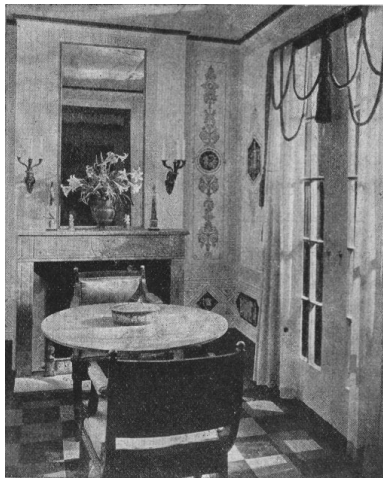
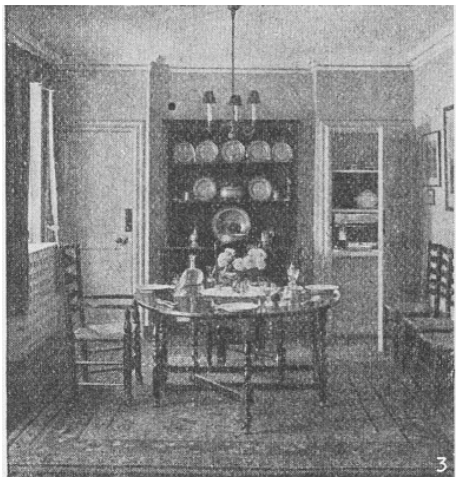


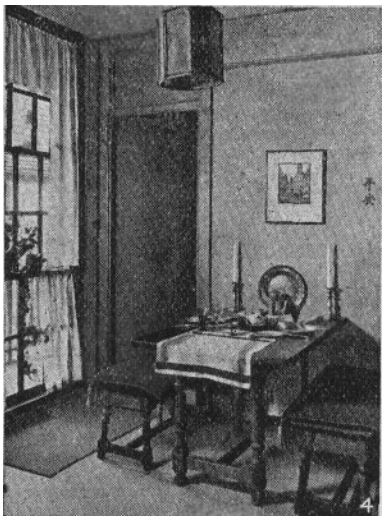
Fig. 2. Small dining room in Empire style. The prevailing tones in this room are shades of grey, deep coral pink and black, with furniture in accord with the period.

Fig. 3 also shows a scheme of furnishing suitable for a small room, but of less formal type with its gate-legged oak table, Welsh dresser and rush-seated chairs. An oak chest and brick fireplace would complete the scheme, which would be pleasant carried out in a golden amber shade of water paint for the walls, with a paler shade for ceiling, a Wilton carpet in Persian design and curtains of shot fabric suitably blending the colours of the carpet.



Dining Room. Fig. 3. Design for a small room with light walls and oak furniture. There is a china cupboard and service hatch on either side of the dresser. (*Courtesy of Our Homes & Gardens)*

In Fig. 4 is illustrated a good arrangement for the tiny bungalow dining room, or a hall dining room, sometimes met with in a small flat. The simple oak stools are enriched with maroon coloured velvet cushions, having gold tassels at the corners; the golden note could be picked up in the brass candlesticks and the lantern-shaped lighting fitting. The walls of the room and ceiling could be distempered a pinkish stone room and ceiling could be distempered a pinkish stone with frieze moulding of light brown to match the weathered oak colour of door and furniture. The



carpet would be of natural haircord. carpet would be of natural haircord. For the winter there would be curtains of maroon velours.

Fig. 4. Charming arrangement where space is limited.

DINING TABLES, PRACTICAL AND PLEASING With Details about the Construction of Expanding Tables

Further articles in this work deal with other types of table, e.g. Bed Table; Console Table; Table; Writing Table. See too Billiard Table; Sideboard. The craftsman should consult the entries Amateur Carpentry; Cabinet Making; Joint, etc.

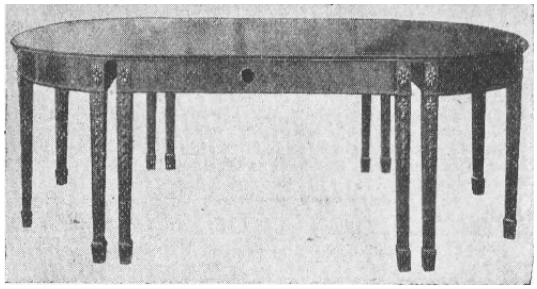
The first dining table was just an ordinary table put to this use, square and solid, and quite plain. Dining tables soon became more elaborate articles of furniture, made to harmonize with the other pieces in the room. They were of oak, mahogany, cedar or chestnut, but the cheaper woods soon came into use.

At the end of the 18th century the dining table was, as a rule, extremely well made. The usual type in the best houses was one supported upon pillars and claws, four claws to each pillar, and running upon brass castors. By this time the idea of the expanding table had been evolved, and patents for this were taken out before 1800. Then came the expanding table worked by means of a long screw. By turning this the table can be opened out and loose leaves inserted therein, thus, if necessary, doubling the length of the original table. In the 19th century a circular or oval expanding table was introduced into the English dining room.



Circular table in Chippendale style with claw and ball feet (Courtesy of W. Whiteley, Ltd.)

Making a Table. Of all the various types of extending tables, the draw table (Fig. 1) is still in many respects the best. It is simple in action, durable and absolutely rigid, and has passed the test of time, as is amply proved by the inspection of the old 16th century draw tables. Their only disadvantage compared with the telescopic type is that whereas the latter can be extended to over four times its normal length, the draw type will only open to nearly double the length. However, this is ample for ordinary purposes.



Dining Table. Extending table made in the Adam style.

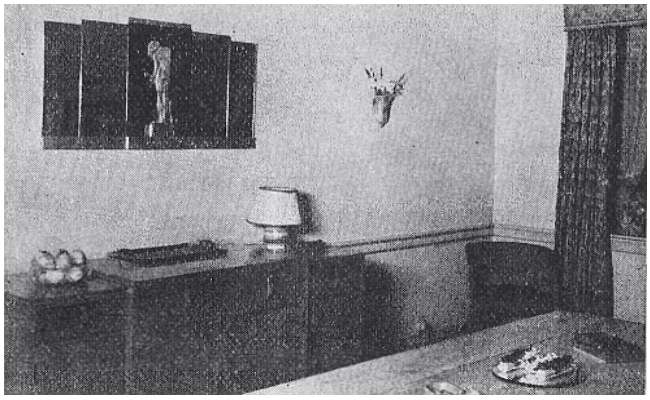
Differing from other types, the legs and underframing remain stationary, while the leaves or extentions are contained under the main top and are pulled out at each end when required, being supported by bearers tapering towards their extremities. These bearers are screwed to the extensions and fit into notches cut in the end rails of the table. When pulled out the effect is to raise the extensions up to the height of the main top, which is loose, forming a flush join. The top, however, cannot be lifted off or moved sideways, as it is kept in position by guides. To close the table, the main top is lifted to allow the extensions to pass underneath.

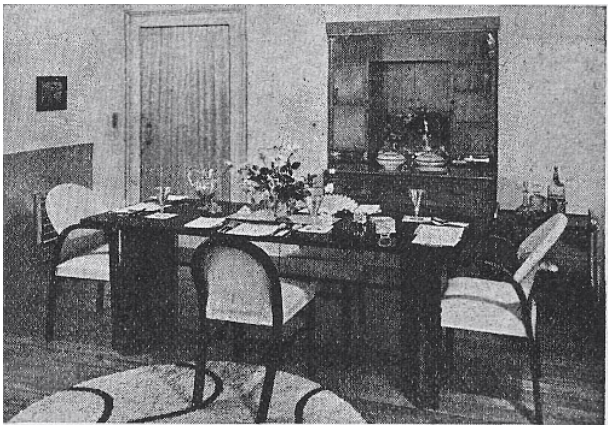
Success lies in the correct making of the bearers, and it is advisable to set these out full size before commencing the job. The legs are cut from 4 in. squares and are mortised to take the rails, the tenons of which should be as long as possible to obtain the maximum strength. They are also pinned. Note that at one end the notches for the bearers occur immediately against the legs, so that the width of the tenon will only be from the bottom of the notch to the bottom of the rail (Fig. 3). A grooved moulding is worked on the rails, though this may be omitted if desired; the same applies to the lower rails or stretchers. Having turned the legs, the table may be glued together; the underframing does not differ from that of an ordinary table except that allowance is made in the height for the thickness of two tops.

Below the main top and between the two extensions is now fixed a centre cross piece (Fig. 2). This measures in length just the width of the top; it is 1 ft. wide, and the same thickness as the top. Two slots are cut, as in Fig. 4, to take the two top guides; the cross piece is screwed to the rails. The top and two extensions are now made as in Figs. 5 and 6. The 1 in. framing is mitred and tongued at the corners, with two centre cross rails tenoned between and having ¾ in. panels tongued and grooved between them; panels are not glued.

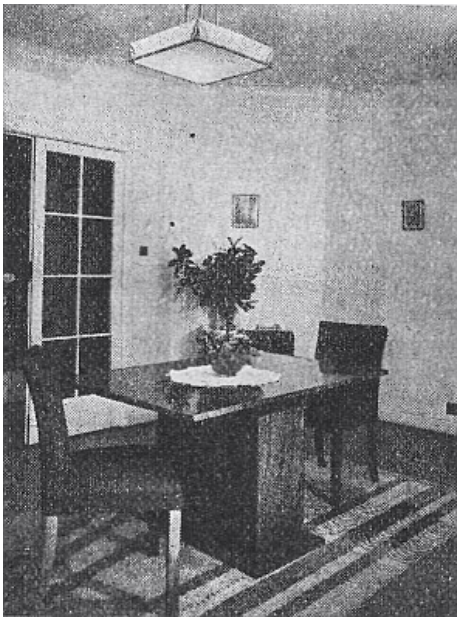
When the framing is glued together, the whole should be trued up and thicknessed, making sure that it is perfectly straight and flat and out of winding. Two

(Continued in page 652)



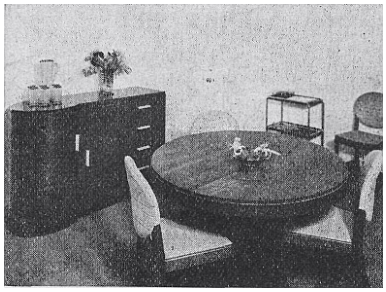


Left: sideboard and table in scrubbed oak; the mirror is built up of four pieces of vitrolite, cast-metal figure in centre. Right: cellulosed chairs covered in ivory or crimson hide, with vitrolite-topped table. Note illuminated opaque glass cupboards.



DINING ROOM: FURNISHING DESIGN AND EQUIPMENT

New Styles and Old in Modern Houses and Flats

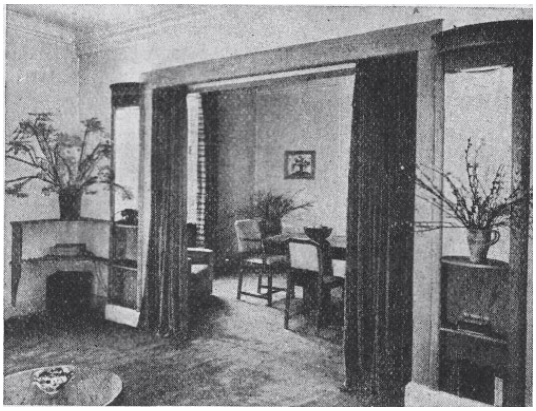




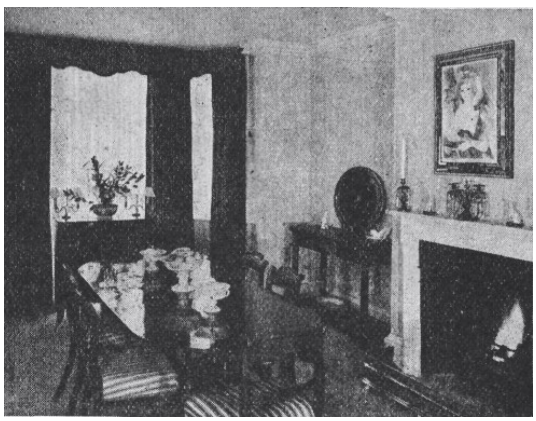
For a modern flat: waxed walnut table with a cupboard underneath and folding top. The chairs are covered in repp, the spotted design contrasting with the general impression of squareness.

A small round table offers plenty of leg room. Observe also the modern sideboard of Nigerian cherry mahogany with white bone handles, in which the curve of the table is repeated.

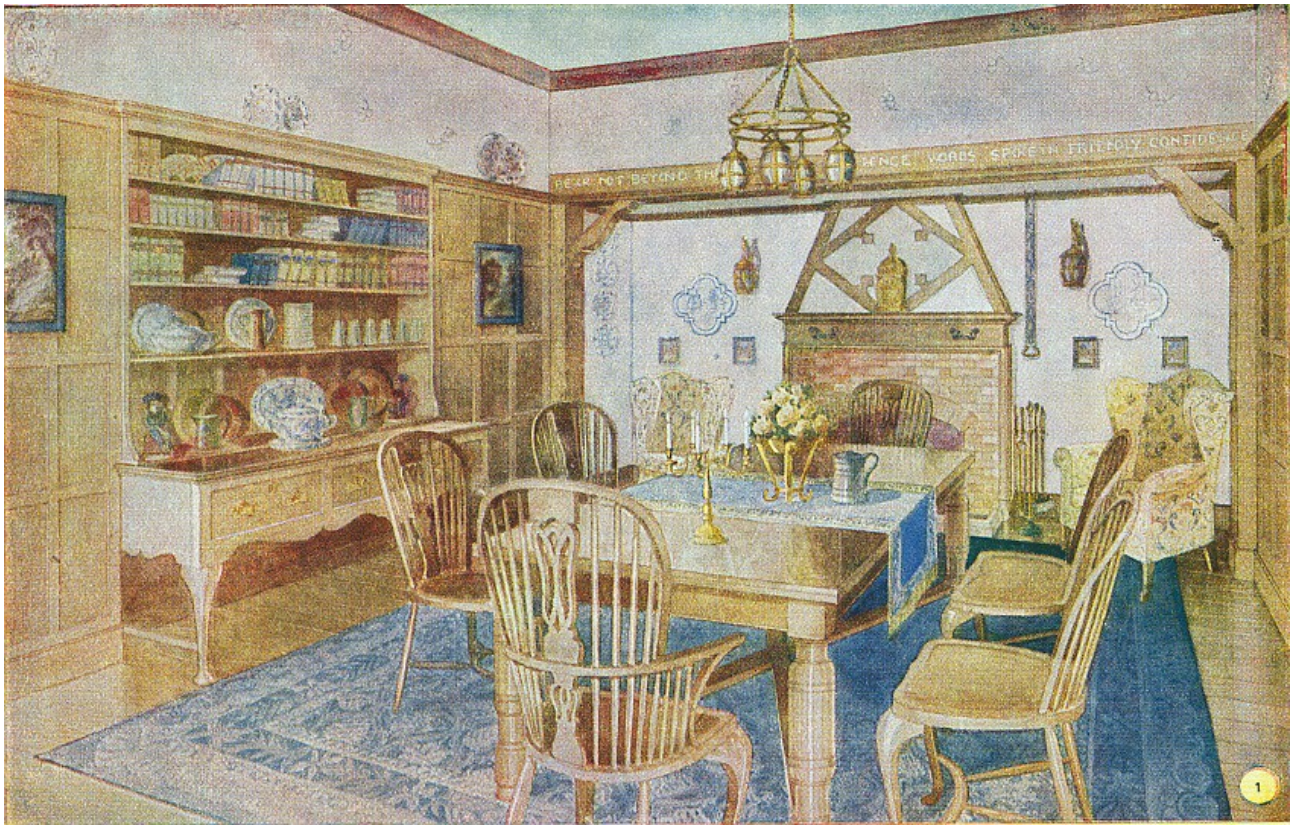
Here is shown the fashion for butting the dining-table against the wall to save space. Note Viennese vogue of strip-lighted wallbrackets for flowers, also heavy-cretonned chairs.

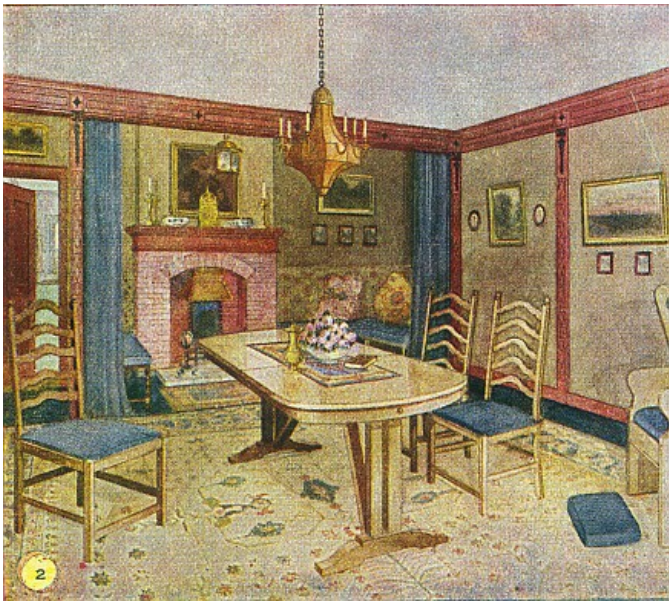


Two dining rooms from Chelsea flats, one of restrained modernity, the other a period piece. Left: view from living room set apart by velvet curtains. Notice the natural oak surround to the division, also attractive arrangement of shelves. The whole dispenses with an ugly partition.



Right: lavender grey and white walls in a Regency room, with rich red damask curtains and red and white damask Regency chairs. (Photos: Margaret Currant. Humphrey ana Vera Joel, and Lincoln Collins)







DINING ROOM: HARMONIOUS COLOUR SCHEMES FOR MODERATE INCOMES

In illustration No. 1 is shown a dining room of which the predominating tones are blue and brown. The general line is simple and beautiful, and care has been taken that the room should not be overcrowded; but the two armchairs in the ingle nook ensure comfort. No. 3 shows the bow window of the same room, with upholstered seat and blue curtains to shade with the carpet. A built-in dresser provides a further attraction. In No. 2 is seen another style of dining room carried out in red and brown. This room is less spacious, but its possibilities have been well exploited. Note the curtains which can be drawn across the ingle nook to give added cosiness when the room is being used as a sitting room. General hints as to the planning, furnishing and arrangement of dining rooms are given in the text together with further illustrations.

packing pieces are then fixed to the centre panel at the sides so as to obtain extra thickness for the two top guides which are stub-tenoned underneath. These guides are 3½ in. deep with slots cut near the bottom into which stops are fitted after the top is put in position, thus preventing any possibility of the top being lifted right off.

The bearers are cut from 1¼ in. stuff. 2 in. thick, and tapered at one end Fig. 2 shows where taper commences. As the top is 1 in. thick, it will be required to taper the bearers 1 in. so that the extensions will be raised just this amount. The taper commences about ¾ in. in front of the inner edge of the extension, so that when open the main top will rest upon the same surface as the extension (In the middle, of course, the top is supported by the centre cross piece.)

The notches are now cut in the end rails of the table, so positioned that the bearers at one end will fit just inside those at the other end; in depth they are cut just the thickness of the bearers at that point when the table is closed. The bearers are now screwed to the extensions and the whole job is assembled.

Guides are fixed as in Fig 4; these are deep enough to take the cross pieces, which are screwed on to prevent the extensions from being lifted up. Apart from this they take no actual strain, the whole weight being divided between the end rails and the centre cross piece (Fig. 2). Stops are fitted to the underside of the bearers to prevent them from being pulled right out. When the movement is tested, the table should be tried to see that when opened the whole top is in a straight line; also that the extensions bed right down firmly without any give in any of the corners. A good lubricant for the bearers is ordinary candle grease.

A Telescopic Table. Fig. 7 is an example of the telescopic table. To open, it is simply pulled out at each end and a loose leaf inserted in the centre. In this case the legs move with the top, there being two rails at each side, kept rigid by a tongue.

A table of this description could, by the addition of extra rails or slides, be made to extend considerably, being operated by means of a revolving screw.

The legs are made out of 4 in. mahogany, and are marked out for the mortises, allowance being made in the height for the castors. It should be noticed that in the one pair of legs the mortises are set nearer to the middle to take the inner rails (Fig. 12). The mortises are ⅝ in. wide and should meet; the legs are then marked out to shape and tapered accordingly. The end and outer rails are 4 in. by 1 ¼ in., and the inner rails 3 in. by 1¼ in. The reason for the latter being 1 in. less in width will be obvious from Figs. 8 and 9, since the cross rail fastened to the outer rails will have to pass under them.

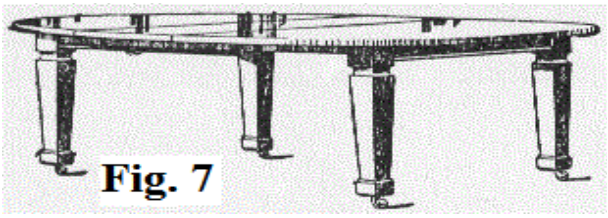
The tenons of all the rails are marked out and cut, and it will be observed that those of the inner and outer rails occur at one end only, the other ends being cut off square. The grooves in the rails are gauged from the top edges and ploughed to a depth of ½ in.; they are ¾ in. wide. The tongue is then glued into the groove of the inner rails and allowed thoroughly to set. All rails and tongues should be of hardwood, which is essential for all work of this kind.

At a distance of 1 ½ in. from the square ends of the rails cross rails are dovetailed underneath (Fig. 10). It is essential that these cross rails should be marked out to the exact length, as one pair of rails must fit just inside the other, forming two sets of exactly parallel rails (Figs. 11 and 12). The dovetails are supplemented with screws.

The various parts are now glued up, each pair of legs with its accompanying rails forming a complete set. When dry the two parts are fitted into each other and two stops screwed to the top of the lower cross rail (Fig. 11). When fixing these, allowance must be made for the table to open about 1 in. more than is required when the leaf is put in, as this is fitted with short dowels (Fig. 13). The moulding is then glued to the outer rails, as indicated in Fig 10.

For the top thoroughly seasoned timber must be used; it will be necessary to joint this, the shape being cut afterwards. The best way to mark this out is to use a thin lath with a pin driven through near one end to use as a centre, and revolve the lath round this, holding a pencil at the other end. The two fixed tops are pocket-screwed to the rails, as in Fig. 10. Short dowels are glued into one side, and fit into corresponding holes at the other (Fig. 13). The leaf is also dowelled at one side, and with holes at the other, so that it will always be put in the same position whatever size of table is required.

Having screwed the top on, the joint is planed level with a trying plane; the leaf is also put in and levelled. The ends of the leaf are quite straight, and form a continuous line with the semicircular shape of the fixed tops. The edge is rounded off, as in Fig. 10, while the leaf is in, thus ensuring their coinciding. Candle grease is a good lubricant to use should the slides run stiffly; oil or any other liquid tends to expand the wood, thus making them run more tightly, which may perhaps cause them to jam.



Dining Table. Circular telescopic table. For diagrams showing the construction of the various parts see page 653.

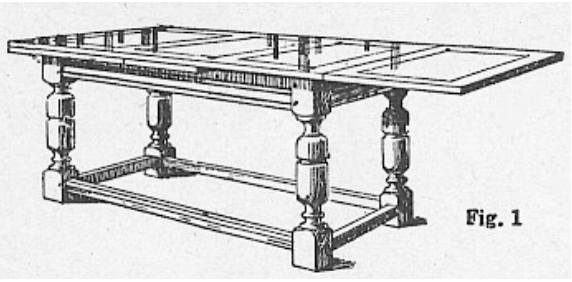


Fig. 1

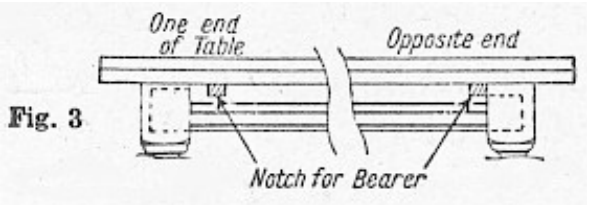


Fig. 3

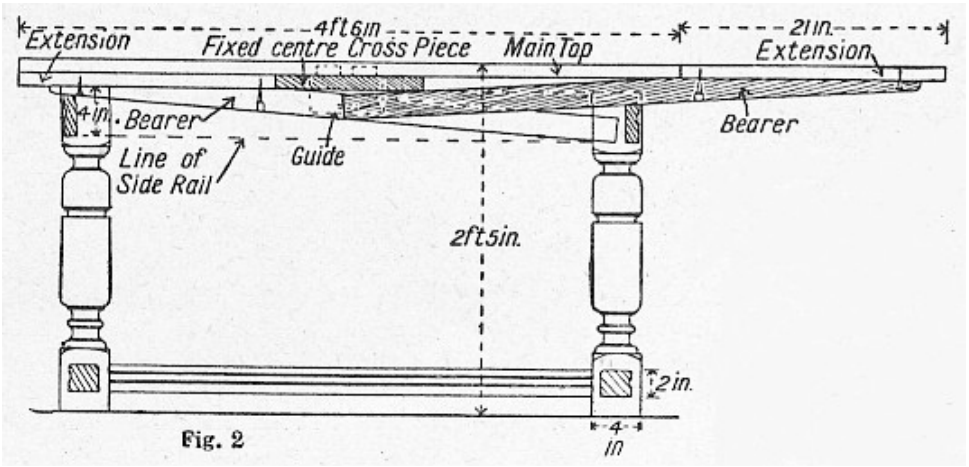


Fig. 2

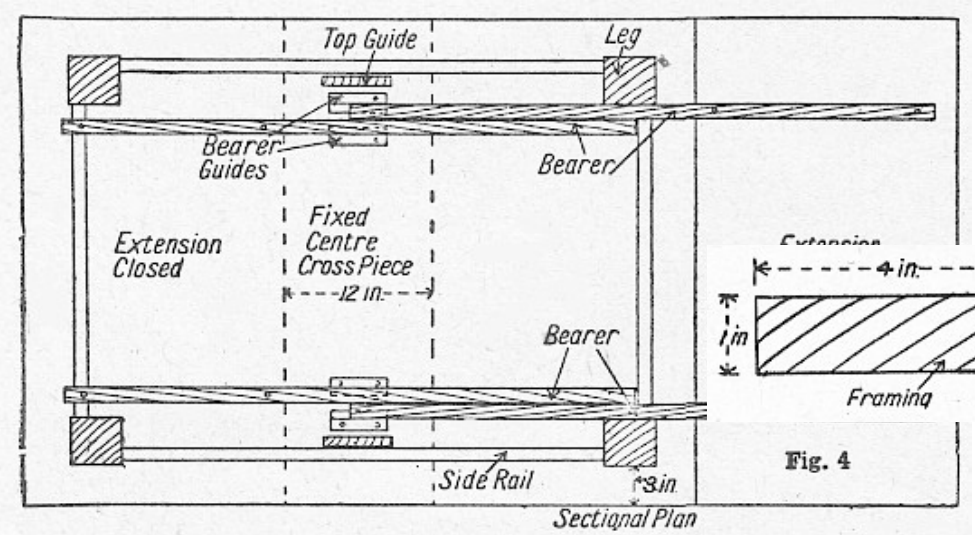


Fig. 4

Dining Table. Figs. 1-6. Useful draw table and working diagrams showing how it can be made.

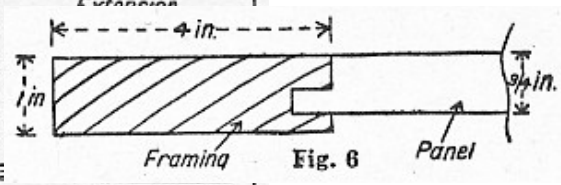


Fig. 6

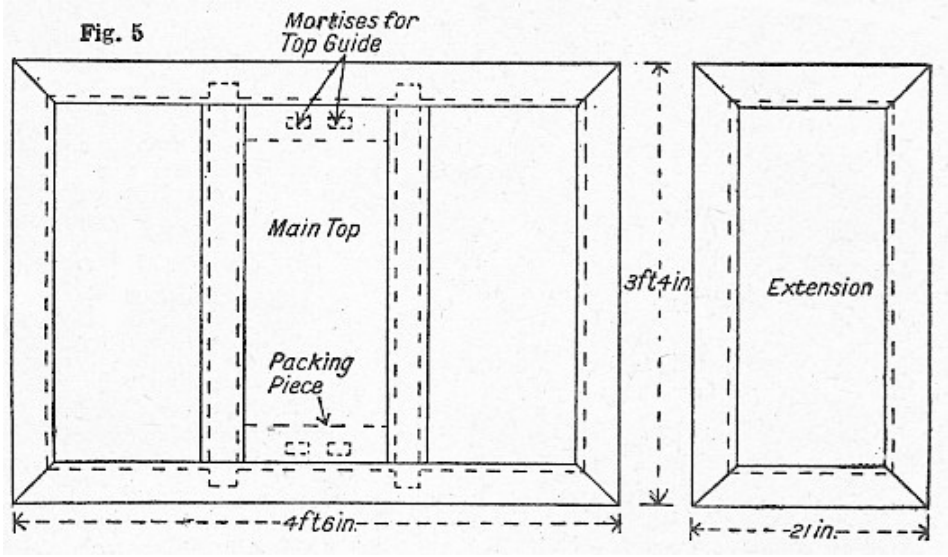


Fig. 5

DINING TABLE.

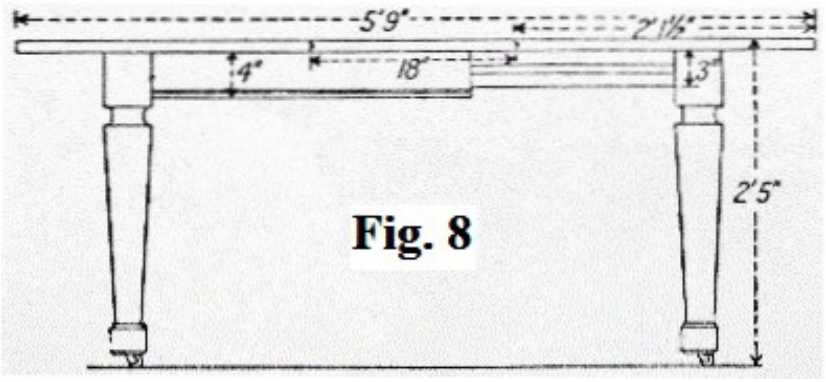


Fig. 8

Figs. 8-11. Circular telescopic table and diagrams showing the construction of the various parts. Figs. 12-13. Showing how the table is extended to an oval and how the leaves are dowelled.

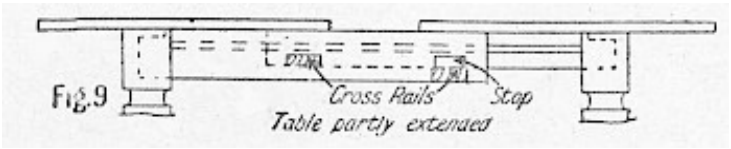


Fig. 9

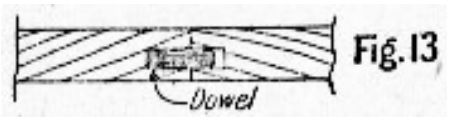


Fig. 13

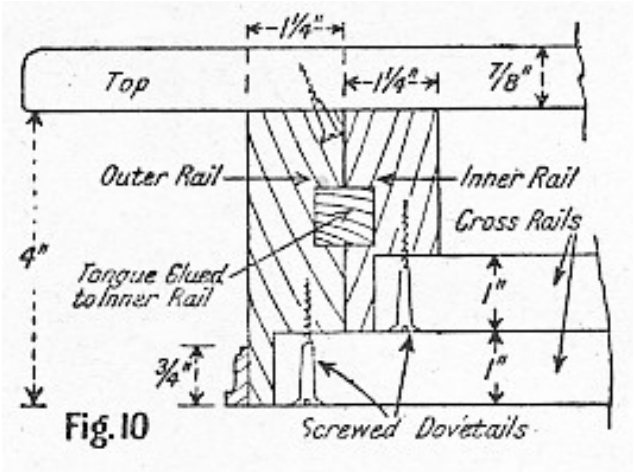


Fig. 10

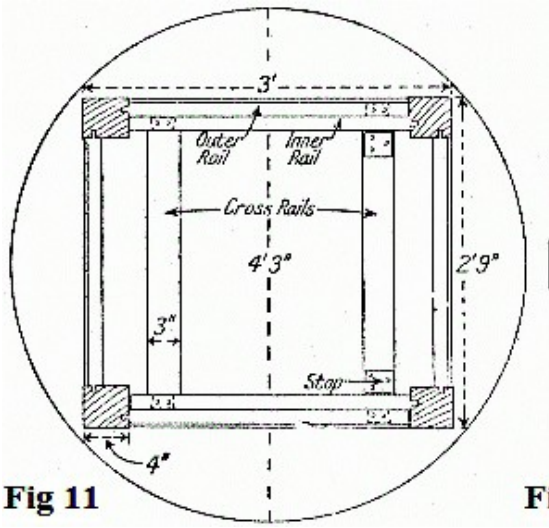


Fig 11

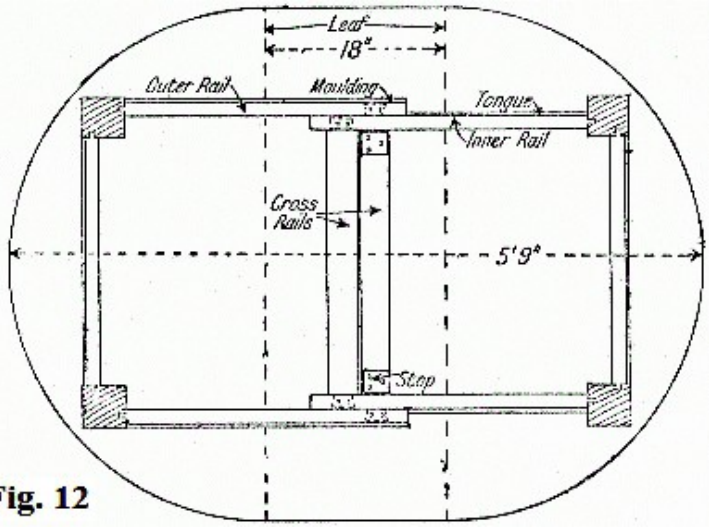


Fig. 12

DINNER AND DINNER PARTY
Suggestions that Housewife and Hostess will Appreciate

The reader may with advantage consult the article Table and the entries on the various dishes mentioned in the contribution below. See also Dining Room; Service Wagon.

The home dinner need not be elaborate, and the dishes may contain very simple ingredients; but the cooking should be good, the hot food served really hot, and the table should be attractively laid.

The meal should be served punctually. In many homes the dining room has to serve several purposes besides its use at mealtimes, and will need a little tidying and readjustment before it is ready for the family dinner. During the winter the fire should be made up and the hearth swept before the table is laid, and the windows opened to ventilate the room.

Menus should be as varied as possible, and the likes and dislikes of the members of the family considered. A good arrangement when a three-course meal is taken is to have soup, grapefruit or melon, followed by a joint, savoury or dessert, three evenings of the week, and fish, entrée, or a vegetable dish such as asparagus or salsify, and a sweet on the alternate evenings.

For evenings when the cook is out, or time for the preparation of dinner is short, soup can be prepared, a meat pie or stew that only needs re-heating left ready, and a cold sweet made in the morning.

The Sunday evening dinner usually becomes in reality supper. Soup may be the first course, and cold meat or a pie can be served with an inviting salad or sliced beetroot and hot potatoes baked in their skins: or a mayonnaise is generally liked in summer. In winter a casserole meat dish is more suitable than cold food, and a tart or steamed pudding can soon be warmed up, while a cold extra sweet can be prepared and served in the event of unexpected guests, and also additional dessert.

Such arrangements serve for an informal dinner with one or two guests, but the formal dinner party needs careful planning.

Dinner Party Etiquette. Dullness should be guarded against by inviting the right persons to meet, in the case of a small party, or by arranging the table, in the case of a large party, so as to bring together the people who are likely to have subjects of conversation in common. Another important factor of success is to give a well-cooked and well-chosen dinner; also to see that any wines to be drunk are good of their kind, and the service smooth and efficient.

In England, in large towns, the time of invitation varies between 8 and 8.45; in the country, between 7.30 and 8; about 10 minutes' grace being allowed for the guests to collect in the drawing room. Men on arrival leave their coats and hats in the hall or in a cloakroom; women are taken by a maid to a bedroom to remove their wraps. The host and hostess receive the guests in the drawing room, where they are announced by a servant. Cocktails are usually offered.

At a ceremonious party all the arrangements of guests at the dinner table, and the order of precedence into the dining room, are carefully worked out beforehand according to rank and importance. When dinner is announced the host offers his right arm to the most important woman present and takes her into the dining room. The hostess pairs off the other guests in the order of their social precedence, with the exception of the most important man present, who goes in last with her. The host places the woman he takes in on his right at the bottom of the table, the woman of second social importance being on his left. He stands until the guests are seated. The hostess sits at the top of table, with the man who has taken her in on her left.

At large parties it is quite usual to put a card with the name of a guest in each place, but where this is not done the host would tell each couple as they entered the dining room where they should sit. The necessary carving of joint, game, or poultry is done by a servant, unless the host prefers to do it, other dishes being handed round, from which the guests help themselves. The guests on either side of the host are served first, and then straight along, or round, the table to each guest in turn, finishing with the host.

If champagne is to be drunk, it is first offered after the fish, the same rule applying to claret or light white wines, and any of these would be drunk until the savoury. At dessert it is customary to place decanters containing port, sherry and claret in front of the host. If a cloth is used, it is generally removed for dessert, and in any case peppers, salts, etc., pieces of bread, crumbs and glasses are cleared away, and fresh wineglasses are placed with the dessert plates and finger-bowls. After dessert is on the table, the servants withdraw.

At the end of dinner the hostess bows to the most important woman guest and rises. This is the signal for the women to leave the dining room, the hostess going out last. Coffee is served with liqueurs and cigarettes in the drawing room and dining room. At less formal parties coffee may be served before the women leave the dining room; otherwise the men join them in the drawing room in about a quarter of an hour. In town houses, when the regular staff is not large it is sometimes supplemented by engaging skilled assistance. There are able women who specialize in cooking for dinner parties at a moderate fee, and private waiters can be obtained.

To give a successful party the hostess must not be worried over the dinner while it is in progress. It is better to think out a small menu of well-chosen dishes, comprising a soup, fish course, entree, game or poultry, cold sweets and savoury, within the scope of her resources, than to attempt a banquet, which may be spoilt.

Dinner Service. A well laid table is essential to entertaining and the charm of this is enhanced by a good dinner service. These are usually made for twelve

or six persons, and can be had at moderate prices in earthenware or semi-porcelain. The regulation service for 12 persons starts with three sets of plates—meat, pudding, and cheese, two or three dishes, two vegetable dishes with covers, and either a sauce-boat or sauce tureen with cover and stand. To this may be added 12 fish plates, soup plates, and a tureen with dish and cover. In small households and when entertaining the last item is often dispensed with, soup being served directly from the kitchen into plates, special cups or sets of bowls.

As with a breakfast service, the stock pattern may be recommended, with the suggestion, where economy of space has to be considered, of choosing the same pattern for breakfast and dinner service. In any case thought must be given to colouring and style to ensure harmony with the room or any coloured glass that may be intended for use with the service.

For better services, modern Wedgwood and Coalport china are in perfect taste and are decorated with many of the old designs.

DIPHTHERIA. The bacillus known as the Klebs-Loeffler is the germ of diphtheria, and the most striking local symptom of the disease is the formation of a greyish-white or yellow membrane on mucous surfaces, most frequently at the back of the throat and tonsils. The disease is highly contagious. Germs may be found in the throats of apparently healthy people, and in some the microbe is not virulent, but in others it is, and they are diphtheria carriers.

The disease may begin with chilliness and other signs of fever, the temperature being raised 2 or 3 degrees. Next day the throat is sore, angry and red, and some hours later there is a grey or yellowish patch on the tonsils or the back of the throat. Frequently there is no complaint of sore throat, and diphtheria may exist for several days without its presence being suspected. Parents would probably save much trouble if they would make a practice of looking at the throats of young children when they are "off colour."

The earlier the anti-toxin is given the better. If given on the first day, the disease is almost always cut short. The prospects become rapidly worse, however, the longer serum treatment is delayed.

On the first suspicion of Diphtheria the patient should be isolated, preferably in a large top-floor room with plenty of fresh air. One person only, who is to look after the case throughout, should be allowed to visit him. Clothing should be put to soak in a disinfecting solution before removal from the room.

It is important throughout the disease and sometimes well into convalescence to keep the child constantly lying down in bed, as there is always a risk of heart failure occurring. After the second week paralysis of various muscles may set in. If it affects the soft palate there is a regurgitation through the nose of any fluid the child may be drinking; if of accommodation, near objects such as print cannot be seen distinctly; if of the limbs, there is weakness in using them.

Cleansing the throat is not necessary after anti-toxin has been given unless there is foetor, when the throat may be swabbed or sprayed with boracic lotion. If the child struggles against swabbing it is better to discontinue it rather than risk exhaustion. The nurse should wear a mask or protect the eyes with goggles, and if any mucus is spluttered on her face it should be washed off with an antiseptic lotion. Swabs of cotton wool should be used for wiping the face and cleansing the nose. They should be burnt at once. If a croupy cough develops, a bronchitis kettle (q.v.) should be used. To relieve the pain and swelling in the throat, hot applications may be applied to the neck, or cloths wrung out in iced water. The diet should be entirely liquid, milk and broths, and as much water as the patient wishes. Steel drops or tincture of perchloride of iron is a useful medicine in doses of 3 to 5 minims.

The patient is not allowed out of isolation till 3 weeks after the throat is normal in appearance, and not till 2 swab tests at 3 days' interval are negative. Persons who have been in contact with cases should be in quarantine for a week, and each day the throat should be inspected for evidence of the disease. "Carriers" must have their throats disinfected. By inoculations into the skin, in the Schick test, it can be determined whether or not a person is very liable to contract the disease. Protective inoculations can be given to those who show little or no resistance. *See* Disinfection; Notification.

DIPPING FORK. A two-pronged fork that is known among manufacturing confectioners as a dipping fork is considered essential for sweet-making purposes. It is used for lifting out centres which have been dipped in chocolate or some other coating mixture and placing them aside to dry. Dipping forks can be obtained at small cost from any ironmonger's. *See* Chocolate.

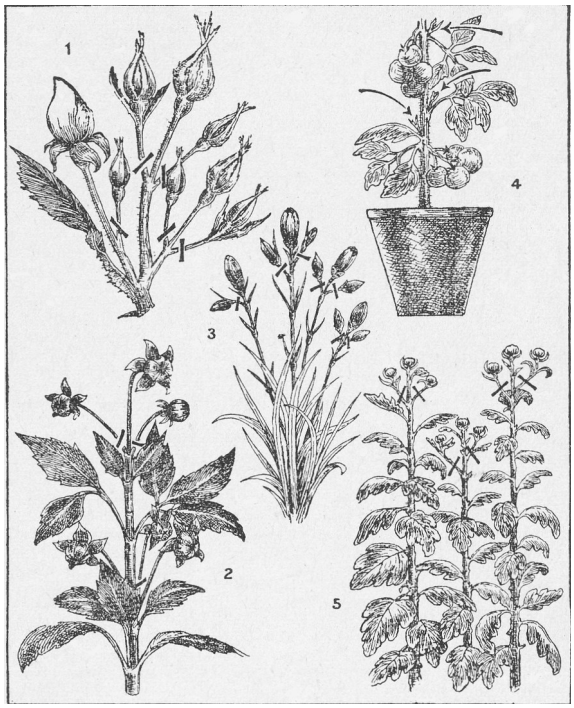
DIPSOMANIA. Periodical attacks of an uncontrollable craving for alcohol, coming on at intervals of a few weeks to a year, and due to hereditary influences, are the symptoms of dipsomania. Between the attacks the victim has no desire for alcohol and may even dislike it. An alteration may be noticed in the patient just before he is overwhelmed—differences in his behaviour, sleeplessness, and loss of appetite. After having taken a certain amount a distaste may arise, and the drinking stops, or retching and vomiting may come on and determine the attack, or he may drink himself into delirium tremens.

Apomorphine, by producing nausea or sickness, may be successful in preventing or cutting short the attack. Capsicum and cinchona have been suggested as a useful substitute for alcohol in relieving the craving, as in the following mixture: Tincture of capsicum, 1½ drams; fluid extract of anchona, 2 drams; syrup of ginger ½ oz.; chloroform water to 6 oz. Take a tablespoonful, when necessary, in a wineglassful of water. When employed by experts, hypnotism has been

most successful in some cases in combating the craving and preventing attacks. *See* Delirium Tremens.

DIRECT CURRENT. This is an electric current which flows round a circuit in one direction, as distinct from alternating current (q.v.), which is constantly changing its direction. *See* Electricity.

DIRECTOIRE: The Style. This style of furniture originated in France at the time of the Directory (1795-99). It was based on a study of Greek ideas, and its artists used in the main the constructional lines of Louis XVI furniture. The ornaments, however, were discarded and griffons, caryatides, honeysuckles and other classical figures were substituted. After Napoleon's return from Egypt the sphinx and other Egyptian decorations were introduced. During the period marquetry was no longer in demand, but chased bronze mounts in ormolu were the principal mode of decoration. Carving was mainly used in gilded imitation of ormolu work. Mouldings were comparatively little in favour. The Directoire was succeeded by the Empire style. *See* Empire Style.



Disbudding. Diagrams indicating where this operation is carried out on typical plants. 1. Rose. 2. Dahlia. 3. Carnation. 4. Tomato. 5. Chrysanthemum.
(By special arrangement with Amateur Gardening)

DISBUDDING. This means the removal of surplus shoots or flower buds so that those left on the plant shall have full room for development. Disbudding is an important detail in the cultivation of peach and nectarine trees and vines, for many more shoots grow than are needed. "Taking" the buds of chrysanthemums grown to provide large blooms means disbudding or removing the small shoots which appear beneath the flower buds in August. Disbudding is practised on carnations, roses and other flowers grown for exhibition; many of the flower buds are taken off in order to ensure that those left shall furnish large blossoms.

DISH: In Various Wares. Dishes with covers for entrees are made in silver and Sheffield plate. Plain or cut-glass dishes are used for serving dessert, trifles, jellies, etc., while earthenware and china dishes are included in dinner services or may be purchased separately in many stock patterns and in plain kitchen ware. Fireproof dishes are to be had in glass, china and earthenware with covers to match.

Dish Cover. The heavy silver or plated covers of the Victorian era are seldom seen now on account of the cleaning involved. Plain electro-plated covers are used for joints, fish or poultry dishes when necessary.

The well-equipped kitchen has a supply of wire-mesh dish covers. These should be used to cover all kinds of fresh food, cooked remains of dishes, and anything which might be disturbed by flies, beetles, mice, or other vermin. After being washed in warm, soapy water they should be shaken and dried, and then placed over the rack above the range to dry thoroughly. *See* Entree; Fireproof Ware; Washing-up.

DISH: In Photography. Dishes for photographic work must be kept scrupulously (i.e. chemically) clean. If a trace of fixing solution is left behind in a dish which is afterwards used for developing, mysterious stains will appear on the negatives or prints being developed. The best plan is to keep each dish for one purpose only.

Dishes should be thoroughly washed out immediately after use, and not allowed to stand all night with the stale developing solution in them. After washing they should be rinsed out with a strong solution of spirits of salt (hydrochloric acid). This need not be thrown away, but can be used repeatedly. Earthenware or china dishes are easier to keep clean than enamelled iron dishes, which are liable to chip; but the latter are less expensive. In either case it is well to see that they have flat bottoms. Curved dishes require more solution, and plates and paper do not lie well in them. *See* Developing.

DISINFECTANT. Disinfectants are agents used for destroying the germs of disease and so preventing the occurrence and spread of illness. These germs may be present in the air, in furniture, in clothing, and a variety of means may have to be employed to secure disinfection. Sunlight and fresh air kill most germs, while plenty of soap and water is one of the cheapest and most efficient methods to prevent their growth. Polluted water may be made safe for drinking if boiled for 10 min. Infected articles of no value should be burnt.

Chemical disinfectants include carbolic acid, corrosive sublimate (perchloride of mercury), biniodide of mercury, lysol and other substances

derived from coal tar, permanganate of potash, etc. Formalin is a liquid with a strong, irritating odour. It is usually used in a strength of one part to 20 parts of water. Lime is a good disinfectant, employed when diseased animals are buried, a thick layer of the lime being made to surround the carcass.

Linen may be disinfected in many ways. Exposure to steam for a lengthened period, repeated boiling, or boiling in soap and water and then exposing the linen to the sunshine for several days, are some effective methods. A good means of disinfecting is to soak the linen for an hour in a solution of carbolic acid, using one pint of prepared carbolic to 20 parts of water. *See* Carbolic Acid; Formalin.

DISINFECTION: Of the House. After an infectious illness it is necessary to have a house or a room disinfected. The problem is much simplified if the room has been previously prepared for the reception of such a patient. The carpet will have been replaced by one or two light rugs, heavy hangings by washable curtains. Unnecessary furniture and all books and pictures will have been removed. The only books allowed should be such as can afterwards be burnt.

In the sick room sputum and nasal discharges are best collected in paper and burnt in the fire. Infective faeces and urine should be received in a bed pan containing some carbolic or a coal tar disinfectant.

Sulphur is easiest to use as a fumigant, and for every 1,000 cubic ft. of space 4 lb. of roll sulphur should be used, or it can be obtained in the form of sulphur candles. The walls and floor should be well sprinkled with water, as sulphur vapour is only active in the presence of moisture. The sulphur is placed on a shovel, preferably at some height above the floor, moistened with methylated spirit and ignited. The door is then closed and the margins of the door and the keyhole sealed with gummed paper.

If the local authority undertakes disinfection the sanitary inspector assumes responsibility for the treatment of the room. He may destroy infected articles and compensate the owner. *See* Contagion; Formalin; Fumigation, etc.

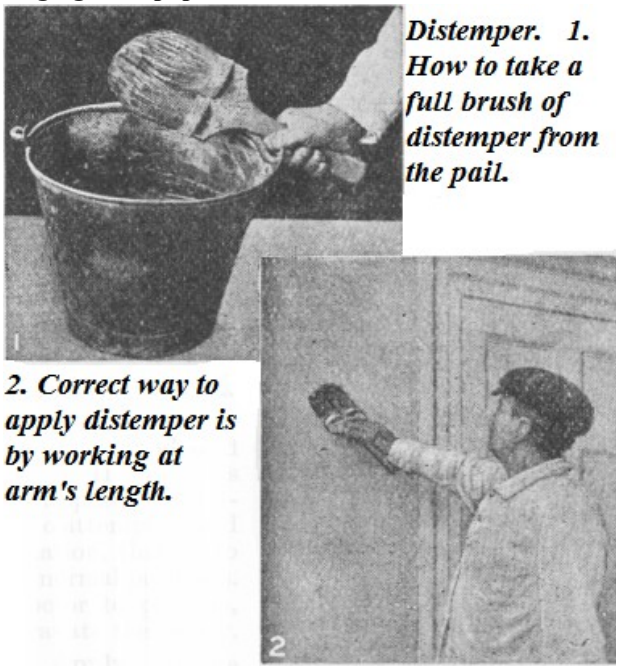
DISLOCATION. Displacement of one or more bones at a joint is the general meaning of dislocation. The ligaments which hold the bones in position are torn; the synovial membrane or lining of the joint and the blood vessels and nerves may also be injured.

First-aid consists in sending for the doctor and putting the parts at rest by slings, cushions, and, if necessary, splints, and cold applications to relieve pain. If shock is present, warmth should be applied by hot-water bottles and blankets. No attempt should be made to reduce the dislocation, that is, to put back the bones into their normal positions. This must be left to the doctor to perform, as unskilled efforts may aggravate the injury.

DISTEMPER: How to Apply. Before distempering the walls of a room they must be free from nail holes and similar blemishes. If the room to be redecorated has previously been papered, the walls must be stripped, and any picture nails removed.

Having done this, mix some plaster of Paris with cold water to the consistency of thick cream, and with it stop all the nail holes, cracks, etc., in the surface of the plaster.

The distemper may be purchased loose from any oil and colourman, but it is more satisfactory to purchase a well-advertised brand of washable distemper. Careful mixing is required to ensure an even texture. Three-parts fill an old bucket with cold water, and add the powder a little at a time; stir well with a stick. It is important not to add all the package at once, or to put the distemper in first. The liquid should be of the consistency of whitewash when ready for use, and the first coat should be applied evenly with a distemper brush. Make the strokes horizontally and work the distemper well into the wall, as when painting wood. The distemper should be stirred well during use. *See* Colour; Cottage; Decoration; House; Paint; Paper-hanging; Wallpaper, etc.



Distemper. 1. How to take a full brush of distemper from the pail.

2. Correct way to apply distemper is by working at arm's length.

DISTEMPER: In Dogs. The deadliest disease from which dogs suffer is distemper. If a young dog shows signs of ailing and is indifferent to food, he should be watched. A husky cough follows a rise of temperature, and usually there is a discharge from the nose.

To treat a dog suffering from this disease, put the animal in a moderately warm place, well ventilated, but free from draughts, and coat him in flannel; take an old blanket about the right size, and make two holes 6 or 9 in. from one end, through which the front legs are placed. Sew it up along the back, while it is all the better if the chest and sides are further protected with gamgee wool. Diet with nourishing slops, no solids.

If food is refused, he must have it poured down. Put the fluid in a wide-mouthed bottle. Hold the lips on one side, and on the other insert the bottle, drawing up the lips to prevent spilling. Several times daily cleanse the

nostrils, and wash the gums and inside the mouth with a solution of permanganate of potash. Cleanse the eyes with warm boracic lotion. On no account get on to solid food or permit exercise until temperature has been normal for nearly a week. If the case becomes serious a vet should be called in. *See* Dog.

DISTILLED WATER. This water is used for making up hair washes. It should be employed for dissolving shampoo powders, as ordinary water tends to destroy the efficacy of the powder. In making up boracic lotion for inflamed eyes distilled water should always be employed. It is also used for the accumulator of a motor car. *See* Accumulator.

In photographic work the use of distilled water is highly desirable. *See* Developing.

Preparing the Water. A simple means of making small quantities of distilled water, such as are required for developers and for other purposes, is provided by the kettle. The spout is inserted in a thistle funnel, obtained from a chemist or dealer in scientific apparatus, which is bent at right angles in the flame of a Bunsen or methylated spirit burner. It passes through a large tin, which has a hole cut in the bottom fitted with a cork; through this a hole, just large enough to allow the tube of the thistle funnel to be pushed through, is bored with a red-hot nail. This tin is kept filled with cold water.

DISTRAINT: The Law Of. The law regarding distraint has been modified by the Rent Restriction Acts, passed during and since the Great War. Under them no distress may be issued for the rent of any houses to which the Acts apply without the leave of the county court. Such houses are those of which either the recoverable rent or the rateable value in 1931 did not exceed £45 in the Metropolitan Police district, £45 in Scotland, and £35 elsewhere.

Apart from these temporary exceptions the law allows the landlord whose rent is overdue to enter the house by himself or by a certified bailiff between sunrise and sunset, seize the goods found there, with certain exceptions, and ultimately sell them to pay the rent and the expenses of the distraint. Rent is overdue the day after it ought to be paid. All goods-and chattels on the premises may be seized in distress, except certain pictures, fittings and personal necessities actually in use.

If a lodger's goods are seized, he may get them back by giving notice in writing to the landlord or bailiff. He must send a list of what he claims as his, and state that the tenant has no interest in them. Then, if the landlord refuses to return them, the lodger may at once proceed against him in the police-court, for which purpose it is better to employ a solicitor. But the lodger must also state in his notice what his rent is, and if he owes anything; and the landlord can then insist on the lodger paying future rent and arrears.

If a tenant fraudulently removes his goods so as to evade a distress, the landlord may follow the goods and distrain, and may even break open doors or windows to get at them. But he must do this within 30 days of the fraudulent removal. Goods distrained on may be sold by the landlord after five clear days from the distraint. It is a criminal offence to take away goods which have been impounded, i.e. distrained upon. *See* Rent.

DIURETIC. A substance which increases the secretion of urine by the kidneys is termed a diuretic. Water, bland mineral waters, and milk are diuretics.

Diuretics are called for in the state of fever, and the following prescription would be useful. The dose is ½ to 1 tablespoonful every 3 hours.

Solution of ammonium acetate	3 drams
Potassium citrate	1½ „
Spirit of nitrous ether	1 dram
Syrup	1 „
Peppermint water to make	8 oz.

DIVAN: How to Construct. A method of making a divan is to use a box spring mattress and mount it on feet. Fig. 1 shows the method of fixing these. The bottom canvas or covering is stripped off at the corners and a 2½ in. block rubbed into the inside corner, the grain running vertically. It may also be screwed into place. Four feet are then turned (or they may be bought already turned, having a ¾ in. dowel), and a corresponding hole bored into the block, and the foot glued into this. The canvas is cut to fit and tacked back.

Making the Mattress. Our illustrations (Figs. 1 to 4) show methods of constructing a box mattress suitable for the divan.

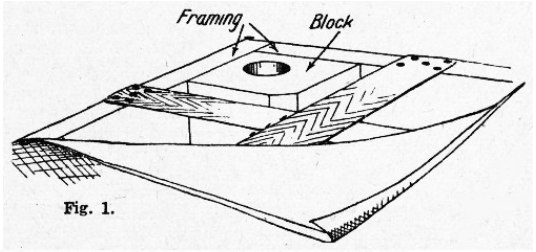


Fig. 1.

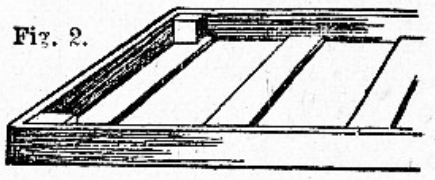


Fig. 2.

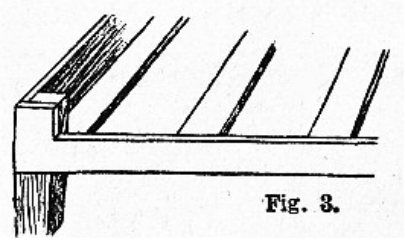


Fig. 3.

Divan. Fig. 1. Method of attaching feet to box spring mattress. Figs. 2-4. Diagrams showing construction of mattress frame and how it is sprung and stuffed.

These box spring mattresses usually finish about 10 in. to 12 in. high, and are based on a sort of tray frame (Fig. 2). A series of stretcher rails is cut in flush and screwed to under edge of sides— numbering seven, including the

two end pieces, and each about 3½ in. wide. In some cases, instead of all sides being of equal width, the head and foot sides are higher, say 7 in. wide, and the blocks are prolonged to form feet of required height, the sides being notched or let into them and screwed (Fig. 3).

The springs are placed on the rails and screwed to them by staples, and the tops of the springs are tied together with cord to counteract lateral play. They are then covered with canvas, and above this the stuffing is packed to form the mattress and also covered with canvas (Fig. 4). The whole surface is then covered with the outside ticking, which finishes at the bottom edges of the sides, the bottom of frame being neatly covered with canvas.

It will be understood from the above description that the completed box-spring is compressible at the extreme corners in addition to the centre, or not, according to the style of frame which is adopted.

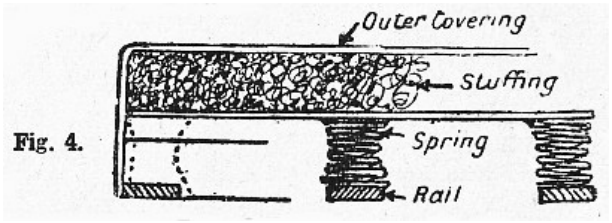
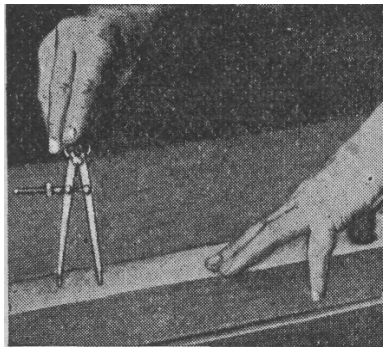


Fig. 4.


Divan. Fig. 5. Divan bed which can be made from an ottoman and a mattress. It serves the purpose of a seat during the day (Courtesy of Williamson & Cole).

Divan Bed. A divan bed, as it is called (Fig. 5) is one that serves the dual purpose of a seat by day and a bed by night. It can be made of a box ottoman (q.v.) and a mattress. The ottoman should have a stout wooden frame, padded and covered with figured material, the box being used as a receptacle for the bedding. The lid of the box should consist of a spring mattress on which the loose mattress is placed. The latter should be covered on the top with the same material as the ottoman, but underneath it should have an ordinary mattress covering. The ottoman should be fitted with castors so that it can be moved easily. By day, with the mattress for the seat and cushions placed thereon, the piece will serve as a divan. *See* Attic; Bedroom; Bed-Sitting Room; Sofa, etc.

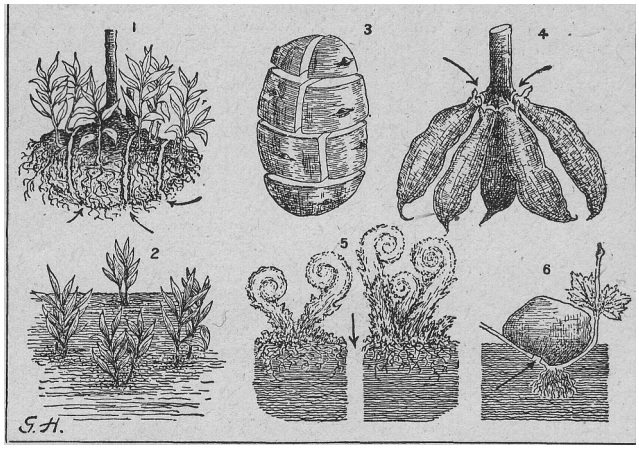
DIVIDERS. These are measuring instruments, with which the utmost precision can be obtained from hand work. Typical dividers consist of two legs of equal length, joined together at one end, and finished with a fine point at the others.


Dividers. Use of spring dividers for setting out woodwork.

Draughtsman's dividers are frequently fitted with a fine adjustment device, consisting of a small milled-headed screw, which, when turned, moves one leg to-wards or away from the other. For marking out woodwork the ordinary black spring dividers are made from one piece of steel, the action of the dividing legs being provided by the springiness of the metal. A long screw and a butterfly-nut provide a fine adjustment.

Dividers are used to set out and measure a piece of work, accurately to determine limits and proportions of a design and by them almost all geometrical problems can be solved. *See* Compasses; Drawing.

DIVISION: In Gardening. This is the term given to the method of propagation practised in increasing the stock of hardy herbaceous perennials and a few shrubs. Plants which bloom in spring or early summer are divided in autumn; those which bloom in late summer and autumn are divided in spring. The work is carried out by lifting the plants, separating them into pieces each with roots attached, discarding the old inner pieces and replanting only the young outer portions. Most of the favourite border plants, e.g. Michaelmas daisy, helenium, Shasta daisy, phlox, flag iris, erigeron or summer starwort, perennial sunflower, and coneflower or rudbeckia are increased in this way.



Division. Diagrams showing various methods of dividing. 1. How to treat perennials, the divisions being replanted in groups, as in 2. 3. Potato divisions, each containing an eye. 4. Dahlia root, points of division indicated by arrows. 5. Fern crown, divided for replanting. 6. Loganberry sucker, rooted and divided as shown by arrow. (By special arrangement with Amateur Gardening)

DIVORCE. Divorce in England is granted, under the Matrimonial Causes Act, 1937, to either husband or wife for:

(1) Adultery; (2) Desertion for three years; (3) Cruelty; (4) Incurable insanity for five years.

Except in very special circumstances no petition for divorce can be presented until three years after the marriage.

If the offended spouse, with knowledge of the offence, continues to have marital relations with the offender, the offence is said to be condoned; but, if a new offence is committed, the old offence revives. Husband and wife must not act in collusion to get a divorce if they do, they lose the right to one.

At the trial, if successful, the petitioning party obtains a decree nisi, that is, a decree which does not dissolve the marriage, but the matter comes before the Court again in about six months' time, and then, unless the King's Proctor intervenes, the decree is made absolute and the marriage is at an end. It should be noticed that until the decree absolute is pronounced the marriage vows are still in force, and must be faithfully kept, otherwise the King's Proctor may intervene.

Sometimes husband or wife petitions for a divorce who has, on an occasion, been unfaithful to the marriage vows. In such a case, if he (or she) makes a clean breast of it to the judge, his lordship may grant the divorce notwithstanding the petitioner's own guilt. In all divorce cases it is hopeless to proceed without legal assistance. Petitions for divorce can be heard at various assize towns in the provinces, as well as in London and Edinburgh.

Persons who have less than £50 (in some cases £100) and whose usual income is less than £2 (in some cases £4) a week may apply for a divorce as poor persons. In this case the costs will be very small. Application should be made to the Poor Persons Department at the Royal Courts of Justice, Strand, London, W.C.2, or to a local registry. *See* Desertion; Husband; Marriage; Separation Order.

DIZZINESS or Vertigo. Any passing attack of giddiness is probably due to disorder of the digestion or constipation, but it may be the result of any one of a large number of causes. Chronic gastritis is very likely to be accompanied by dizziness.

In these cases the patient should carefully inquire into his diet, the state of his teeth, and his habits with regard to taking food. In some cases it will be found that abstaining from liquids at meals, and taking them only between meals, is helpful. Fats and pastry should be taken moderately. Old people should eat sparingly. Haste at meals often causes digestive trouble. If necessary one may take an occasional mild aperient (q.v.). Excess of tea, alcohol or tobacco may be responsible.

In neurasthenia dizziness is a common symptom. Treatment must be directed to the cause. People getting on in years whose arteries are becoming inelastic, find that they often suffer from dizziness. It is not wise for them to get up quickly when sitting or lying down; to empty the bladder immediately on getting out of bed in the morning; to make any sudden violent movement such as jumping on an omnibus. Excitement should be avoided as far as possible, and the food should be light and nutritious.

Ear and Eye Trouble. The ear is often a source of this trouble. Collections of hardened wax, mixed as they frequently are with hairs and dust, may for a long time be the unsuspected cause of dizziness. The wax should be removed by soaking for a night with oil and gently syringing with warm water. A running ear may be accompanied by dizziness. In Menière's disease of the ear, dizziness is a most prominent symptom.

The eye may also be the cause of the dizziness. Errors of refraction are indeed a very common cause of a slight degree of this trouble which is cured by suitable glasses. Dizziness is associated with many serious affections, such as disease of the heart, tumours of the brain, syphilitic affection of the brain, epilepsy, etc. Much worry will be saved by a timely visit to a doctor, as in the great majority of cases the cause is one which can easily be remedied.

DOESKIN. A material much used for gloves, doeskin is a leather which has been degrained by the removal of the upper surface. Thicker and fuller than ordinary kid, it is less heavy than buckskin, and is obtained from the skins of various animals. *See* Glove.

DOGS: CHOOSING, TRAINING AND FEEDING
With Information on Other Matters of Daily Interest to Dog Owners

This entry is supplemented by articles throughout the work on the various breeds of dog, e.g. Airedale; Collie; Retriever; Sealyham, etc., where the illustrations of the various types appear. See also Animals; Distemper; Kennel.

At the present time between 80 and 90 different breeds of dog are recognized by the Kennel Club. There is thus a very large selection from which to make a choice but a great deal depends upon individual taste, as well as the accommodation at hand. The heavy breeds comprise the St. Bernard, Newfoundland, mastiff, Great Dane and the bull mastiff, all of which are costly to keep and require a fair amount of exercise to keep fit and well. Any one of them will cost from 8s. to 10s. per week to keep, no matter how carefully fed. The mastiff, the bull mastiff and the Great Dane are smooth-coated dogs and so give less trouble with regard to grooming than do the St. Bernard and the Newfoundland. All are equally useful as guardians of personal property, and the Newfoundland is an excellent water dog.

Following these dogs in point of size, mention must be made of the Alsatian wolf dog, Irish wolf hound, deerhound, Afghan hound, bloodhound, Old English sheep dog, elkhound, greyhound and collie. All these

dogs can be trained for companionship or specifically as guards. Their cost of keep ranges from 5s. to 8s. 6d. per week. The most popular of all is the Alsatian, if we except the greyhound and the retriever.

The retrievers and spaniels are particularly useful dogs. Perhaps the most useful all-round dogs are the terriers, which comprise the Airedale, Bedlington, Border, Cairn, Scottish, Dandie Dinmont, West Highland White, Skye, Fox (smooth and rough), Irish, Kerry Blue, Sealyham, Bull Terrier and Manchester. Here we have a group of first-class dogs, equally good for waterside work or for watching and companionship. The terriers cost very little to keep and make excellent friends with man. Two terriers recently introduced are the Schnauzer and Lakeland. The terriers of Scotland are all short legged, big boned and broken coated, but the bull terrier and the Manchester terrier, likewise the smooth fox terrier, are smooth coated. Handy little dogs are the Cairn terriers, likewise the Sealyham and Welsh terriers, but perhaps the most popular are the Kerry Blues, the wire-haired Fox Terrier and the Sealyhams. The Dalmatian, the collie, the chow-chow, the bull dog, the Pekingese, the Brussels griffons, the King Charles spaniel, pugs, poodles, Pomeranians, whippets, French bull dogs, Dachshunds, Keeshonds and Samoyeds, are admired by many people, and it is purely a matter of personal choice as to which of these may be selected.

Feeding. Given the ordinary standard of health and not less than a year old, a dog should be fed once a day. and the best time for this purpose is between one and four p.m. If it is convenient it is a good plan to exercise the animal beforehand. Dogs differ considerably in their habits of feeding. The pet should not be spoiled by feeding it on tit bits, but should be trained to eat properly cooked flesh food, which all dogs must have in order to maintain health. Supplemental foods such as dog biscuits, boiled rice, bread, etc., are useful for giving bulk to the food, but the use of oatmeal or maize meal will sooner or later lead to the production of skin trouble. Such dogs as retrievers, spaniels and collies, etc., should have one pound of flesh per day, the terriers ½ to ¾ lb., whilst toy dogs ¼ lb. to 2 oz., with or without bread, hound meal, etc. Dry foods are better for dogs than those of a sloppy nature, more especially old dogs, but it is generally necessary to mix the meat with soaked, stale bread or hound meal, squeezing out any excess of water.

Table scraps and bones commonly form part of the domestic dog's menu, but the dog's stomach should not be made a receptacle for the kitchen refuse. One large bone per week may, however, be allowed for a tooth brush and to assist digestion. Dangerous bones are found in chickens, hares, rabbits and fish, and these are liable to become lodged in the back part of the mouth or throat, whilst their sharp edges may easily lacerate the gullet, perhaps with fatal results. Boiled carrots are the best vegetable of all and improve the condition of some dogs. Dog biscuits in their various forms usually contain dried meat and are extensively used (either dry or soaked) as a food for dogs.

Water for Dogs. Dogs that are free drinkers generally thrive better than those that take very little water. No matter whether a dog is kept in or out of doors, it must always have a plentiful supply of fresh water. In summer all dogs drink more water than in winter, so the water trough should be refilled at least twice a day and kept in the shade. Both milk and tea are very good for dogs, the former being an excellent nutrient and the latter a mild stimulant. From 1 gill to 1 pint of milk per day will increase the weight of a debilitated dog.

Exercise. Road traffic renders the highway very dangerous for dogs and quite a number of people exercise their dogs on the leash only. This does not take the place of freedom, but it is better than no exercise at all. Facilities for exercising vary, and the majority of dogs can be easily exercised, whereas greyhounds and whippets require training on hard roads in order to keep their toe nails properly worn down. Dogs that are too fat must have gradually increased exercise in order to tone up heart, lungs and muscles. Never exercise a dog behind a motor car, or at such a speed as will entail suffering. Sore feet may easily be produced by prolonged exercise, especially on flinty or sandy ground.

Training the Dog. The sooner the training of a puppy commences the better, whether to be trained for work with the gun, for ratting or for some other particular purpose such as minding sheep or cattle, the guardianship of person or property, etc. Every dog must be taught to be clean in its kennel and in the house, which can be done by the force of habit and suggestion obtained and obtainable by the repetition of exercise at frequent intervals and by feeding the animal at the same time daily. Dogs have a desire to urinate frequently, and when two or more are kept together one or the other will suggest this act and become a nuisance, especially if living in the house. It is, therefore, very much better to keep them apart or in separate kennels if this can be done. Further, allow very little liquid after 4 p.m. Puppies are, of course, nearly always urinating, so that they require to be lifted and taken into the open four or five times a day.

Every dog must be trained to follow at heel, as this constitutes the basis of obedience, and training to follow in and out of traffic is the best safeguard against accidents. This schooling may begin when the puppy is two or three months old. Put a collar on him and to this fix a check cord, say three or four yards in length, so that you can gradually shorten the cord as each lesson proceeds; bring the puppy closer and closer to heel at the word of command, which is "Come to heel," gradually substituting the word "heel." To prevent the puppy from chasing other dogs, cats, fowls, etc., use the word Ware (pronounced war) thus "ware cat," etc., the frequent repetition of which will prevent the puppy from breaking away and render it free from chase.

Never allow a dog to roam the streets, as this leads to most objectionable habits.

Grooming. A healthy coat means a healthy skin, and the health of the latter depends upon a healthy constitution. The appliances necessary for keeping the coat in proper order comprise a dandy brush, or one with stout bristles, a hair glove, a chamois, a comb, and a stripping comb. This appliance has very fine and short teeth; therefore it must be used with a certain amount of care in order to avoid abrading the skin. Pass the comb through the long, soft hair and at the same time use the fingers to remove it, so that plucking and combing run together. The shoulders, around the ears, behind the elbows and the hind quarters should receive special attention.

When a dog comes in wet and muddy it should be allowed to go into a deep bed of straw, and when thoroughly dry should be rubbed down with a wisp of straw and the mud brushed off with a dandy brush. If a long-coated dog is not combed daily, the coat and leathering become felted and then trouble begins. A coat that is healthy has a pleasant feel, whilst the skin is soft and pliant, and free from any redness or irritation, or causes which produce the latter, such as fleas, lice, ticks, etc. Take particular care to see that the inside of the ears are kept clean by sponging them out occasionally with equal parts of hydrogen peroxide and water.

Care of the Teeth. Never neglect to make periodical examination of the dog's teeth; otherwise trouble may arise, as nothing can be worse than offensive breath from a foul mouth. Incrustations upon the teeth are common and the discoloration of the latter frequently occurs during distemper, but can be minimised by cleaning the teeth with equal parts of hydrogen peroxide and water. Loose teeth, spongy and bleeding gums (pyorrhoea) are the precursors of digestive disturbance.

The Dog's Bath. Grooming should obviate the necessity for frequent bathing, but the bath sometimes becomes a necessity. Soap and water will cleanse the coat, but it renders the hair soft, and in course of time destroys its texture. Under ordinary circumstances a bath at the commencement of the four seasons of the year ought to be sufficient for any dog. The proper manner to bath a dog is to wet thoroughly the back and hind quarters, under the tail, between the thighs, and on the belly freely with warm water; then rub in the soap with the fingers, leaving no part untouched. For adult dogs a good carbolic soap is the best. Repeat this process on the fore part— then rinse the soap out with warm water. This will kill the fleas if the work has been properly done. A medicated bath consists of the addition of some drugs, such as 4 oz. of Epsom salts to each gallon of water for the cure of simple skin irritation, or else 2 oz. of sulphurated potash to each gallon of hot water, but it is much better to dissolve this in a quart of boiling water and then add to bath. This last remedy is useful for destroying lice, fleas, etc., but it must be repeated at least twice weekly for three weeks in order to render it efficient.

Administering Medicines. Dogs, like all other animals, are liable to a variety of diseases and accidents. To give a dog medicine, either in powder, pill or liquid form, is usually, but not always, a simple enough matter to those who have had practice. The pill and the tabloid are the simplest to administer. First of all open the mouth with the left hand, take the pill between the tips of the index and second finger of the right hand and then, with dexterity, place it on the extreme back part of the tongue, closing the mouth almost simultaneously, keeping it shut until the dog swallows. Some dogs will hold their medicine a long time: others swallow immediately.

Powders are usually simple to give and may be dropped on the back part of the tongue, whereas liquids require to be given slowly. To administer the latter put the fluid in a small vial and with the right hand insert the neck of the bottle into a pouch formed by the dog's cheek on the right hand side, keeping it in position by encircling the bottle neck and cheek with the fingers. Sometimes tasteless medicine can be mixed with the food, or dissolved in the drinking water, whilst a very good way to give pills and tablets is to camouflage them by sinking them into a piece of meat. Worm medicines usually require to be given on the empty stomach, or one that is partially so; therefore adult dogs should be fasted 24 hours beforehand, but puppies need only to be kept without food from six to twelve hours. These are commonly infested with round worms, and the best remedy is santonin given in oil, say castor oil. The dose ranges from ¼ to 2 grams for puppies about one month old. A common medicine is areca nut in powder and the dose is 1 grain, or 2 grains for each pound weight of the dog, given in milk or mixed with butter to form a bolus.

The normal temperature of the dog may be said to be 101° F., but slight variations up to 102° F. are common and the temperature rises during exercise. Temperatures of 104° F and 105° F are frequent in febrile affections. The clinical thermometer is used for taking the temperature, and the right situation to ascertain the body heat of the dog is the lower end of the bowel, i.e. the rectum.

Diet in Sickness. When a dog is ill it is necessary to devote attention to its food and feeding, in fact in severe illness everything depends upon attention to this matter. For instance, if a dog is troubled with vomiting, it must have small quantities of milk and soda water, keeping it entirely without water. Boiled fish, boiled tripe, malted milk, Brand's essence, Valentine's meat juice, Ovaltine, etc., should constitute the sick dog's diet and the greatest point of all is that of giving the nourishment in small quantities and often. The white of egg beaten up is excellent in stomach and bowel troubles, whilst for urinary affections barley water is best.

Diseases and Accidents. Catarrhal diseases affecting the dog are distemper, catarrh, laryngitis, bronchitis, and pneumonia. The commonest of these is distemper (q.v.)

Intestinal maladies comprise worms, diarrhoea, dysentery, inflammation of the bowels or stomach and vomiting. Jaundice or the yellows is not uncommon in the dog; in fact, it has been the hound master's bane.

Cutaneous affections are very common amongst dogs, more especially those which are fed on unsuitable food and lead sedentary lives. These skin complaints are known under various titles such as red mange, blotch, surfeit, eczema, etc., most of which are constitutional in their origin. In these cases professional advice is necessary.

Eye affections are fairly frequent in dogs, and comprise ophthalmia, opacity, ulceration of the cornea, and cataract. Cataract is a disease of the crystalline lens and mostly occurs in old dogs, as senile cataract. It causes partial or complete blindness. Eye troubles, like those of the ear and skin, require professional skill for their proper treatment.

Fractures and contusions are usually the result of direct violence. A fracture may be simple or compound. In the latter case there is a wound in addition to the broken bone, and this complicates matters. Very often the organs contained in the chest or belly are contused; therefore it is necessary to take the dog to a veterinary surgeon.

Wounds. These are usually produced either through fighting or direct violence, and owners should always be careful to ascertain the extent of the injury. A wound may appear to be a slight one externally, yet considerable laceration may have occurred. First of all cut the hair off all around the wound, and soak it well with tincture of iodine, but do not wash it. The bleeding must be stopped. Wounds on the ear, especially the margin, as a rule bleed very freely; therefore dress with iodine and fasten on a compress by means of glue or seccotine, leaving this dressing on until it drops off, unless circumstances demand other treatment.

Poisoning. Dogs are sometimes accidentally or maliciously poisoned, and very often through rat or mouse poison, though occasionally by strychnine. As a rule the best plan is to give a smart emetic, for which purpose there is nothing better than ipecacuanha or antimonial wine given in doses from 1 dessertspoonful to 2 tablespoonfuls without water. The dog will usually vomit shortly afterwards.

Mother and Puppies. The normal period of gestation in the bitch is 63 days, but a few days before or after the prescribed period for labour to occur is common. It may, however, be delayed through the death of the puppies or some other cause. If the owner has any suspicion that all is not well he should immediately consult a veterinary surgeon. The signs of approaching labour are restlessness, lacteal secretion, and abdominal pain. Owners should always prepare suitable accommodation for a bitch about to become a mother, and this ought to be in a quiet place. Disturb her as little as possible, but as soon as she has completed her task give her a dose of castor oil, cleanse her with soap and water, and take care to feed her generously on cooked meat and broth, boiled rice, etc. Wean the puppies when they are four weeks old, and as soon as weaned feed four times per day on milk and farinaceous food with a little minced meat. Later on feed three times per day on more solid food.

Homes for Dogs. There are several homes to which dogs can be sent, the oldest being at Battersea, London. Anyone losing a dog in the metropolitan area should at once inform the police, and then visit the Home, where all strays are taken except those found in certain parts of north and east London; these are sent to Willesden and East Ham. Unless they are diseased they are kept for seven days, and may then be sold or destroyed. All dogs not claimed within the seven days become the absolute property of the committee. A purchaser will have to give an undertaking that the dog is not to be used either for experimental or for stage purposes.

At Shooters' Hill, London, S.E., the Blue Cross Society have kennels for dogs that must go into quarantine. The society also take charge, for a fee, of dogs when their owners go away from home. Many veterinary surgeons also take in dogs at such times.

Clubs and Shows. The chief club for dogs is the Kennel Club at 84, Piccadilly, London, W. Another is the Tailwaggers' Club at 58, Mark Lane, London, E.C.3, and, in addition, there are a number of others, some being specifically devoted to the interests of a particular breed.

The breeding of dogs is encouraged by numerous shows. Some of these are general, while others are devoted to a single breed. The chief show is Graft's Dog Show, which is held in the Agricultural Hall, Islington, every February. It was started in 1886 for terriers only, and has now nearly 10,000 entries, these including every recognized breed of dog.

Licences for Dogs. Throughout Great Britain every person who keeps a dog over six months old must take out a licence, obtainable at any post office. This is not necessary in the case of farmers, who may keep up to two dogs to assist them on their farms, for the purpose of tending sheep or cattle. A sheep farmer may obtain exemption for more than two dogs. Exemption must be obtained by making a declaration, the form for which may be obtained from the local post office. Dogs used by the blind are exempt; so are hounds under 12 months if they belong to a master of hounds. The cost of the licence is 7/6 in Great Britain and 5/- in Northern Ireland.

If any person is found in sustody or charge of a dog, or the animal is found in his house or premises, he will be deemed to be the person who keeps the dog, unless the contrary is proved. The penalty may be as high as £5: and any excise officer or police constable is entitled

to ask him to produce his licence, and he may be fined up to £5 if he does not comply with this demand within a reasonable time.

The Law About Dogs. For some purposes a dog is not property, i.e. it cannot be stolen at common law, but in 1861 it was made an offence punishable by six months' imprisonment to steal a dog.

The Ministry of Agriculture and Fisheries may make orders providing for the regulating and muzzling of dogs and keeping them under control in any particular district, and for prescribing and regulating the seizure, detention and disposal (including slaughter) of stray dogs and dogs not muzzled or under proper control. A local authority may, if satisfied that there is a mad dog, or one suspected of being mad, in its area, make an order placing such restrictions as they think expedient on all dogs which are not under the control of any person during the period of the order. Such an order must be published prominently. Anyone who thereafter contravenes it is liable to a fine of 20s. The owner of a dog alleged to be dangerous may be summoned before a magistrate's court and ordered either to keep it under proper control or to have it destroyed. Any person failing to obey such an order is liable to a fine not exceeding 20s. a day.

Stray dogs must not be kept by the persons finding them, but must be either returned to the owner or taken to the nearest police station. If the finder wishes to keep the dog he can obtain a certificate stating full particulars of the dog. In this case he must keep the dog in his possession for at least one month. Police officers have the right to seize dogs which appear to be stray dogs, and detain them until the owners claim them and pay the expenses. Should any stray dog so seized be wearing a collar giving the address of its owner, or should the police know who is the owner of the dog, due notice must be given to the owner in writing saying that the dog will be sold or destroyed if not claimed within seven clear days. Imported dogs may be ordered to be detained in quarantine for a particular time. Such orders are commonly made in an outbreak of rabies.

Every dog in a public place mast wear a collar with the name and address of its owner. This does not apply to dogs used for sporting purposes, for destroying vermin or for driving sheep or cattle. A dog without a collar is liable to be treated as a stray dog. The owner and the person in charge are also liable to a fine up to a maximum of £50.

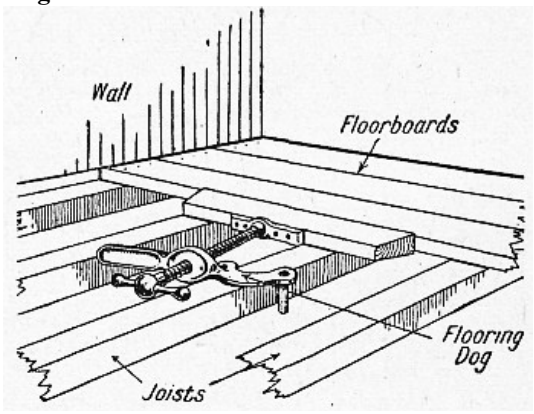
Any motorist who runs over or injures a dog must stop and give his name and address to the owner or person in charge. Otherwise, he must report the accident to a police constable or police station within 24 hours. (Maximum penalty—first offence, £20.)

Every dog which is suspected of having rabies may be slaughtered. When there is an outbreak of foot and mouth disease an order prohibiting the removal of animals may include dogs. It is illegal to use dogs as draught animals.

Damage done by dogs is the subject of a rather curious order. At common law the owner of a dog was not liable if it bit or worried any person or animals unless he knew that it was a vicious animal.

Later the owner was made liable for any damage done to cattle or sheep, without proof of knowledge, and in 1928 the principle was further extended. In Great Britain the owner of a dog is now liable for any injury done by it to poultry, just as he is for injury done to cattle, horses and sheep.

DOG: In Woodwork. Employed for temporarily holding two pieces of woodwork together, a dog consists of a bar of steel bent over and pointed at each end. The ends are driven into the wood. The dog is placed so that one end is fixed into the standing part and the other end into the other piece, so far as possible in a diagonal manner.



Dog. Flooring dog, showing how it is used to close up floorboards.

Many otherwise difficult jobs can be put together with dogs, such as the erection of a framed building; the first section is erected, and the next held in place with the dogs while the bolts are adjusted, the dogs being then removed.

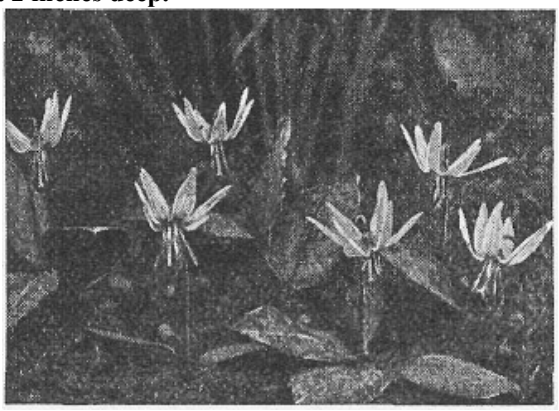
Flooring dogs, employed when laying a flooring of boards, have two prongs formed on the end of a bar, which is tapped to take a screwed rod having a handle at one end and a pad piece at the other. The prongs grip the floor joists, and the screw is used to tighten the boards in the manner shown in the diagram, one dog at each end of the board. This ensures a good tight joint, and is of advantage when the timber is not perfectly seasoned.

DOG CART. This is a high, open, two-wheeled vehicle drawn by one horse. It has two seats, placed back to back and each holding two persons. The rear seat usually folds up, and the back footboard can be fixed up so as to enclose the body of the vehicle. This type of carriage is very suitable for persons who wish to get about the roads quickly. *See* Carriage; Driving.

DOG FISH. Belonging to the species of smaller sharks found off the British Isles, the dog fish is so named from its habit of pursuing in packs the smaller fish on which it feeds. It is dreaded by fishermen, the value of whose catch is frequently seriously diminished

owing to the dog fish biting at the fish hanging on the line and attacking and damaging the nets.

DOG'S TOOTH VIOLET (Erythronium). These are beautiful little spring-flowering bulbs suitable for planting in the rock garden. They thrive best in peaty or leafy soil in slight shade. The popular name is derived from the shape of the bulb which bears some resemblance to a dog's tooth. The flowers of the common kind (dens-canis) are of various colours, rose, purplish-pink, etc.; they are on stems 6 inches or so high. The American Dog's Tooth violets, which need a sunnier place, are finer and more varied in colour. Some of the best are Hendersonii, pale purple; revolutum, purplish pink, and Hartwegii, yellow. The bulbs ought to be planted in September or October about 2 inches deep.



Dog's Tooth Violet. Clump of flowering plants of the European species, dens-canis.

DOGWOOD (Cornus). These are hardy shrubs or small trees which are valued for their flowers, ornamental leaves or coloured bark. The commonest of the flowering kinds is the cornel or Cornelian cherry (cornus mas) which grows wild in Britain: it makes a big bush and bears a profusion of small yellow flowers in February-March. Cornus Nuttallii, which bears large white flower-like bracts and autumn-tinted leaves, is very beautiful, but, being less hardy than some others it needs a sheltered position. Florida, macrophylla and kousa are others which produce attractive, pale, flower-like bracts. They need a sunny sheltered spot.

Of the dogwoods, grown for the sake of their coloured leaves, the two finest are Cornus alba Spaethii with green and yellow, and alba variegata with green and white leaves. Cornus alba and stolonifera have red stems, those of flamiramea are yellow. These, which are beautiful in winter, should be hard pruned annually in March for the bark of the new shoots is more brightly coloured than that of the old stems. Propagation is by layers in summer or by cuttings inserted out of doors in autumn.

DOILY. Doilies may be round or square, and are made for dessert use of real lace, Irish crochet, hand-painted gauze, oriental embroidery on muslin or silk. Lace paper doilies can be bought in varying sizes in silver and gold paper as well as in white. Their use should not be overdone. For cake plates they are not necessary, but they are a good finishing touch for serving small savouries, sandwiches and pastries. *See* Luncheon Set.

DOLLS AND THEIR HOMES

With Details for Making these Fascinating Playthings

This article describes how to make a simple doll, a doll's house and also its furniture. For other information of a similar kind see Christmas; Knitted Toys also Toys and Toymaking.

While freakish dolls, sophisticated dolls in fancy dress and purposeful dolls, whose wired crinolines conceal a telephone or a bottle, are a matter of passing fashion for the grown up, the real toy doll retains a permanent position as a nursery favourite. It may be of rubber or wood, or soft and cuddly of the knitted wool or plush-covered variety; it may be made completely of wax, china or composition or have its face, arms and legs of one of these fabrics and the rest of its body of linen stuffed with horsehair or other material; it may possess an automatic equipment for walking and speaking, a wig of real hair and almost deceptive eyebrows, eyelashes and teeth, or it may be merely a sixpenny doll with no merit but the one common to any of the others, its capability of becoming the intimate friend of its possessor.

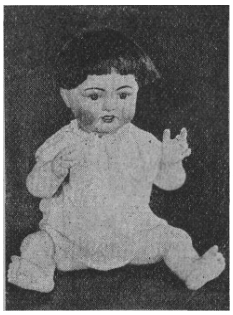
When grown beyond the stage of her first cuddly toys, a little girl is normally attracted by a doll dressed more or less as herself; small boys quite often like dolls dressed as soldiers, sailors, or Red Indians. It is certain that many girls who love their dolls do not want to bother about dressing or undressing them, but young children of both sexes will frequently be interested for hours playing with a doll's house and its furniture.

Easily Made Dolls. Printed covers for rag dolls, ready to be cut out, made up and stuffed can be bought at many toy stores. Having laid such a cover flat on the table, with sharp scissors cut round the outline, leaving a narrow margin for making up. This is turned in and if the seams are neatly oversewn on the right side stuffing can be done as the sewing proceeds. Kapok (vegetable down) is the best filling to use and should be well worked into the cover.

Another method, which can be used when an old bought stuffed doll is available, is to unpick the doll, remove the stuffing, iron the case to smooth out creases, and take the pattern of the old doll. It may not be necessary to go to the trouble of unpicking it, for if the shape is simple the pattern can be obtained by measurement. The old stuffing, provided it is quite clean, can be used to fill the new doll. The accompanying diagrams give ideas which can be supplemented by individual taste.

Fig. 1 shows how to cut out and place pattern on material to make a doll. For one of medium size the

distance from shoulder to knee should measure 10 in., and across hips 4 in. The leg and foot are cut in a separate piece, also the arm (A, C, and B). For making the body-case, holland, glazed linen, or wash-leather are suitable. When the pattern is cut out place back and front together, right side inside, and stitch all round, leaving ¼ in. turnings. Leave the neck open for stuffing.

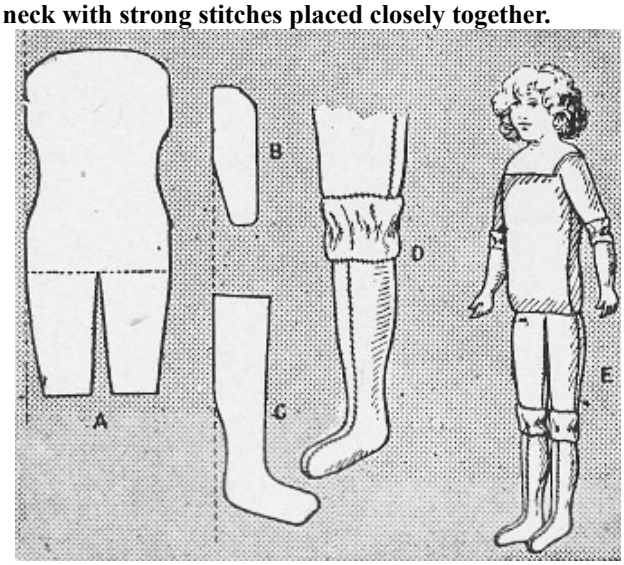




Doll. Left, composition doll with bobbed hair. Right, jointed doll with eyes that open and close (Selfridge & Co., Ltd.)

There are many different materials besides kapok that are suitable for stuffing dolls. Brown rugging wool, provided it is clean, is a cheap and soft filling. Flock is another material which can be used. Sawdust and bran give a good shape to the doll when filled. Before using, care must be taken that the tilling is dry; this especially applies to bran, which, if packed damp, soon goes mouldy and smells unpleasant. Fine wood wool is much employed for stuffing dolls, and is suitable for big ones that will be subjected to hard wear. This can be bought at glass and china shops.

Whatever filling is used, it must be packed in tightly. Force it well down into the legs, using a pencil. When both legs are well filled and a good shape, machine or stitch by hand a straight line across the body; this forms the hip line (Fig. 1). Continue to fill in the same way until the trunk is firm and a good shape. Close the neck with strong stitches placed closely together.



Doll. Fig. 1. Stuffed doll, showing how to cut out the various pieces. The method of making a movable joint is shown at D.

The lower leg and foot should next be made. When filled the leg is ready to attach to knee. The following contrivance, which is extremely simple, makes the knee move as though jointed (Fig. 1, D). Do not attach the lower leg directly to the upper leg, but instead stitch on a piece of the same material, 1½ in. deep, from which the body was made around the bottom of the upper leg. Sew the top of the lower leg to the outer edge of this band of material. This leaves about ¾ in. between the two limbs, and will allow for movement sideways as well as backwards and forwards. The arms can be entirely made of material, or the lower arm, wrist, and hand can be bought made in composition or plaster, and glued to the upper arm. Attach both arms to the neck.

As this particular doll is intended to be for older children who would appreciate a realistic one, it is better to buy a head, obtainable at toy shops at varied prices. The heads are provided with good shoulder pieces, which must be glued over the top of trunk and arms, thus doing away with any unsightliness where the arms join the body.

Clothing for the Dolls. Clothes for dolls may be copied from national or fancy dresses, but are more often merely reproductions on a small scale of those made for girls, babies, and, to a lesser extent, boys. Their making is therefore only an adaptation of the ordinary principles of dressmaking, knitting, etc. Usually the more nearly the doll's clothes resemble those of its prospective owner the greater pleasure will it give; and for some children the larger its wardrobe, the greater amount of interesting occupation it will supply.

Socks can be made on fine needles, just a straight strip decreasing a little towards the end; when sewn together at the back, and pulled on to the doll's leg, they will shape themselves. Shoes may be made from old gloves and fastened on with a button and loop. A vest can be knitted or crocheted. A straight piece of knitting with stitches cast off in the centre for the neck and shoulders and picked up again to complete the back is all that is necessary. A crocheted border for the neck will allow of a ribbon or string to pull it up.

Patterns of dolls' clothes, together with detailed instructions for cutting out, etc., are sometimes issued with fashion periodicals, while various books and papers dealing almost exclusively with clothing for dolls and everything pertaining to the toy are obtainable.

Dolls tor Christmas trees, party favours, etc., can be dressed in crepe paper. This can be bought from most toy stores in rolls of various sizes and in a wide range of colours. A combination of different shades is often successful.

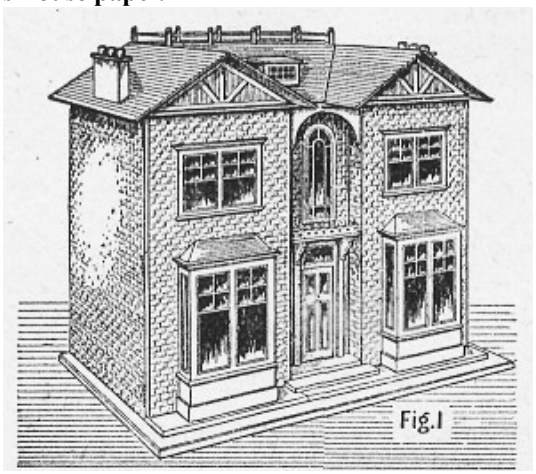
Because of its fragile nature, crêpe paper should be sewn with care and a fine needle used. This precaution applies particularly to gathers where the thread has to be drawn up very gently.

Renovations and Repairs. There are certain doll's hospitals in London and the provinces to which a

damaged doll can be sent for repair. New wigs can be supplied quite inexpensively, new limbs, new eyes, and new heads. The body of a large well-made doll will stand two or even three decapitations, and be worth re-heading at intervals. It is quite possible to repair a broken doll at home provided the face is not cracked and ruined. Very often the back of the head gets crushed in. The best remedy is to stuff the head with paper or cotton wool and glue over the whole aperture a fairly large wig. The jointed limbs of dolls can often be fixed in again. In the case of a hair, wool or sawdust stuffed doll, the detached limb can be sewn on again securely.

If the body is of celluloid or composition the limb can be securely tied on with strong thread or very fine elastic. The latter is knotted through one limb, threaded through a coarse darner, and then drawn through the doll's body, and the limb on the other side attached. If the outer covering of the hair or wool or sawdust stuffed body becomes torn, a neat patch sewn over the hole prevents the doll from "bleeding to death." In the case of a cracked face, the only remedy is to melt a little wax from a candle and pour it into the crack, smoothing it first before it sets to make it look as even as possible.

The Doll's House. An inexpensive, quickly made, strong and attractive doll's house is shown at Fig. 1. Oddments and three-ply board are almost wholly employed in the construction of these houses, the whole nailed together, and the walls and roof covered with doll's-house paper.

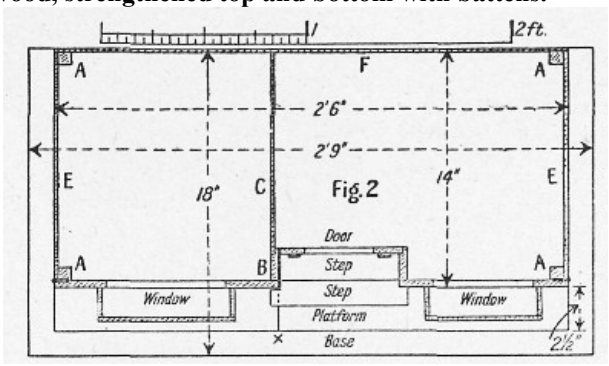


Doll's House. Fig. 1. Easily constructed doll's house.

The entire front is constructed as two large doors which open over the ends and disclose the whole interior with four roomy compartments. On the ground floor is a kitchen at the left, and at the right a lounge living-room. The first floor may be used for two bedrooms; or the right-hand half may have a partition across, making space for a bathroom. In the lower lounge there is room for a neat staircase The roof is so built that it may be lifted off; elevations and plans shown are drawn to scale. The elevations and plan at Figs. 2, 3, and 4 will give sizes and quantity of timber. Fig. 6 shows how the skeleton framework is built. There are four corner posts (A), for which lengths of about 2 ft. by ¾ in. square will be wanted. The middle upright (B) is the same length, but 2 in. wide by ½ in. thick, and is rebated for the partition (C), which will be 3-ply board. The bottom (D), ends (E), and back (F) are three-ply, nailed on. The top (not shown in this sketch) is also 3-ply, the same size as the bottom.

The 3-ply floors (G) are cut at the corners to fit the posts, and fixed to narrow mould nailed to the 3-ply sides and partition. The right-hand floor (G) should be cut back in the middle as indicated to allow for the recessed doorway part.

The front is a pair of large doors, hinged to the posts (A), and opening from bottom to top. The left-hand door, 13 in. wide, shuts on the upright (B), which is a fixture. The right-hand door is 17 in. wide, and includes the recessed doorway portion of the house Thus, the right-hand opening front is not flat, but has a break (Fig. 8). The fronts of the house may be of ⅜ in. wood, strengthened top and bottom with battens.



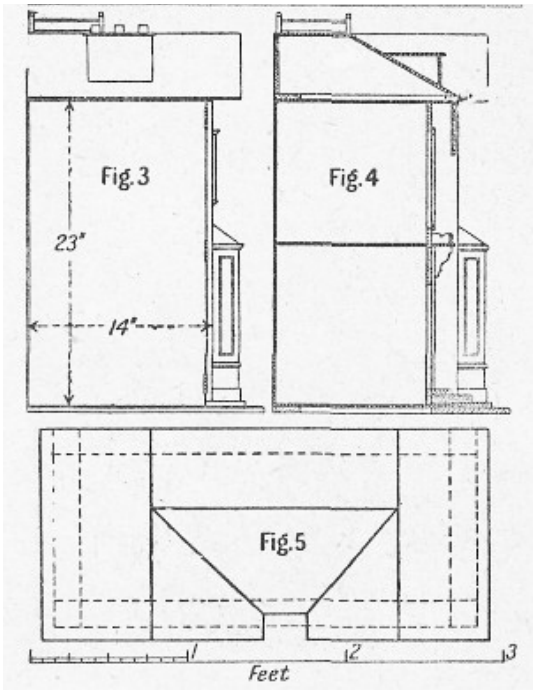
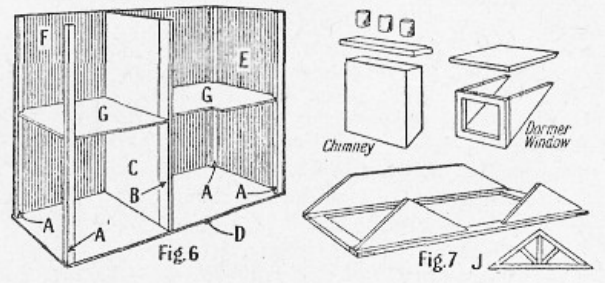


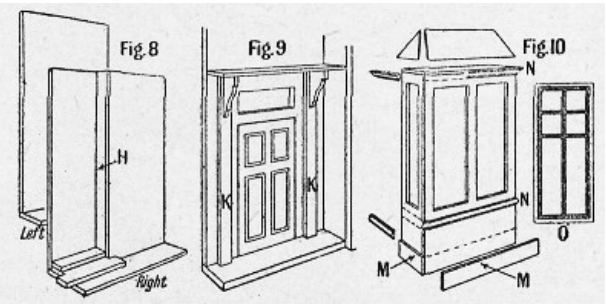
Fig. 2. Plan. Figs. 3-5. End and sectional elevations and plan of roof.

Screwed to the underside of each opening front is a ½ in. platform which carries the bay windows. This platform is 30 in. long by 3 in. wide; but, as it opens out

with the doors, it must be cut across as at X on plan (Fig. 2). At Fig. 8 are given outline perspective sketches of the left and right opening fronts as they will appear in carcass. The bay windows and doorway are not shown on this sketch. The narrow break piece (H) should be of ⅜ in. wood, nailed to the main parts of the little building.



Figs. 6-7. Carcass of house and details of roof.



Figs. 8-10. Opening fronts, doorway and bay window.

Each door should be hinged with three good butts, and the platforms should be raised about ⅛ in. from the base. The base of the house may be framed up of ½ in. or ¾ in. material, halved at the corners. The front stile will be 6 in. wide: the back stile and rails may be 2 in. A stiffening centre rail 2 in. wide should be added.

How to Make the Roof.

A scale plan of the roof is given at Fig. 5, and at Fig. 7 a simple method of its construction. First make a frame of ½ in. material, 32 in. by 15 in., to overhang 1 in. at front and sides, but flush at the back, halved at the corners, with four holes bored to enter dowels fixed in the top. From Fig. 7 it will be seen that two gable pediments and a back piece (all of ⅜ in. material) are nailed to the frame. Over these the 3-ply roof may be laid.

The shapes of the three inner slopes should be cut in stiff paper to secure the correct angles The flat back portion of roof is approximately 18 in. by 6 in., and will take a balcony rail. The front gables may be overlaid with ⅛ in. fretwood cut to a width of ½ in. The arrangement of the strips is shown at J, Fig. 7.

The doorway has two steps, ⅜ in. or ½ in., the lower one cut back close on the left-hand hinged front (Figs. 2 and 8). The door pilasters, (K, Fig. 9), of ¼ in. fretwood, 10 ¾ in. long by ¾ in. wide, are sur-mounted by a ledge supported by two shaped brackets. The ledge may have an ornamental rail as shown in Fig. 1. The door may be 8 in. by 4 in. with 1/16 in. veneer mounted on to form panels. The fanlight above will be treated as a window. The arch shown above the doorway should be of ¼ in. or ⅜ in., set back about ¼ in. from face of the house front. As the arch opens with the right-hand house front, it must be made rigid at the left-hand side by glueing in a small piece of wood to secure it in the recess. If preferred, the lower step may be out flush with the upper one, so that the left-hand door may be made to open before the right-hand one.

Fig. 10 shows the bay windows, of ¼ in. material with three-ply roofs, the plinth (M). and moulds (N) being glued on. The upper windows are made up of 3/16 in. fretwood glued on in strips. Narrow moulds are planted on above and below. All windows should be glazed, the glass being beaded in. To secure the effect of sashes, strips of narrow veneer may be glued to the glass as at O, Fig. 10. The construction of the little dormer window, shown at Fig. 7, calls for no comment. The chimney stack (Fig. 7) is a block of whitewood 5 in. wide, 3½ in. high and 1 ¼ in. thick. Above is a flat piece of ¼ in. fretwood, and three short lengths of 1 in. dowel rod will serve as chimney pots. For the top balustrade the posts may be ⅜ in. square by 1 ½ in. high. Between these, on the roof floor, are glued strips of fretwood ⅜ in. wide, whilst the rail itself may be ¼ in. beech dowel rod with little turned balls on the post tops.

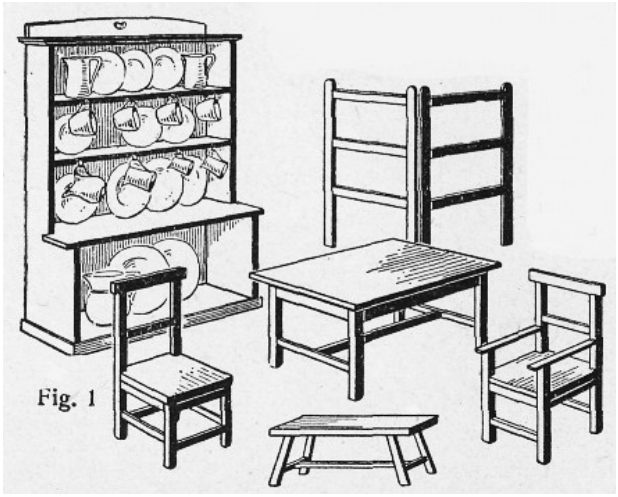
A special feature should always be made of the outside and interior decoration of a doll's house, for it is this touch of reality that appeals to the child. The exposed woodwork may be painted a soft cream, the stand green, and the chimney pots red. The outside walls should be covered with doll's house redbrick paper, and the roof with blue tile paper. For the inside a great variety of miniature patterns is available.

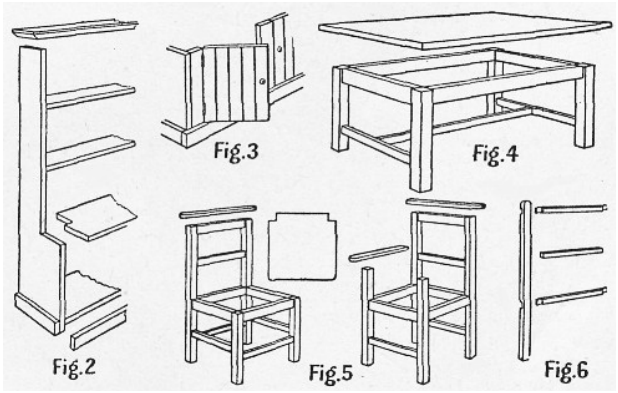
The Furniture. If the floors have been smoothly planed, they can be stained, but if rough, it is better to carpet them all over, cutting the carpets from any odd pieces. The floor of kitchen and bathroom can be covered with linoleum, and little rugs can be made of tiny pieces of carpet in contrasting colours. Long side curtains of cretonne or casement cloth surmounted by a little frill in the same material across the top of the windows look well. Little net or muslin half curtains can be placed across the lowest sashes.

Charming little beds can be made out of notepaper boxes, chocolate boxes, etc., arranged so that the lid of the box forms the head of the bed, and trimmed with a frill of muslin to form valances and curtain. Mattresses and pillows stuffed with cotton, wool, and calico sheets, are added. The bed curtains in the different rooms can be tied with different coloured ribbons and the coverlets made of ribbon to match. An eiderdown can be made by stitching up about 12 in. of 5 or 6 in. wide satin ribbon to form a bag, stuffed with a layer of wadding. The bag is then sewn up, and the rows of stitching added by machine, which produce a facsimile of an eiderdown quilt.

The kitchen equipment should include a stove, pots

and pans, wash-tub, mangle, irons, and all the usual outfit. Tiny brooms can be made by tying a few wisps of fibre to a thin skewer or a few little feathers to a matchstick. A set of kitchen towels, dusters, etc., can be made, and, of course, the usual complement of cups, saucers, plates, etc., obtained. Sets made of aluminium are quite inexpensive, and minute cutlery, spoons, forks, etc., are obtainable in tin.





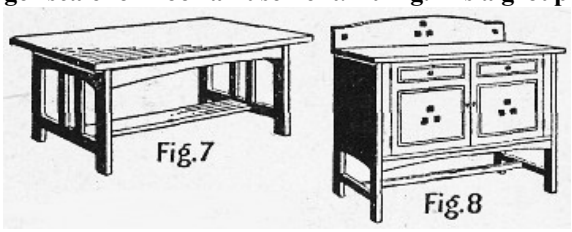
Doll's Furniture. Fig. 1. Complete set of kitchen furniture. Fig. 3-6 Diagrams showing how to make the various pieces.

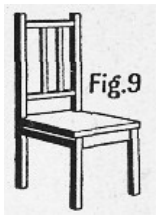
Furniture Designed for the House.

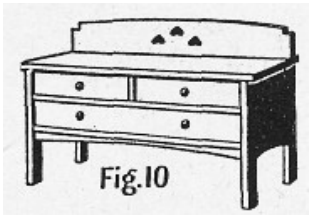
Doll's furniture may roughly be divided into two classes. There is the miniature furniture that a child can use with her dolls on the nursery floor—chairs, tables, beds, etc., made on a scale proportionable to the size of an average doll. Then there is the toy furniture used to decorate the doll's house, and it is to this latter type that the accompanying illustrated suggestions chiefly apply. Almost all the designs shown, however, have been so prepared that they can be made to any size—in miniature form for the doll's house, or to toy items for the kitchen. Constructional details are shown

in conjunction with a tub. The peg dolly consists of a vertical rod forming the handle; the lower end carries a disk on which are mounted a number of wooden pegs. The clothes are washed by using the dolly to propel the clothes, employing an undulating and rotary movement for this purpose. at Figs. 2—6.

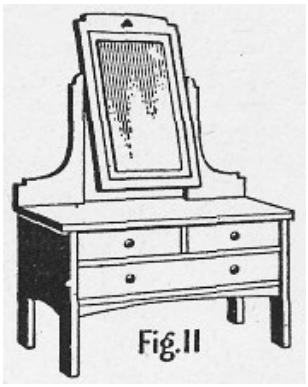
Miniature dining room and bedroom furniture is shown in Figs. 7-13. Hints for other items may be gathered from our furniture articles on other pages of this work. For the smaller toy furniture odd scraps of fretwood (¼ in., 3/16 in. and ⅛ in.) will be serviceable. larger scale for floor amusement. At Fig. 1 is a group of







Doll's Furniture. Fig. 7. Dining table. Fig. 8. Sideboard. Fig. 9. Dining-room chair. Fig. 10. Washstand. Fig. 11. Dressing-table.



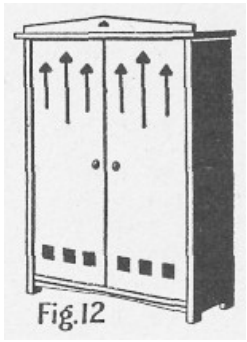


Fig. 12. Wardrobe.

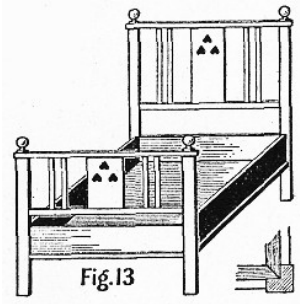
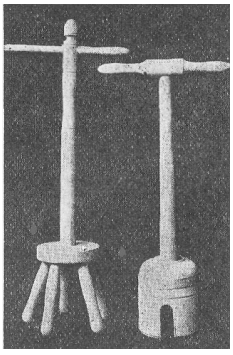


Fig. 13. Bedstead.



Dolly. Left, peg; and right, chump. (Courtesy of T.Bradford & Co., Ltd)

DOLLY. A dolly is employed for washing clothes clothes in conjunction with a tub. The peg dolly consists of a vertical rod forming the handle; the lower end carries a disk on which are mounted a number of wooden pegs. The clothes are washed by using the dolly to propel the clothes, employing an undulating and rotary movement for this purpose.

The chump dolly has the pegs formed by shaping them from the

solid, and are considered stronger, as there are no separate parts to work loose. Many of the hand and power driven domestic washing machines consist essentially of the washing tub and a dolly that is mechanically actuated, as by turning a handle or pushing a lever. *See* Laundry.

DOMETT. A cotton imitation flannel, unbleached or white, twill-woven and with a fleecy nap on both face and back, domett corresponds closely to flannelette (q.v.) and serves the same purposes.

DOMICILE. A man's domicile is the place where he actually lives with the intention of making it his home. It is quite different from his nationality. The intention is very important, because many people live in a country for a very long time without any intention of making it their home. Thus British members of the Indian Civil Service do not lose their English or Scottish or North-Irish domicile by any number of years residence in India, because it is presumed that on the expiration of their service they intend to come back to the country they always call home.

But mere intention without the fact of residence will not do. Thus if I, who was born and have always lived in England, make up my mind to go and live in Scotland, but do not go—postponing my departure from time to time—my intention does not make me a domiciled Scot.

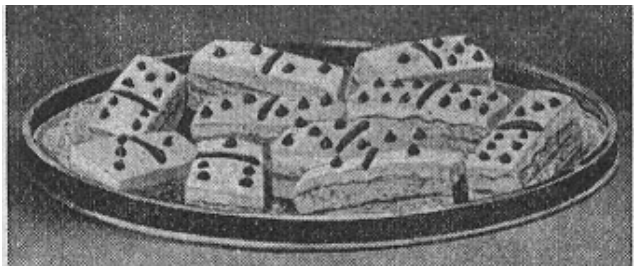
Until attaining 21, a person's domicile is that of his father. The domicile of origin is retained until another is acquired, either by the person when over 21 going to live in another country with the intention of making it his home, or, in the case of a female, by marriage with a man of another domicile.

Domicile regulates a person's matrimonial status and the disposition of his personal property, wherever situate, on his death. Thus, personal property in England of a person domiciled in Scotland must be disposed of by Scots law. A will should be made according to the law of the testator's domicile, and if it be good according to that law it will be recognized by British courts.

Any person seeking divorce must apply to the courts of the country of his domicile, and if he obtains a divorce elsewhere the British courts will not recognize it, and will send him to prison for bigamy if he marries again. In England and Scotland a marriage contracted according to the law of either country is legal; but British girls marrying foreigners should be very careful to ascertain that the marriage will be lawful according to the law of the husband's own country. *See* Naturalization.

DOMINO. A domino is a kind of loose cloak with wide sleeves and a hood, worn at masquerades by men and women who are not personating a character. A small mask, generally covering the upper part of the face only, is worn with a domino. Dominoes are made in a variety of colours and in any suitable material. Taffeta, satin, Italian cloth or sateen are the materials most frequently used. *See* Fancy Dress.

DOMINO CAKES. Cut some Genoese pastry into small rectangles, split them lengthways, and spread the insides with raspberry jam. Coat the little sandwiches with royal icing, and when set decorate them to resemble dominoes. This may be done with the aid of a forcing pipe and a little chocolate icing. Almost any kind of cake, preferably white, can be used for making these sweet cakes. *See* Genoese Pastry; Icing.



Domino Cakes, consisting of raspberry sandwich decorated with royal icing and chocolate pips.

DOMINOES: How to Play. There are many variants of this popular game. It is played with 28 oblong pieces, usually made of ivory or bone, as far as the fronts are concerned, and of ebony or a substitute for the back. They are made sometimes in wood or in cardboard. The face of each domino is divided into two equal squares by a black line, and each square, save a few that are blank, is marked with black pips, varying in number from one to six. A set consists of pieces marked as follows:

0.0	3.1	4.4	6.0
1.0	3.2	5.0	6.1
1.1	3.3	5.1	6.2
2.0	4.0	5.2	6.3
2.1	4.1	5.3	6.4
2.2	4.2	5.4	6.5
3.0	4.3	5.5	6.6

There are in existence many sets of 55 pieces which are numbered up to 9.9, and others of 91 pieces go up to 12.12, but an ordinary set does not go beyond 6.6.

The block game, which is one of the commonest domino games, is played as follows, usually by two persons, although more can play. Shuffle the dominoes face downwards and then let the players draw for the lead, unless, as is frequently done, the one holding double six or the highest piece in play takes it. This decided, the leader takes the number of dominoes agreed upon, and his opponent follows his example. They look at these dominoes themselves, but must keep from the view of the other player.

The leader then places a domino on the table, and the other player must fit to one of its ends one having the same number of pips as are at that end, e.g. 3 must be fitted to 3. If the player plays double 3 or any other doublet, which is placed crosswise, he is allowed another turn, while if he cannot fit a domino he loses

his turn. Conditions are the same if three or four people play.

A variant of the game is to leave a certain number of dominoes, generally 14, in the pool or centre of the table. These are drawn upon by a player who cannot fit one from his own hand. As he draws when they are face downwards, if he draws one that is unsuitable he increases his holding and thus suffers a disadvantage. The pool is not drawn upon after only two dominoes remain in it. A game is usually for 100 points, these being made by the winner of each round counting the pips that remain in his opponent's hand or hands.

Matador. Another popular domino game is called matador. In this, instead of fitting the dominoes with ends like to like, e.g. 4 to 4, each player in turn must fit one to make up a total of 7. Thus, if the line of dominoes on the table have 2 and 4 at the ends, he can play one having 5 or one having 3, or he can play a matador, as four of the dominoes are called. These are double blank, and three that total seven, 6.1, 5.2 and 4.3. If he cannot play he must draw from the pool, losing his turn if he cannot find one suitable. If a domino having one end blank is played, no dominoes can be fitted to it, except one of the four matadors. When no further play is possible the winner, i.e. the player who has the fewest pips on his remaining dominoes, scores the number held by his opponent or opponents.

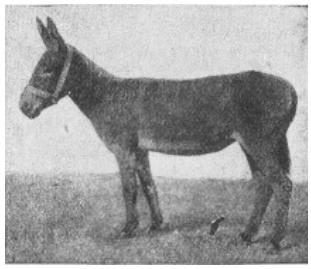
Other Games. Two other games are known as All Fives and All Threes. In the former two, three or four players can take part. Each takes an equal number of dominoes, provided that at least two remain untaken and that no one has more than seven. They are shuffled and distributed with the faces downwards. The object of the players is to make the two end pieces five or a multiple of five when the pips are added together. All double dominoes must be placed transversely.

All Threes is a variant of All Fives, the essential point being that three and its multiples score instead of five and its multiples. The scoring numbers are therefore three, six, nine, 12, 15, and 18, which score respectively one, two, three, four, five and six. The game is usually played for 61 points.

Another game is known as fortress. Four players take part, each having seven dominoes. The one holding double six leads and the others must play to it, as in the ordinary game, until they can go on no longer. The game owes its name to the fact that the players have the right of placing the dominoes at right angles to those already down, as well as in line with them, thus forming them into a fortress-like plan.

DONKEY. For people of modest means or for teaching children the rudiments of horsemanship the donkey is very useful. Costing not more than a few pounds to buy, his yearly keep is equally inexpensive, especially if there is a paddock in which he can run. He is hardy, docile, sure-footed, and seldom is ailing. He measures generally well under 12 hands. If one is bought young, treated in a kindly manner, and given a little corn and hay, he should be able to trot well, and grow up free from the stubbornness so characteristic of the race. Ladies living in the country find an animal of this description most useful for conveying luggage, etc., to and from the station. A light village cart is the most suitable and brown harness looks the best.

In choosing an animal select one of the dark-coloured sort with fine, clean legs. They are said to be preferable to the lighter. If kept out at grass all the year round they cannot be expected to do as much work, or trot as quickly, as if they are fed more like a horse. Children may begin to ride a donkey in panniers as soon as they can sit up, later on coming to a saddle. When old enough they should be encouraged to ride bare-backed.



Donkey. Useful animal for teaching the elements of horsemanship to young children.

DOORS: MAKING NEW & IMPROVING OLD ONES

Styles and Methods of Work Explained and Illustrated

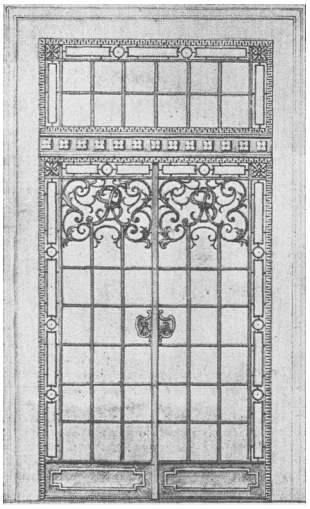
Among the many headings in this work that contain information on doors are Adam Style; Architecture; Cottage; House. See also Amateur Carpentry; Architrave; Bolt; Bracing; Burglar Alarm.

After the solidly plain doors surmounted by the beautiful arch of Tudor times, Jacobean doors were elaborately panelled, but towards the end of the 17th century panelling became simpler, doors often showing only two panels each. In the 18th century, however, there were usually six panels or more, but the mouldings retained simplicity. At the end of the century Robert Adam fully appreciated the decorative importance of beautiful doors and designed doors and architraves enriched with fine mouldings and carvings to suit the style of his buildings. Unfortunately a great many ugly doors were constructed during the 19th century.

While the doors of the modern house are usually designed by the architect to suit the character of the building, whether modern or influenced by Tudor, Jacobean, Queen Anne or Adam style, much may be done to improve the appearance of existing doors when reconstructing or redecorating the house. Front doors should never look shabby. This is not likely to happen when the door is of mahogany or matured oak and only needs the ordinary care given to such woodwork and the regular cleaning of the door furniture. It does, however, happen in the case of painted hall doors which have been allowed to remain dusty, dirty, splashed or blistered owing to neglect, wet weather or lack of a sun curtain.

Though bright colours for doors in a town street or

terrace are attractive, it is well to remember that they will not continue to be so unless paint with a very hard, glossy surface to withstand the weather is used. Black or dark blue gives a door a dignified appearance, but any dark colour is apt to show dust collected in the panels unless carefully kept. Green is an excellent front door colour, the colder greens such as malachite or jade being good with wrought-iron door furniture for a terrace door, while the warm leaf greens form a pleasant contrast to a red brick house and harmonize with any surrounding trees.



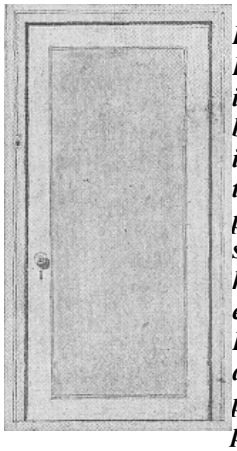
Door. Iron door with hammered enrichments suitable for the inner hall door of a large house. (Courtesy of Bayliss, Jones & Bayliss. Ltd.)

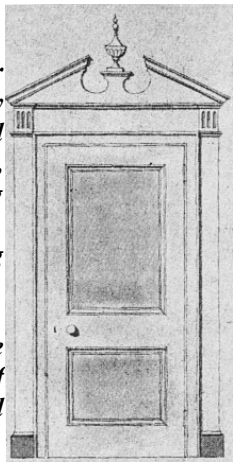
This illustration shows a good design for the inner hall door of a large house. It is of hammered iron, panelled with glass.

Improving Ugly Doors. Inside many houses badly made and badly proportioned doors have to be endured or camouflaged. Such a door may be rendered unobtrusive by painting it the same colour as the walls and placing a draught screen so that it is partially hidden, but apart from this expedient there are small improvements which can be made without much expense or trouble. Where panels are shallow, strips of narrow picture moulding, sold by the foot, can be applied all round inside the panels. The strips are held in place by tiny pins, and may be painted before applying if the door has already been repainted. A good idea is to use a different colour for the moulding, contrasting with the door and matching the frame, or the mouldings may be painted in gold or silver metallic paint, the panels in a deeper shade of the door colour and the metallic paint used to outline the frame. Such details necessarily depend on the decorative scheme of the particular room.

An insignificant door in a room of fair height can be remedied, as shown above on the right, by the use of a plywood pediment and pilasters made of thin boards. This treatment would be particularly suitable for a room with decoration and furniture based on an 18th century style. Applied mouldings are used to border the pediment and to ornament the pilasters, picked out with a contrasting colour.

Another improvement which can be carried out is also illustrated. The door is cased in plywood and is thus made panelless and flush. This treatment is suitable when a brilliant enamelled surface is given to the plywood and a rich colour is used, the architrave of the door being in a paler shade which matches the skirting and cornice of the room. Coloured glass or painted china door furniture to tone make such a door highly decorative.





Door. Left, door improved by being encased in plywood, the resulting panelless surface being highly enamelled. Right, the addition of pediment and pilasters transforms an insignificant door.

Defects and Remedies. The practical test of a good door is that it opens and shuts easily; inferior doors tend to drop and drag, being susceptible to damp. Unsatisfactory working of a door is nearly always the result of swelling, warping or other such change in the wood. A common trouble is sticking when shut. Passing a piece of paper all along the crack between the top of the closed door and the lintel, and between the edge of the door and the jamb, working from inside the room, will reveal the region of contact by the fact that the paper cannot be passed along the crack there. The door can be kept open by a wedge inserted under the bottom, while the high place is planed down. To plane the bottom the door must be taken down and then rehung.

Sticking can be cured without planing if there is a good wide crack between the door and the jamb on the hinge side when the door is shut. If the sticking region is located between the door and the jamb towards the top, or if it is between the bottom of the door and the floor or carpet, the door should be taken down, the recess in the jamb which receives the top hinge should be cut deeper with a chisel, and the door replaced. If the tight place is over the top of the door, or if it is between the door and the jamb towards the bottom, the same procedure is to be followed, except that in this case it is the bottom hinge, not the top one, that is to be sunk further into the jamb.

A door that will not stay shut or that has to be forced to make it latch or that cannot be locked, can usually be cured by moving the perforated plate which is provided on the jamb to receive the latch and bolt. If the latch works correctly when the door is forced home in shutting it, then the plate should be moved a little outwards towards the room. If latching is facilitated by lifting on the door handle, the plate requires lowering, while if pressing down on the handle makes the latch work, then the plate must be raised. In bad cases all three tests will fail, and it is necessary to resort to measurement. The door should be nearly shut so that the height at which the latch meets the plate can be marked. Then on opening the door the worker will be

able to see at a glance whether the plate needs raising or lowering.

If the height proves correct, then what is required is to move the plate out towards the room, the exact amount being found by shutting the door and measuring the position of the latch by inserting a knife-blade in the crack, this measurement being compared with the position of the holes in the plate on opening the door. The plate is moved as required by unscrewing and removing it and then cutting an extension of the recess it has occupied in the jamb. The deep holes in the jamb which admit the latch and bolt will probably require extending, an operation which demands care, and the old screw holes must have plugs of wood hammered in and cut off flush before the new screw holes are made.

The latch trouble may be due to an entirely different cause from the above, i.e. a broken spring or excessive friction in the lock; the test is to see if the latch springs out freely when the handle is turned and released with the door open. If this test shows that the mechanical action is at fault, the lock should be taken off the door by removing first the screw securing the handle to its square bar, then the handle, then the bar, then the screws which hold the lock in place in or on the door, and finally the lock itself.

When a door yields at the joints, take it down, drill out any dowels, and take the door to pieces. Then refit all the joints, glue and wedge it up as if it were a new door, using new wedges in place of the old ones. If a proper clamp is not available the door can be assembled and glued up, all wedges driven in tight and flush, and the door placed in the frame. The door is fixed in the frame first of all without the hinges. Thin wedges are then driven in between the door and the frame and the whole left to set hard. The joints can be repinned while in this position to ensure a permanent tight fit.

When setting out a door, it should be made to fit tightly to the inside of the casing to allow for any necessary truing and cleaning up. It will be noticed that the casing is rebated, as in Fig. 13, so that the sizes will be taken from the rebate.

If a door is to be made for use in an old building, it is always advisable to ascertain if the existing casing is square, and to make any necessary allowance in size if it is not. Clearance must also be carefully allowed for the carpet.

The height, width, and thickness depend upon the casing, but the measurements of the various parts may be taken from the illustrations as a guide and varied to suit any particular design, provided that strength and durability are always evident.

Ledged and Braced Door. Fig. 1 is sometimes handy for a cellar door or for temporary use. The battens, of such a width that together they make up the exact size required are 1 in. thick, tongued and grooved together. The tongue of the one outside batten and the groove of the other batten will both be removed.

First cut off all the battens slightly longer than the finished length, select one for the outside and mark the position of the ledges, which should be in section as in Fig. 2. Nail these on firmly at right angles and place the remaining boards in position and cramp them together. Next turn the door right over and drive the nails of the remaining battens through into the ledges, the outside battens being screwed to prevent them from curling off. The braces, which are the same width and thickness as the ledges, are fixed as in Fig. 1, the ledges being cut away to take them. The lower ends of the braces are at the hinging edge of the door. Fig. 3 shows an alternative section for the ledges. Cross-garnet hinges should be used for this style of door. An ordinary latch or rim lock will be quite sufficient for fastening purposes in the ordinary way.

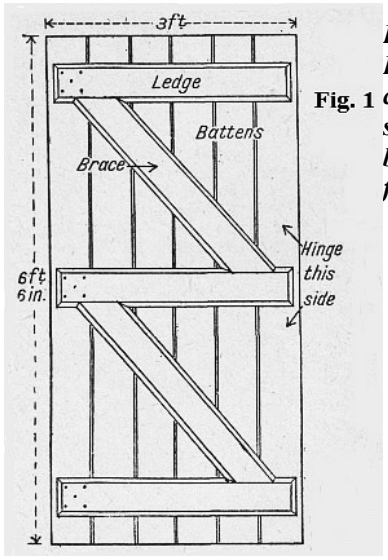


Fig. 1 *Door. Figs. 1-3. Diagrams showing construction of a simple ledged and braced door suitable for a cellar or shed.*

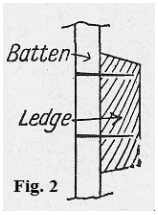


Fig. 2

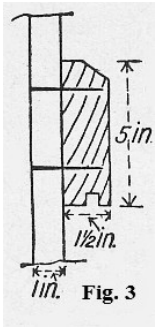


Fig. 3

Fig. 4 is a plain, panelled door, suitable for a kitchen. The stiles are first prepared from 1½ in. deal about 2 in. longer than required, and the position of the mortises marked out on both edges, extra allowance being made on the outside edges for the wedges. The mortises will not occupy the full width of the rails, but only commence in a line with the panel groove, the usual depth for which is 7/16 in. (Fig. 6).

All the rails are then marked out, also the centre upright or muntin, the shoulders for which are marked from the stiles. When cutting the tenons of the top and bottom rails, allow haunches at the outside edges to fit into the panel groove (Fig. 6).

All the rails are then marked out, also the centre upright or muntin, the shoulders for which are marked from the stiles. When cutting the tenons of the top and bottom rails, allow haunches at the outside edges to fit into the panel groove (Fig. 6).

Having cut all mortises and tenons, the panel groove may be ploughed. For the panels use ½ in, deal, cutting them ½ in. short in length and breadth for clearance (Fig. 5). All the joints should now be fitted and the door assembled, commencing with the centre upright and the top and lock rails. Place the two top panels in position and fit all the rails into one stile and fit the

bottom panel, finally knocking on the other side. Now carefully test to see that the door does not wind. When glueing the job together, knock the stiles partly off, glue the tenons and knock together again and cramp up, knocking the wedges in lastly.

Avoid getting any glue on the panels, as they must be quite free in the grooves. When dry, level off the joints and smooth with glass-paper. This particular door is hinged with 3 in. or 3 ½ in. iron butts let in in the usual way, and a rim lock fitted as shown in Fig. 4.

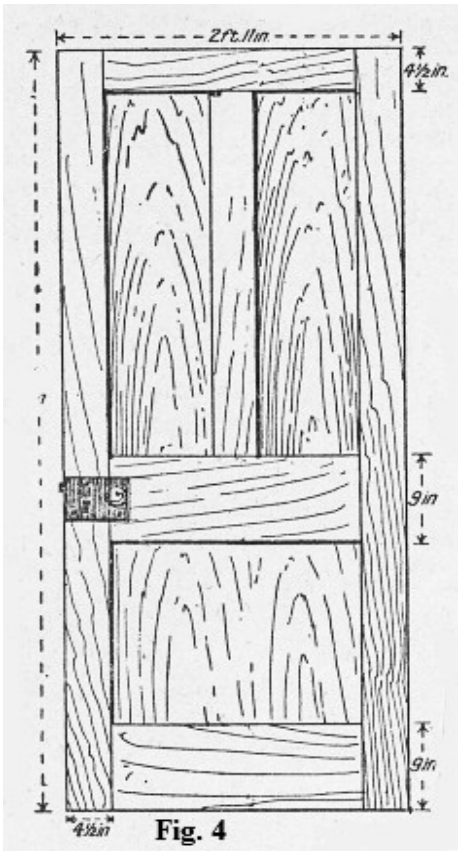


Fig. 4

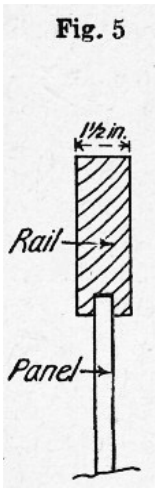
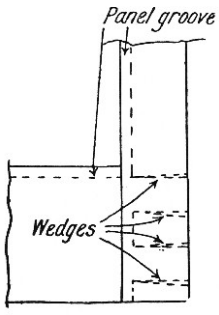


Fig. 5

Figs. 4-6. Plain panelled kitchen door with sectional diagrams of constructional details.

Fig. 6



A Jacobean Door. A fine oak door in the Jacobean style is shown in Fig. 7. The mouldings should be in the solid, i.e. worked on the edges of the stiles and rail as Fig. 8. When preparing the materials remember that the stiles and rails, etc., include the moulding in their width; also, when marking out the tenons, the shoulders reach to the inmost member of the moulding, which is cut away and mitred as in Fig. 9. The materials are first marked out and the mortises and tenons cut; next plough the panel grooves, working the mouldings last.

The mitres of the mouldings should be cut separately at each joint to ensure perfect fitting, and it should be noticed that the wedges at the top and bottom rails occur at the outside only, thus driving the mitre together. The top panel, of 1 in. stuff, is bevelled away at the edges to give a raised effect. A mortise lock is used with brass or beaten iron drop handles.

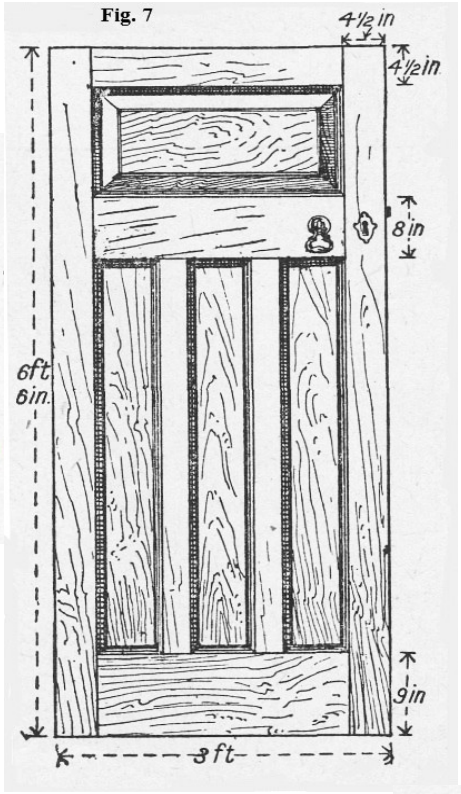


Fig. 7

Fig. 7. Fine oak door in Jacobean style.

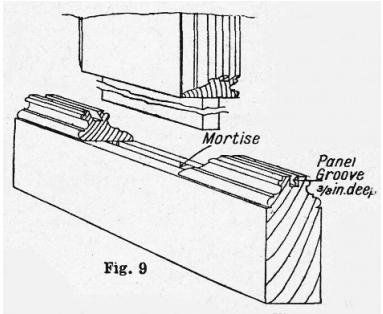


Fig. 9

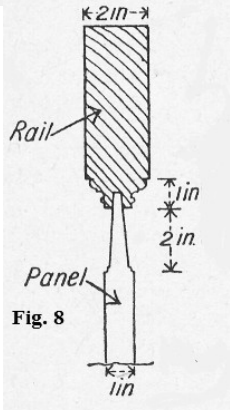


Fig. 8

Figs. 8 and 9. Details of the mouldings, which should be in the solid.

A Tudor Door. Interest is given to an ordinary ledged door by treatment as in Fig. 10. The door is made as in Fig. 1, minus the braces, except that instead of ordinary cut nails, rose-headed nails placed at equal distances are used. The Tudor arch effect is gained by adding a facing portion all round. As the door casing is rebated it will be necessary for this facing to stand in from the edge to clear, as in Fig. 11. To get this true the door should be hinged in position and a pencil line drawn right round the door at the rebate. To this line the facing is fixed. This is ¾ in. thick. The uprights or stiles run right through at the top and are stop-chamfered as shown, a small rounded notch being cut away near the top to take the shape of the arch. The cross-piece is cut to shape, and the arched portion chamfered. The small corner is put in separately, as shown in Fig. 12 by the dotted line indicated.

It is intended that the corner decoration above the arch should take the form of a sunk panel, but this may be omitted if desired. The whole facing is nailed on and the nails punched in and the holes filled in. A rim lock and cross garnet hinges are used, and a beaten iron handle is in keeping with the style.

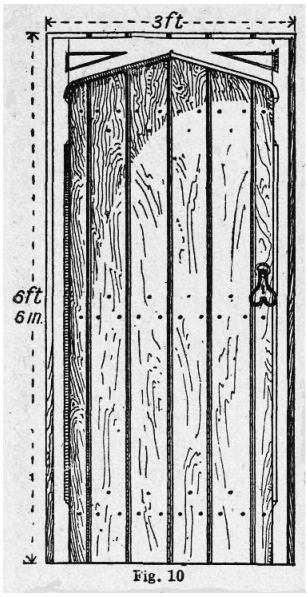
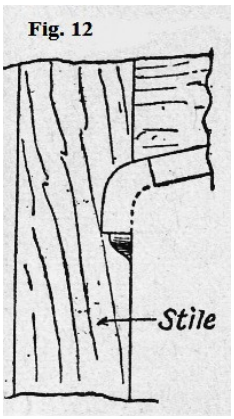
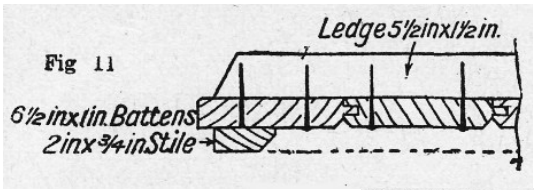
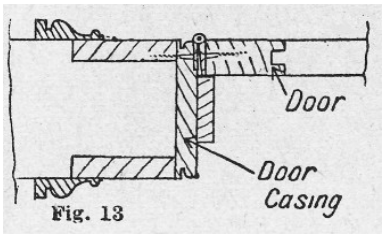


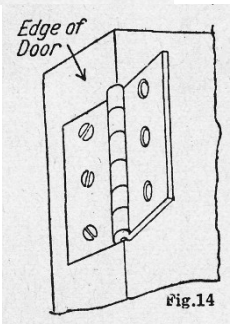
Fig. 10

Door. Figs. 10-12. Ledged door in Tudor style, with detail for shaping the stiles. Figs. 13-14. Diagrams showing method of hinging.









It is necessary to allow a small clearance all round when fitting a door, except at the top corner opposite the hinged side, which will be found gradually to drop in time. When ordinary butts are used, a fairly big clearance is allowed at the bottom for the carpet. If a particularly thick centre carpet is laid leaving a plain surround it is customary to use skew hinges. These take the form of a spiral working on a centre pin, so that as the door opens it is lifted from the floor, thus clearing the carpet, and standing near to the floor when closed. The door also closes automatically by its own weight. These hinges are let in in the usual way, except that the knuckle should stand forward about 1/16 in. from the face. The butts are screwed to the door first, and then to the casing. It really requires two persons to hinge a door; a good plan is to put a thin wedge under the door when screwing, in order to bring it to the required distance off the floor.

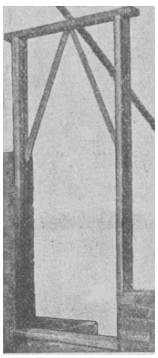
Large doors for a garage or stable often take the form of a ledged and braced door of the type shown in Fig. 1. Still larger doors, especially intended to divide a room into two, are known as folding doors. Various systems are in common use.

In making or repairing doors it is essential to see that the timber is properly seasoned, otherwise warping and swelling are inevitable. The same applies to purchased doors, which can now be bought quite cheaply either in the natural wood, for finishing at home, or ready painted, stained, varnished, or polished.

The Door Frame. This is the structure, usually of wood, that surrounds the door and to which it is hung. Most are composed of posts 3 in. or more in thickness. Thinner frames are generally known as door linings. For most outside work the door frame should be at least 4 in. wide and 3 in. thick, and rebated to form a recess for the door.

A door frame can be made and fitted by the following method, assuming the door to be an outer one, with a wooden threshold or tread. The sides or door posts are cut to length and rebated for the door. A similar piece is prepared for the head, allowing this to project on either side of the door post for building into brickwork, or cut off flush if it has to be set into existing brickwork or concrete which it is not desired to disturb. The threshold or step is then prepared and rebated or not as required. The side posts are mortised and tenoned into the head and secured by wooden pegs properly driven through to make a secure joint by draw-boring (q v.).

The bottoms of the side posts are mortised into the threshold or tread and two stout galvanized iron dowel pegs driven into them, leaving about 2 in. projecting; their purpose is to hold the bottom of the frame secure.



They are embedded in cement mortar and set in holes cut in the brickwork. If the frame has to be set up in new work, it is braced by diagonal struts of rough wood about 3 in. by 1 in., placed as shown in the illustration to prevent the door frame from racking or getting out of the square.

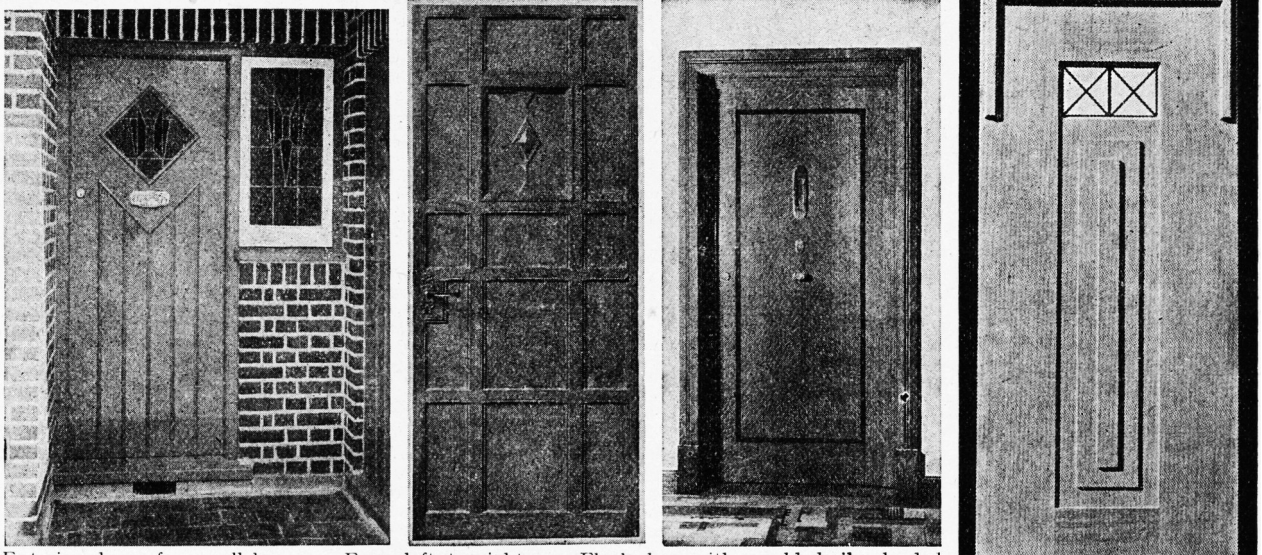
Door. Fig. 15. Door frame placed ready to build in.

The iron dowels are fitted to the brickwork and the frame bedded down on cement mortar, set up plumb and square and held in that position with a temporary strut to the ground, such as the light scaffold-pole seen in the illustration. The brickwork is then built up to the framework.

Finally, the joint between frame and brickwork is made good on the outside by a cement fillet, and by a wood or plaster lining on the inside. In cases where a new frame has to be fitted to an existing opening, the frame is set up plumb and square and secured by wooden wedges driven in hard, over the top of the door

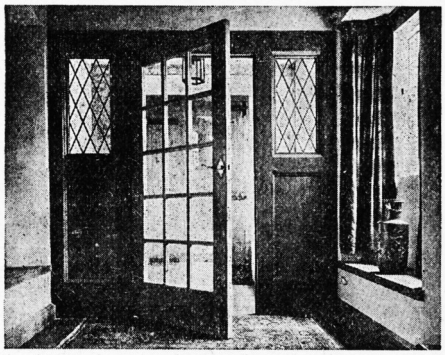
(Continued in page 678)

DOORS: INTERIOR AND EXTERIOR DESIGNS AND WOODS



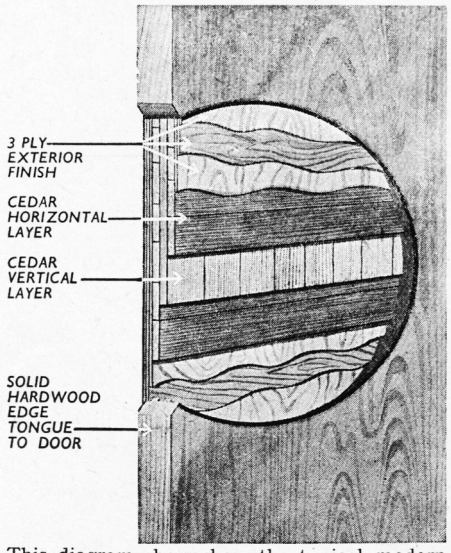
Exterior doors for small houses. From left to right: 1. Flush door with moulded ribs, leaded panel and wing light. 2. Period door in oak. 3. Heavy Yale-locked outer door, with letterbox and bell, for a flatlet. 4. Smooth simplicity in another modern design

Courtesy, F. Evans & Sons, Elliott & Sons (Reading) Ltd., and Soole & Sons



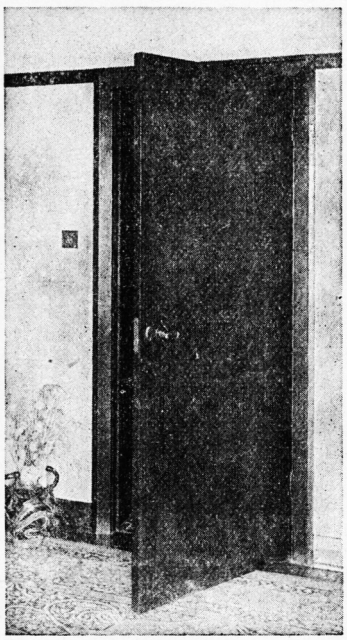
An inner door in glass and unstained oak, with lever latch. Particularly suitable for the hall of a middle-sized detached house

Elliott & Sons (Reading)



This diagram shows how the typical modern flush door is built up. The eight layers make a construction so solid that warping or twisting is impossible

R. G. C. Panels, Ltd.



Plywood flush door for dining room; American walnut, with oak on the reverse side. Size, 2 ft. 8 in. by 6 ft. 6 in.

Courtesy, Venesta Ltd.

Modern Flush Doors

Handsome, simple and modern, these plywood doors (type A), are usually made of straight-grained British Columbian pine, kiln-dried. They are so built that they cannot warp or "bow" outwards, drop or develop a "wavy" surface. Another type (B) is made of solid blockboard. It can be hung either way up, opening right or left, and the mortise lock is concealed within. Alder is best for painting, birch for staining. These doors can be made to measure at a slightly increased price.

FLUSH DOORS

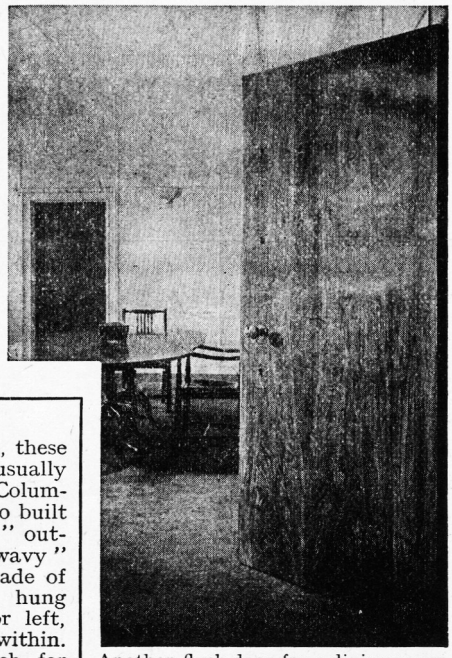
Sizes and Approximate Prices

	ft. in.	ft. in.	*Type A* £ s. d.	*Type B* £ s. d.
Alder	6 0	x 2 0	1 3 0	2 7 9
Oak	6 0	x 2 0	1 14 3	2 16 0
Sapele (Mahogany)	6 6	x 2 4	2 2 9	3 18 3
Walnut	6 8	x 2 8	2 16 6	4 15 3
Columbian Pine	6 0	x 2 0	1 3 6	—

Doors with Different Woods on Either Side

	ft. in.	ft. in.	£ s. d.	£ s. d.
Oak/Alder	6 0	x 2 0	1 8 9	2 12 0
Teak/Alder	8 0	x 2 0	1 9 9	2 13 6

Type A, built up; Type B, solid.



Another flush door for a dining room, in walnut. Also obtainable in richly figured veneered French walnut

Venesta, Ltd.

posts and at the ends of the head. The joint is then made good with a cement fillet and an inner lining as before.

It is frequently found in old buildings that the door frame has perished at the bottom, and when the expense of a new frame is not desired an excellent repair is possible by splicing or scarfing on new feet. Remove the frame and take it to the bench if possible, but where this is not practicable strut the posts to the ground or the floor while the joints are being cut.

Before fixing a new frame, or refixing an old one, it should be treated with wood preservative if it is to be finished with stain, or with two coats of red lead priming if with paintwork.

DOORS: THEIR FURNISHINGS AND FITTINGS

Choosing and Fixing Knockers, Handles, Knobs and Springs.

This article, together with the preceding one on Door gives the householder much useful information on a subject of interest to every home.

Furniture for doors includes knockers, letter plates, handles, knobs, finger plates and key plates. Front doors usually have a knocker, a letter plate and a handle or knob, The last is generally for ornament rather than use on a town house door. Sets for interior doors are commonly made in three pieces, namely, a finger plate, knob and key plate, but sometimes there is a second finger plate fixed below the key plate. It must always be borne in mind that the style of the door furniture should accord with that of the door, and choice of metal or of the material and colour used for fancy sets are points of decorative importance.

Fancy sets, suitable for the less formal type of bedroom and sitting room doors, are made in white or coloured glass. There are also pretty sets obtainable in painted china with wreaths and bunches of o1d-fashioned flowers. For bedroom doors coloured sets in milk composition are suitable and are made in numerous shades. These materials are an improvement on the brass furniture which requires cleaning with metal polish. Such cleaning leaves marks on the surrounding paint and eventually may rub it off. When in doubt with regard to a handle or set for a painted door it is advisable to choose plain glass, which is always in good taste. Sets in raised Chinese lacquer work or in painted glass are handsome in a suitably furnished room.

Door Knockers. The appearance of a front door can be greatly enhanced by the knocker. On massive wooden doors such a design as the lion's head, shown in Fig. 1, would be suitable in wrought iron. Equally striking would be the brass knocker in Queen Anne style (Fig. 2) on a panelled mahogany door or on one painted in dark colour. Another beautiful design is the snake knocker, Fig. 3, which is an excellent choice in hand wrought iron for the brightly coloured town house door. The Adam style of Fig. 4 is graceful in brass and suitable for a flat door. The door of a Georgian style house would be completed perfectly by a brass knocker like that shown in Fig. 5, while for the country cottage or bungalow, either Fig. 6 or 7 would strike a pleasing note. Painted metal door knockers are obtainable which are suitable for small front doors. They are made in many designs, from sailing ships to dogs, and Punch and Judy figures. In smaller sizes such knockers are used for bedrooms in some houses. Combination door knocker, handle, and letter plate sets are known as postal handles. The letter flap of such combination sets is either horizontal or vertical.

Door Handles. Among various classes of door handles the first consists of the type in which the handle forms part of, or is attached to, a spindle for actuating a lock or catch. The simplest is the plain brass knob, fitted to the spindle by a screw thread and set screw, which sometimes gets slack and fails to turn the lock.

The remedy is to screw up the handle, or to remove it and pack the spindle with a wedge shaped piece of metal, refixing the set screw into a new recess drilled in the spindle, as in Fig. 1. Better qualities of such handles are made with a door plate, machined to form a bearing for the handle, and adapted to retain it in position without need for a set screw again using a square shaft. On the inner side of the door a handle would be secured in the ordinary way with a stud or set screw. The lever handle gives ease of control, the door being unfastened by pressing the lever downwards.

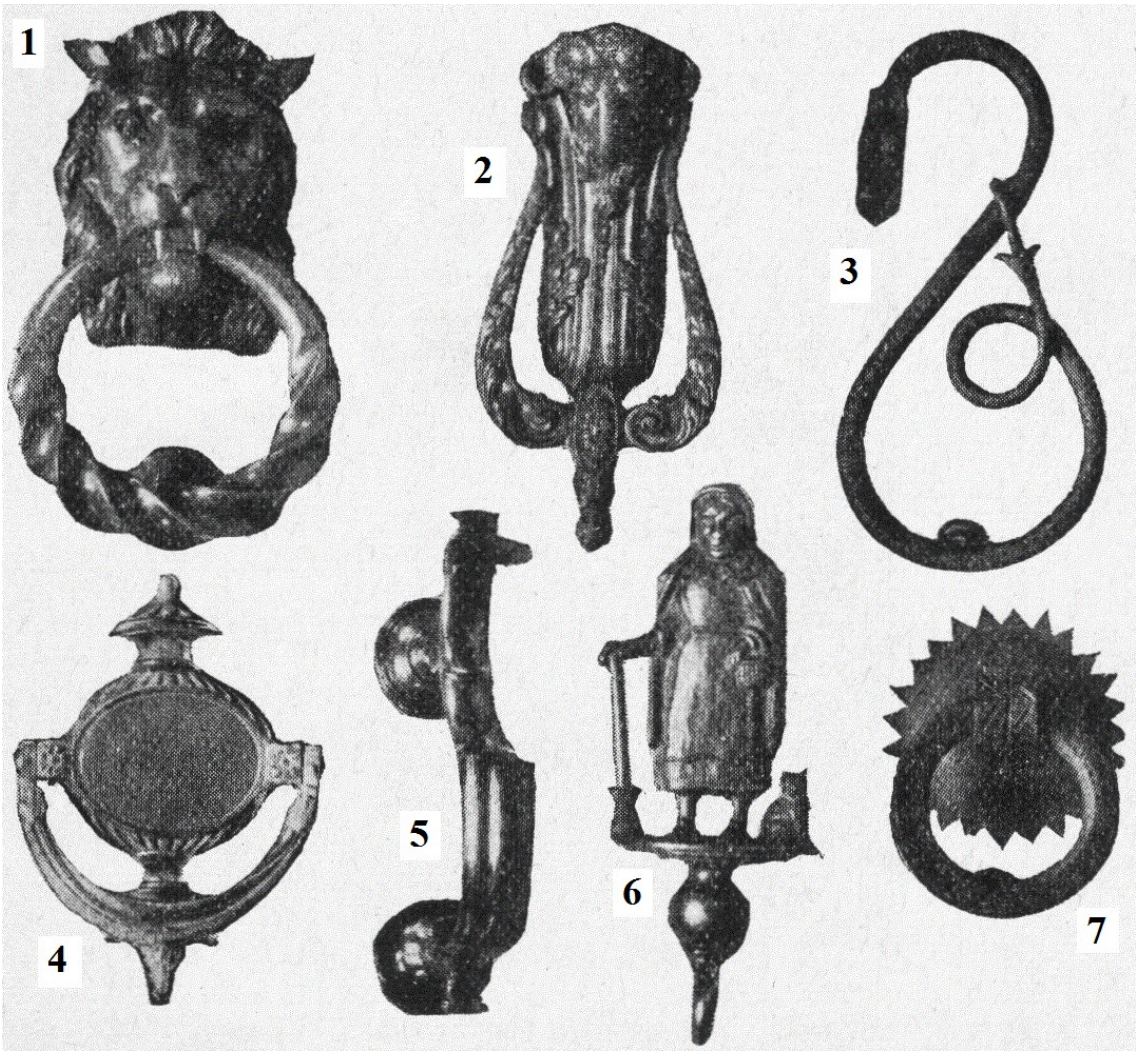
The second class of handle comprises those used in conjunction with a latch, or forming an integral part of the fastening device as the Norfolk latch (Fig. 7). More ornate patterns in wrought iron are sometimes used on entrance doors. Gate latches are sometimes fitted to doors of country cottages, especially the type known as a Gothic gate latch (Fig. 8). Another example is the cupboard door latch (Fig. 9), where the handle has a screwed or squared shank to which is attached a small lever or turn. Latches and locks are dealt with in their respective articles.

The door handle in its simplest form, unconnected with lock or catch, forms a third class. It is used for cabinet work, and on doors fitted on swing hinges and not intended to be latched.

Door Knobs. The cheapest types of door knob screw simply into the door. A hole is bored with a bradawl or gimlet, the knob screwed in as far as possible with the fingers and tightened by means of gas pliers, a piece of cloth being wrapped round the handle to prevent damage by the pliers. Frequently this type of knob is longer in the screw than the thickness of the door. The method of treatment then, shown at Fig. 2, consists in reinforcing the door by screwing or nailing behind it a piece of wood into which the screw can bite.

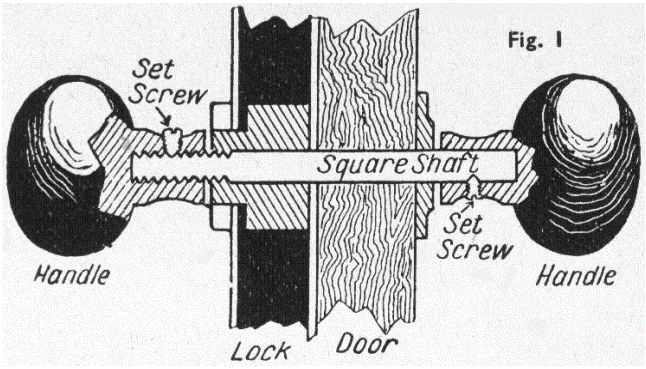
Door Springs. The term door spring covers all kinds of resilient controls adapted to the closing of a door. The simplest device comprises a coiled spring

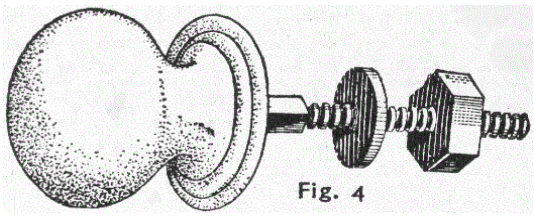
(Continued in page 680)

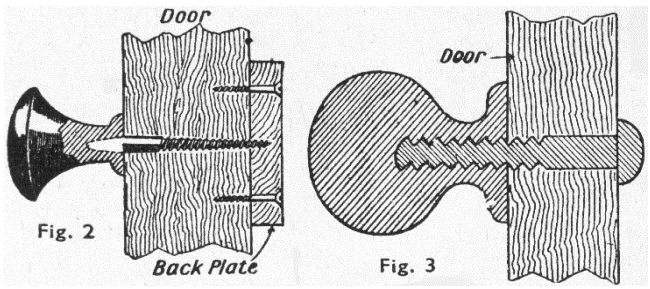


DOOR

Examples of knockers. Beautiful specimens in both wrought iron and brass, from which choices can be made for doors of varying size and period. See text.







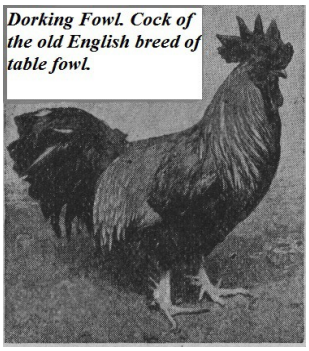
Handles and knobs. Sections of various types and methods of fixing.

having a metal plate at each end, one attached to the door, the other to the frame. The spring is set at a slight angle upwards across the door; it is tensioned by turning one end of the spring with a tommy bar, the other end being fast to the plate fixed to the door frame. The number of turns given to the spring determines the pressure that it can exert, and therefore the speed at which the door will shut without slamming.

The method of securing the spring varies, but a common form comprises a steel pin inserted through a hole in the fixed part of the spring plate, and engaging with a groove in the movable end piece of the spring. Other holes are provided to take the tommy bar, which in emergency may be a stout nail.

Another neat device is a pair of double hung spring hinges.

DORKING FOWL. This fine old English breed is without a rival as a table fowl, having more flesh in proportion to the size of its frame than any other, while in colour, quality and flavour it leaves nothing to be desired. It is a moderate layer, and excels as a sitter and mother. There are five varieties, viz. dark, silver grey, white, cuckoo and red, the first two ranking as best. The Dorking is not adapted to confinement, but is an ideal fowl for the farmyard. *See* Poultry.



Dorking Fowl. Cock of the old English breed of table fowl.

DOSAGE. The estimate of the amount of a drug or of X-rays, etc., to be given in particular circumstances is known as dosage. In the British Pharmacopoeia and similar publications an exact amount is not usually advised, but an upper and lower limit are given, e.g. tincture of opium, 5 to 15 minims, the lower amount being what is necessary to produce any useful effect at all, and the higher the limit of safety. These doses are meant for an adult, i.e. a person of 21 or over.

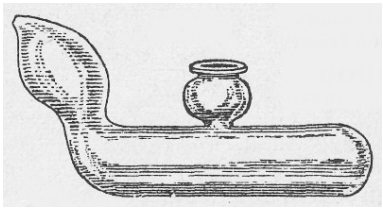
A rough rule for finding the dose of medicine suitable for a young child is to give a fraction of the adult dose calculated by taking the child's age as the numerator and the age plus 12 as the denominator. Thus the fraction of an adult dose of 20 minims for a child of 8 would be $\frac{8}{8+12}$ or $\frac{2}{5}$ of 20, that is 8 minims.

People for whom the average dose is far too much are said to show intolerance for the drug, and a person who has discovered intolerance for particular drugs should mention the circumstances to any doctor who may be called in to treat him.

The dose of a drug injected under the skin is about half of the dose by the mouth.

DOUCHE. As used medicinally a douche is a stream of water or air directed against a particular part of the body, and is used to cleanse or apply fluid medicaments. Astringent douches are employed to allay the discharge resulting from catarrhal inflammation of a mucous surface, and antiseptic douches are valuable for destroying germs.

A douche may also be used for washing out the nose in chronic catarrhal conditions, and a convenient form of apparatus is the glass nasal douche.



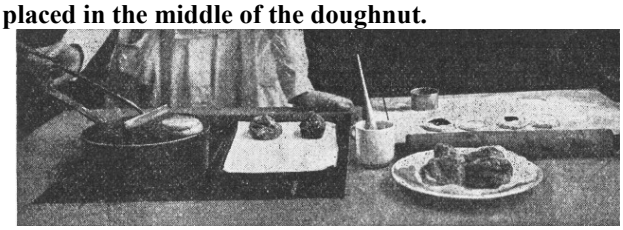
Douche. Nasal douche of glass employed for catarrhal troubles.

DOUGH. By this term is understood a mass of flour moistened and kneaded, but not baked. Sour dough (leaven) can be, if necessary, used instead of yeast to raise flour for bread-making purposes. *See* Baking Powder; Bread; Yeast.

DOUGH CAKE. Before mixing the fruit and other ingredients for dough cakes, grease 2 or 3 cake-tins and line each of them with 2 layers of greased paper, which should reach 5 or 6 in. above the tops of the tins. Then clean and stalk ½ lb. each of currants and sultanas. In a large basin rub ¼ lb. butter into 2 lb. flour, using the tips of the fingers. Afterwards mix in the fruit, ½ lb. moist sugar and ¼ oz. of allspice.

Put 1 oz. compressed yeast in a small basin with 1 teaspoonful of castor sugar, mix them together vigorously with a wooden spoon, and, when they are creamy, add 1 pint tepid milk. Pour this liquid into the flour, etc., mix to a light dough, knead it well, and put it into the prepared tins. Put these in a warm place for 1 hour or more, until the dough has risen to twice its original size, then bake in a hot oven for about 2 hours.

DOUGHNUT. With 1 lb. flour must be used 1 oz. yeast, 2 eggs £ pint milk and ½ lb. each of sugar and margarine. Spices, such as cinnamon and grated nutmeg, can be added, and raspberry jam is usually placed in the middle of the doughnut.



Dougnnut. Four stages in the cooking of doughnuts. The dough ready formed on the board, and being dipped in boiling fat; and the finished cakes, draining on paper, and ready for serving. (Courtesy of Our Homes and Gardens)

The yeast should be dissolved in the milk, previously slightly warmed, and the sugar and about ½ lb. flour stirred in. This mixture is then covered over and put

aside in a warm place. When it has well risen and fallen again it is ready for the addition of the eggs and the margarine. The eggs should be beaten and the margarine melted before they are added, and a pinch of salt sprinkled in.

The dough having been well mixed, another ½ lb. flour is stirred in, and the dough is again put aside in a warm place. After about 10 min. it is laid on a floured board and kneaded into balls, with a small spoonful of jam placed in the centre of each. The balls should be dropped into a deep pan containing boiling lard and cooked for 10 to 15 min. When done they require to be well drained on kitchen paper and rolled while hot in castor sugar.

Doughnuts can also be made successfully with baking-powder instead of with yeast. Beat 4 oz butter, or butter and lard, to a cream, then add 4 oz. white sugar, a beaten egg, and a pinch of salt and of allspice. Mix well together, and add 1 lb. self-raising flour, or household flour, with which a level teaspoonful of baking-powder has been mixed. If the paste is not damp enough, add milk. Turn it on to a floured board and roll to a thickness of about ½ in. Cut into rounds and push a thumb through the centre of each to make rings. Alternatively in the centre of half the rounds, put a dab of jam, and cover with the plain rounds. These will lose their resemblance to sandwiches when cooked as described above.

DOULTON WARE. In its more limited sense, Doulton ware, produced by the Doulton potteries at Lambeth, and elsewhere, consists of salt-glazed stoneware produced with a single firing, decorated with applied mouldings or scratched patterns, called sgraffito, filled in with neutral colours. A special form, called carrara ware, has a crystalline enamel, sometimes finished with gold and colour.

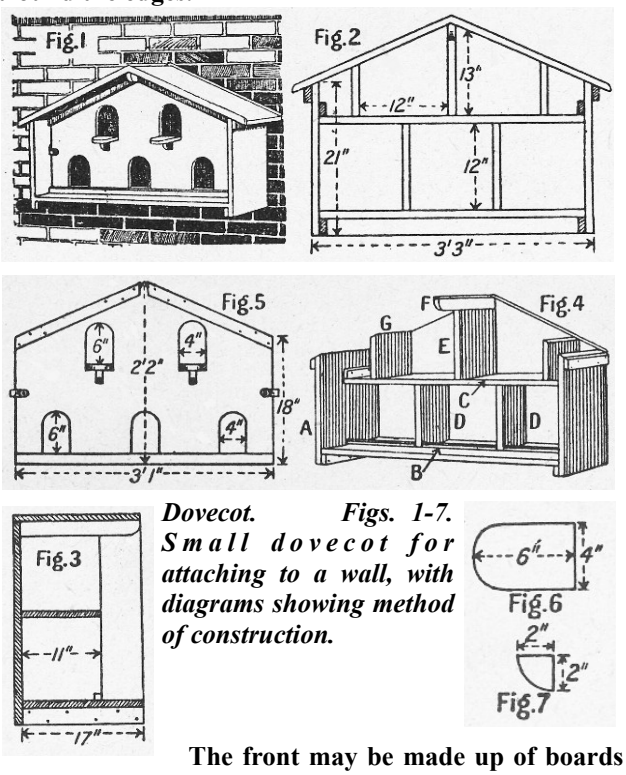
Various forms of twice-fired earthenware are also produced. Doulton faience has a terra-cotta or biscuit body, decorated with scenic or floral paintings and fired under a dull glaze. One of its forms, called impasto, has thin layers of coloured clays, applied to the smooth surface. *See* Faience; Pottery.

DOVE. There are three kinds of dove most usually kept as pets, viz. the ring dove, turtle dove, and stock dove. The first-named, commonly known as the great wood pigeon, is a native of Great Britain; the other two are migrants. The ring dove is a very handsome bird, and its crescent-shaped mark of white, which nearly encircles the neck, stands out in striking relief against its dark, ashen-grey plumage.

Making a Dovecot. In Fig. 1 is shown a hanging dove or pigeon cot which provides accommodation for five pairs of birds, three on the lower storey and two above. The front of the cot is made to open for cleaning purposes, and when in position it is secured with two turn-buttons.

Almost any wood 1 in. thick may be used. Fig. 4 shows a general view of the construction. Required are two sides (A), 1 ft. 9 in. long by 1 ft. 5 in. wide, strengthened with 2 in. battens fixed as shown at Figs. 2, 3 and 4. The bottom of the lower nests (B) is 3 ft. 1 in long by 1 ft. 5 in. wide, and it rests upon battens fixed to the bottom of the sides, to which it is nailed. The bottom of the upper nests (C) is 3 ft. 1 in. long by 11 in. wide, fixed to the upper battens on the inside of the sides.

There are two divisions (D) dividing the lower nests, which are 11 in. wide and simply nailed in position. The centre division (E) of the upper nests is 11 in. wide by 11 in. high, and fitted above is a ridge-piece (F), 1 ft. 5 in. long by 2 in. deep, nailed to the division. The end divisions (G) are 11 in wide by 7½ in. high. It will he necessary to bevel the top edges of the sides, divisions and ridge to suit the slope of the roof. The back boards should befitted horizontally, and nailed to the edges of the sides, bottom and divisions. The roof overhangs about 3 in. at the ends, and to make it quite weather-proof it could be covered with canvas or felt, tacked around the edges.



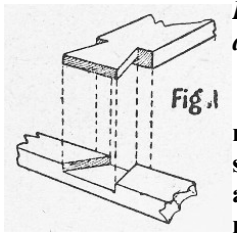
Dovecot. Figs. 1-7. Small dovecot for attaching to a wall, with diagrams showing method of construction.

The front may be made up of boards battened together, as shown at Fig. 5. The entrance holes should be cut as shown, and it will be necessary to cut a small slot at the top for fitting over the ridge piece. The alighting boards for the upper holes (Fig. 6) are nailed to the front, and supported by small bracket pieces (Fig. 7). The turn-buttons for fixing the front to the body of the cot may be of wood fitted to the front with screws. Fit small fillets on the bottom (B), behind the front, to prevent water finding its way into the interior. The inside should be lime-washed and the outside painted. *See* Pigeon.

DOVER'S POWDER. The compound powder made up of ipecacuanha, opium, and potassium sulphate is commonly known as Dover's powder. The

dose is from 5 to 15 grains. It acts as a mild diaphoretic and as a sedative. Five grains taken at bedtime, and followed by hot lemonade or hot whisky and lemon, is a favourite old-fashioned treatment for arresting an oncoming cold. See Opium.

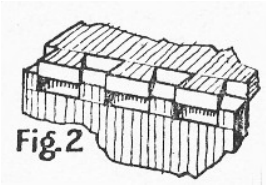
DOVETAIL JOINT. One of the most useful joints in woodwork, the dovetail has great strength, and the ability to resist strains in different directions. The parts are united by so shaping that the outer end is wider than the inner and cannot be pulled apart in the direction of its length. The simplest of the many types is the half-lap dovetail, used tor simple framing, and shown in Fig. 1.

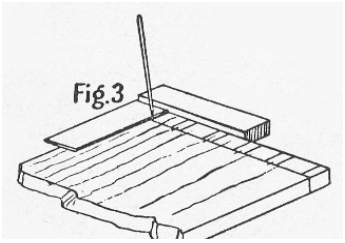


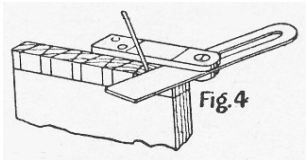
Dovetail. Fig. 1. Simple half-lap dovetail joint.

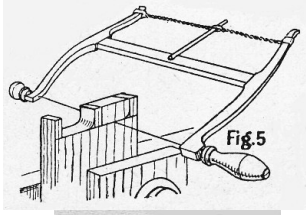
There one member is shown at right angles to the other, but the same joint can be made at any angle, and in the following manner. The joint is first marked out, and the timber sawn from the one part to form a groove, halt the thickness of the wood in depth, and wider at one end than the other. The shoulders, or sides, of the groove are out with the saw, and the wood chiselled away to form the groove. The other part is sawn to the same taper, and half the thickness of the wood sawn away, the joint being finished off by chisel work until a perfect fit is obtained.

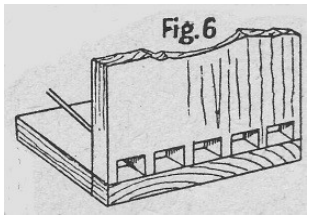
The common dovetail. Fig. 2, is much used on drawers and similar cabinet work. Suppose, the dovetail is wanted on a drawer side, about 9 in. deep, first plane the ends of the wood true and straight; then, with the marking gauge, scribe a line on all faces of each piece, and at a distance from the edge equal to the thickness of the wood; this is known as the shoulder line. The number and shape of the dovetails have now to be set out on the wood, making use of a scriber and the dividers.

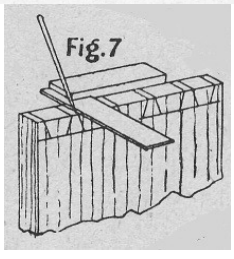


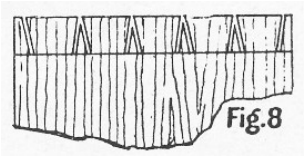


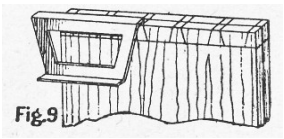












Figs. 2-9. How to mark out and make a common dovetail joint.

First settle the thickness of the pins at their narrowest part, say ½ in., for example. Set off one half this thickness from each end of the shoulder-line, on the outer face of the wood, as the dovetail has to resist outward pressure. Then divide the distance between these points into any number of parts, say five, and from these points mark on each side the half thickness of the pin. Square off with a try-square, and mark off from these points to the end of the wood, as shown in Fig. 3.

Set the bevel square to an angle of about 15°, and mark on the end grain the shape of the dovetail (Fig. 4); then square off from these points with the try-square to the shoulder-line on the opposite side of the wood. Set the job upright in the vice, and cut just inside the lines with a fine-tooth tenon saw, then cut away the waste wood between the saw cuts, either with a bow saw (Fig. 5) or by chiselling; in any case, finish and fit with the chisel.

How to Mark Out the Sockets

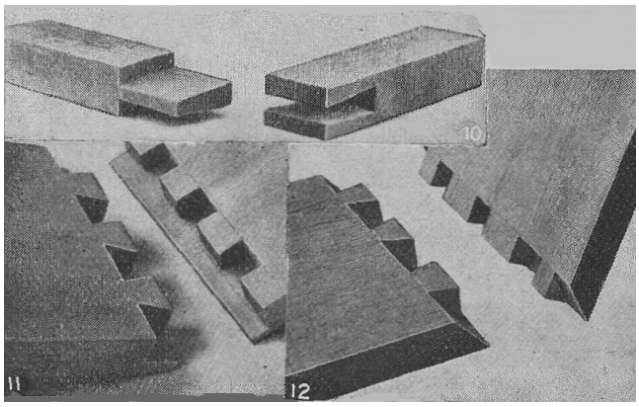
Now mark out the sockets on the other piece. This may be done in the way described above or with a scriber, marking direct from the pins of the corresponding piece. In the latter method the position and shape of the pins is scribed on the wood (Fig. 6), keeping the scriber on the inside, so that the point will not tend to wander from contact with the sides of the pins. Square off on to the end of the wood (Fig. 7), set it up in the vice and saw to the inside of the lines (Fig. 8). Cut away the waste as before, and all that remains is to fit the parts accurately together, doing this with a chisel, and watching the progress of each set.

When much work of the kind has to be done, it is a convenience to use a metal template shaped to the correct angle for marking out the dovetails (Fig. 9). This tool is obtainable from the shops, or is easily made from a piece of thin sheet metal.

When two pieces relatively thick have to be dovetailed, as for the framing of a staircase opening, a single dovetail suffices, as illustrated in Fig. 10. When a dovetail is not to show on the face of the work, as for the front of a drawer, it is known as a lap dovetail. It is set out by scribing a line on the end grain at a distance from the face of the front piece corresponding to the thickness of wood required for the lap or solid part. The pins are then set out in the same manner as before and the waste wood removed by saw kerfing, and careful horizontal and vertical paring. The sockets may be marked out as before and shaped with the saw, and

by paring with the chisel.

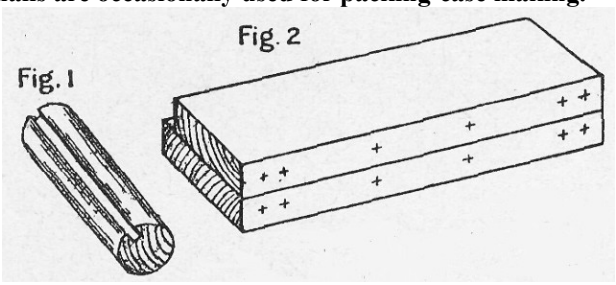
A development of the same idea is the secret lap dovetail, in which no dovetail is visible on any face of the work (Fig. 11). This is accomplished by leaving a lap on each part instead of only the face piece; the work of construction is similar to the previous example, but calls for more skill. When the two lapping parts are mitred instead of being lapped, the joint is known as a mitred secret dovetail (Fig. 12). The construction of the mitred secret dovetail is similar to the lapped secret dovetail, except that the mitre is first set out and roughly shaped, the pins and sockets are formed, and the whole is then very carefully fitted together. *See* Joint.

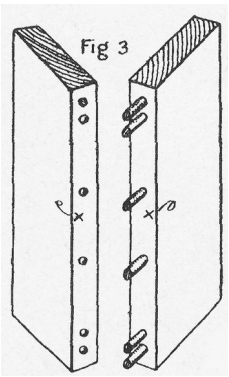


Dovetail. Figs. 10-12. Examples showing various forms of the joint commonly used in cabinet making and joinery.

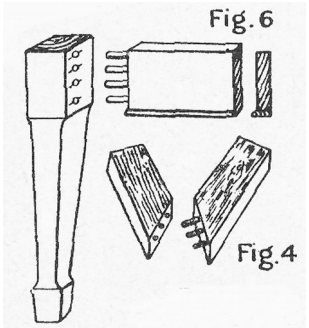
DOWELLING. This is the term given to the method of jointing timber and other materials by wooden or metal pegs called dowels.

Iron dowels are used to secure the uprights of door frames to the stone step, and dowels made from iron nails are occasionally used for packing-case making.





Dowelling. Fig. 1. Grooved dowel. Figs. 2-3. Marking out and fixing dowels to joint two boards. Fig. 4. Mitre joint. Fig. 6. Table leg and framing.



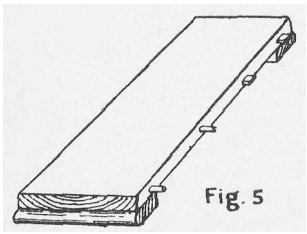


Fig. 5. Leaf of table.

For cabinet making and similar work straight-grained beech wood dowels may be bought in lengths of about 36 in., and of any desired diameter. Fig. 1 shows a dowel with a small groove running along its entire length. The object of this groove is to allow the air and superfluous glue to escape and thus avoid splitting the work on hand; the groove also secretes a certain amount of glue, which increases its hold on the timber.

Fig. 2 illustrates the method of marking out and gauging two boards for dowelling. The edges of the boards are first shot to a true joint; then the face sides are placed together and the lines for the dowels are marked across the edges. The boards are then gauged from the face side, thus giving the points indicated in the sketch. A safe rule for the spacing of dowels when jointing sideboard tops, dressing table and wardrobe ends, etc., is to place the dowels 9 in. to 10 in. apart, and place two dowels at each end, as shown at Figs. 2 and 3. The length of the dowels should be about ⅞ in.

Fig. 3 shows the two boards prepared ready for glueing. The one on the left is bored to receive the dowels, and the one on the right shows the dowels glued in position. It is customary to warm the edges of the boards before spreading the glue. Cramps, to squeeze the joint tight, should be left on the jointed board from one to four hours.

Fig. 4 shows the sketch of a mitred and dowelled frame. One corner only is shown. The dowels should be at right angles to the line of joint, and consequently the dowel at the outside edge of the frame will have to be shorter than the others. Fig. 5 is a leaf for the telescopic screw type of dining table. Circular dowels are shown at one end, and rectangular wooden pegs at the other; both methods are good, and, of course, the dowels are only glued into the leaf. The object of these dowels is to guide the shelf into its proper position when the leaf engages with the table proper, and to make the table and leaf register correctly.

Fig. 6 is a dining table leg and portion of the framing, showing the method of dowelling the frame to the leg. Chairs, couch frames, etc., are made in a similar manner. *See* Cabinet Making; Joint.

DOWER. In English law this was the life interest which a widow formerly had in one-third of her husband's landed property. This right has been abolished in the case of persons dying after 1925. In Scotland a widow has a right called 'terce,' equivalent to dower, which entitles her to a life interest in one third of her husband's property in land. This right still survives. *See* Marriage.

DOWN. The word down is applied to the soft hair found under the feathers of fowls; it also describes

kapok, a vegetable down obtained from such plants as the thistle, etc.

For ordinary purposes, a mixture of down and fine feathers gives excellent results, provided that the mattress, cushion or pillow is given frequent and thorough shakings to prevent lumps from forming. Vegetable down or kapok, which is much cheaper than real down, needs to be separated carefully with the fingers before use to ensure freedom from lumps. The best kind of down is that obtained from the neck of the eider-duck; less expensive varieties include cygnet, duck, and goose-down. *S e e* Cushion; Eiderdown; Pillow; Quilt; Swansdown.

DRABA. Sometimes called whitlow grass, this is a low growing hardy, evergreen alpine plant which must be planted in very gritty soil in a sunny position in the rock garden. During winter it is wise to provide protection by placing pieces of glass over them to keep off excessive rain; the glass should be raised a few inches above the soil by wires. Aizoides, yellow; aizoon, yellow; bruniaefolia, yellow; and pyrenaica, lilac-rose, are some of the chief kinds. Propagation is by seeds sown in gritty soil in the rock garden in spring or by division in September.

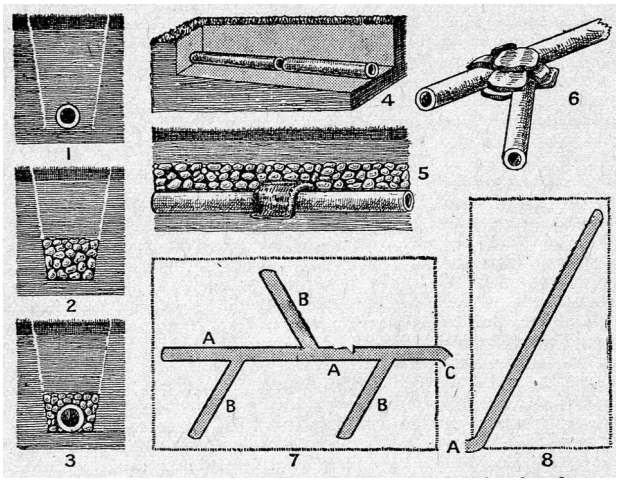
Drachm. Apothecaries' weight equalling 3 scruples or 60 grams. It is distinct from the avoirdupois dram, which contains 27 ⅓ grains.

DRAINAGE: Of the Soil. Surface drainage is important to the householder, as waterlogged soil is a menace to health. Systems of land drainage include grading or sloping the surface of the earth, the provision of ditches and trenches, laying agricultural drain pipes, digging a trench and placing brushwood or rubble in the bottom of it, and then closing in the top with soil.

There must be adequate means for disposal of the surface water at the termination of the pipe lines or trenches. These can generally deliver into a brook or pond; failing that, a soak-away drain must be constructed.

This takes the form of a cavity filled with gravel, rough stone, rubble or any porous material, the water collecting in the cavity and ultimately soaking away into the earth. The site for a new house or bungalow should drain naturally; if it does not, a system of surface drainage must be provided. At the same time some pipes must be introduced through the foundations to dispose of any water that may accumulate beneath the building and cause damp walls or dry rot.

Garden Drainage. Water lying stagnant in a garden instead of passing away fairly quickly is proof that the natural drainage is insufficient. In draining a garden first ascertain by levelling what fall the land has and in which direction it runs. Then take out a narrow trench a foot or so deep at the top end, letting it slope evenly and gradually till it reaches the lowest point in the garden (Fig. 4). If one main drain is not sufficient, secondary drains, herring-bone fashion, must be added, as in Fig. 7. In this diagram the main drain is shown running from A towards C, while the secondary drains are labelled B.



Drainage. Figs. 1-8. Diagrams illustrating the principles of garden drainage here described.
(By special arrangement with Amateur Gardening)

There are three styles of drainage, plain pipe, rubble, and pipe-rubble, illustrated in Figs. 1-3. Secondary drains must be packed with broken tiles where they join the main drain (Fig. 6).

Joints between pipes should be covered with a turf (Fig. 5). The pipes used should have a bore of not less than 2 or 3 in. When rubble is the medium, layers of 6 in. will be found satisfactory. Generally one drain running obliquely, as shown in Fig 8, will be sufficient in the average small garden, or one main drain and secondary drains.

Where there is not opportunity to take the outfall into a ditch or road drain, let it empty into a tank sunk in the soil. Water will not be carried off readily if drainage is laid on the level. In clay garden lands drains should not be farther apart than 15 ft. *See* Drains; Sanitation.

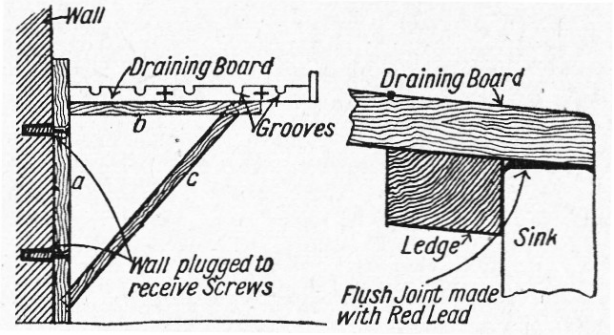
DRAINING BOARD. A draining board is a wooden structure erected at the side of the sink in a kitchen or scullery to facilitate washing up, the dishes as they are washed being laid on it to drain. The draining board should be made from hardwood such as beech or sycamore at least 1 in. thick; its width should equal that of the sink, and the length can be about 3 ft or more according to the space available.

The upper surface must have semicircular grooves formed in it, and spaced about 3 in. apart. The underside of the board is strengthened by ledges 3 in, wide and 1 in. thick. A hardwood skirting board ¾ in. thick and 3 in. wide should be screwed to the board with brass screws to protect the walls from wet. A similar skirting at the front, but only projecting 1 in. above the surface, is a safeguard for crockery.

A draining board should have a fall towards the sink of about 1 in. in every foot of length; moreover, for sanitary reasons, the board should terminate flush with

the walls of the sink and avoid any crevices where dirt or dust could accumulate. Draining boards can frequently be fixed on deal bearers, secured to adjacent walls, otherwise the best plan is to construct a pair of gallows brackets from sound deal 2 in. wide and 1 in. thick, as shown in the illustration. These brackets comprise three elements, (a) a vertical strip to attach to the wall, (b) a horizontal bearer to support the board, and (c) a diagonal strut or brace. The joints can be screwed together, or preferably mortised and tenoned and securely wedged.

Draining boards are kept clean by scrubbing with white sand or using one of the many brands of cleaning powder which are now on the market. *See* Kitchen.



Draining Board supported by a gallows bracket; right, detail of joint between board and edge of sink.

DRAINS: THE DOMESTIC SYSTEM EXPLAINED

Points of Importance to both Landlord and Tenant

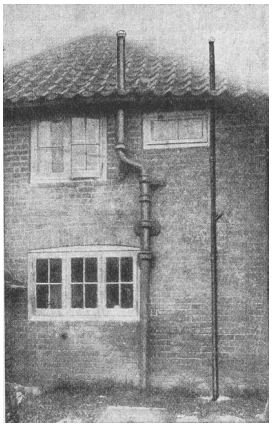
See further the articles on the various types of house, e.g., Bungalow; Cottage; House; also Cesspool; Disinfectant; Refuse; Sanitation; Septic Tank; Water

Essentials in any house drainage system include disconnexion of drains from the sewer by means of traps; disconnexion of rain, bath, and other water waste pipes, by discharging them into the open air above a trapped gulley; adequate ventilation and self-cleansing apparatus.

The following notes illustrate the general requirements of a small house in the matter of drainage. A typical installation comprises the provision of drains for a bath, lavatory basin and sink, a water closet, and means for disposal of rain water. The latter may or may not be a part of the house drainage system, but at least some of the rain water from the roof should be admitted to the drains to ensure periodical cleansing and flushing. In general the whole of the rain water is disposed of by the house drainage system, except where a rain-water storage tank is provided, into which the rain-water pipes would discharge.

The apparatus required is shown in Fig 2, from which it will be seen that the bath and lavatory basin wastes deliver into a separate waste pipe which should be carried up as a ventilating pipe, the open end being above all window openings; usually it is taken just above the eaves.

In modern patterns the bath, lavatory basin and sink have special overflows moulded in the stoneware, and these discharge above the seal of the trap underneath the fitting. Where these overflows are separate they are treated in the same way as the flushing cistern overflow, that is, the pipe is run through the outer wall for about six inches and cut off in a sloping direction. Should the ball valve of the cistern go wrong, or the taps to any fitting be left running, warning is given by reason of the water pouring out of this pipe.



Drains. Fig. 1. Exterior of house showing drainage pipes corresponding to those depicted in Fig. 2.

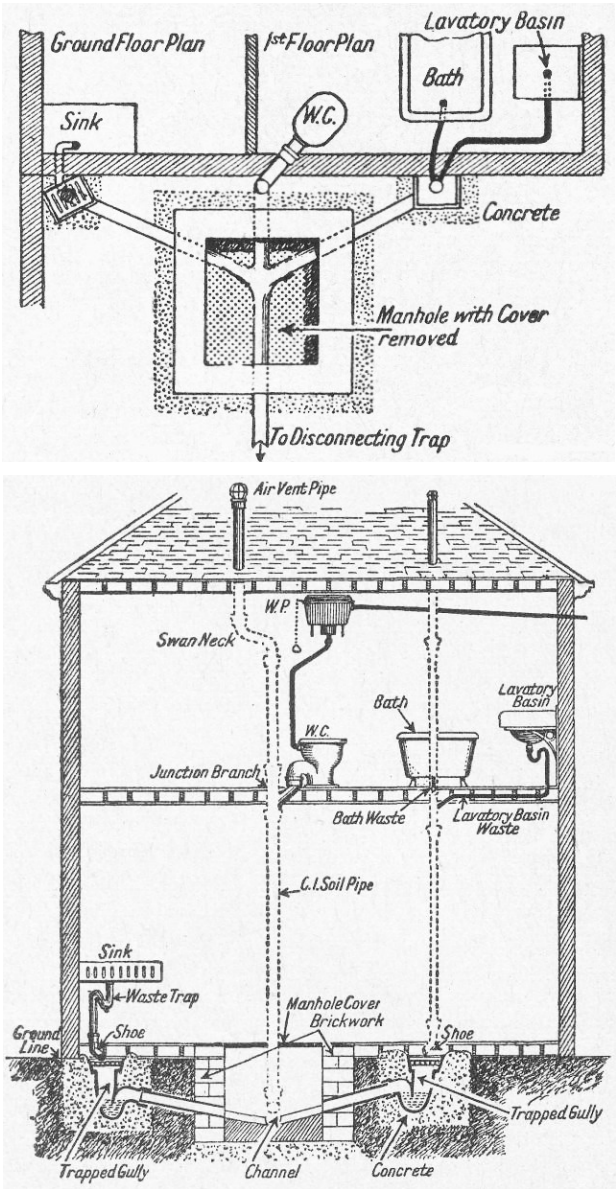
The waste from the water closet passes down the soil pipe, through the manhole and thence to the disconnecting trap. The bath and lavatory basin discharge through the waste pipe under the grid of the trapped gulley. The sink waste discharges in a similar way, and both gullies deliver into the manhole and thence to the disconnecting trap.

The bath, sink, and basin are all fitted with a trap or interceptor, which acts as a water seal; the closet pan incorporates a similar device; hence adequate protection is provided against the entry of foul gas.

A pipe is connected from the manhole to the disconnecting trap, which is situate in a second manhole, marking the termination of the drainage system and the commencement of the sewer. A typical arrangement is shown in Fig. 3, and comprises a disconnecting trap with cleaning eye, a connecting channel, an air inlet or ventilation pipe, and manhole cover. This completes the drainage system.

It is absolutely essential in any system of drainage that sewer gas should be prevented from working back from the sewer (Fig. 3) into the drains. From this arises the importance of the disconnecting trap—a bent or U-shaped pipe, so arranged that water lying in the hollow effectually seals or stops up the channel, the water being impervious to sewer gas. Every time the drains are flushed this water seal is renewed. An inspection or cleaning eye enables the connexion between the trap and sewer to be used for drain rods should that portion become blocked; the eye is closed by means of an air and gas proof plug.

The manhole is built in brickwork and well rendered with cement to guard against leakage. The cover is generally made of cast iron, embedded in cement mortar and sealed with cart grease and sand. The air inlet or vent pipe has a flap or non-return valve at the top; this pipe should be some 2 or 3 ft. above ground level. The purpose is to admit fresh air to the drains; the air ultimately escapes through the air vent pipe which forms the upper termination of the soil pipe, and thus provides a constant current of air through the whole system. The manhole enables any obstructions to be cleared away in case of a stoppage.



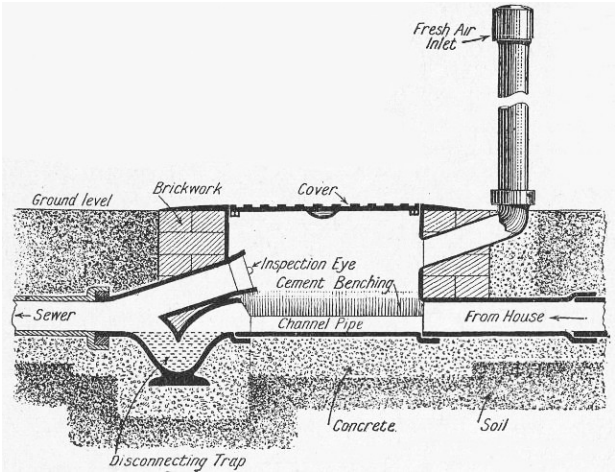
Drains. Fig. 2. Diagrams illustrating in section and plan a typical drainage system for a small house such as that shown in the previous column.

The pipe line between the disconnecting trap and the house manhole must be straight and continuous, with a regular fall of at least 3 inches in 10 ft., and nowhere less than 12 in. below the surface of solid earth. The house manhole serves a similar purpose to the disconnector, with the additional duty of collecting together three separate delivery pipes.

The pipes from the bath and sink waste are brought to the trapped gully, which terminates at about the level of the surrounding ground, and is bedded in concrete and provided with a brick and cement rendered curb. The waste pipes from bath and sink terminate in shoes which discharge over or under the grid of the trapped gully. This acts in the same way as the disconnector, having a similar water seal. A removable cast iron grating is fitted.

The soil pipe is taken by a pipe sloping upwards slightly from the manhole to a bend and thence perpendicularly to a junction branch, the arm of which connects to the water closet which incorporates the water seal or trap. The soil pipe continues upward and terminates at least 3 ft. above the roof level, and is provided with a globular wire cap. Fig. 1 shows the use of a swan neck to avoid leading the pipe past the bathroom window. The provision of traps or water seals, Fig 4, at bath and sink outlets in conjunction with those already described entirely closes every possible inlet for poisonous gases.

Sewage drains must comply with the by-laws and requirements of the sanitary authorities. No alteration must be made without due notice being given, and the work has to be approved by the local authority's inspector.



Drains. Fig. 3. Sectional diagram through disconnecting trap and manhole.

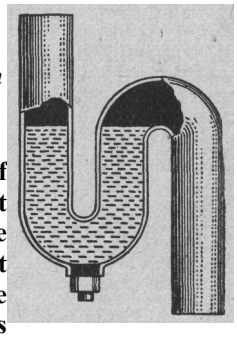


Fig. 4. Water seal or trap for bath or sink waste.

Stoppages. The task of rectifying stoppages is one that brooks of no delay, and the practical man can set about it himself in most cases. If it is the sink or lavatory basin that is choked, as exhibited by water remaining there instead of running away, the stoppage will probably be found in the waste trap. This should have a screw plug at the bottom, and what is required is to place a bucket or receptacle beneath it, remove the plug with a spanner, and with a flexible cane or soft wire endeavour to remove the obstruction. Take care that the receptacle is sufficiently large, as the trap itself holds a fair amount of water, and if much remains in the sink or basin a small bucket might fill to overflowing.

Should the stoppage be below the trap, it can be removed by plunging with a force cup, first replacing the plug. Sometimes the palm of the hand cupped and pressed down over the outlet will force water down the pipe and get rid of the obstruction, if a little water is first run into the basin.

When a water-closet is choked up, the obstruction is almost always in the trap at the bottom and back of the

pan. This can sometimes be cleared with a flexible cane, by using the force cup, or plunging.

When there is a stoppage in any of the drain pipes, take off the manhole cover and ascertain where the stoppage occurs. This is tested by pouring water down the pipes and noting which one is choked, either by the absence of water or by the fact that it only trickles out slowly. It can then be cleared by pushing a drain rod through and at the same time pouring in liberal quantities of water at the highest available point of the system. When this fails, a screw end can be attached to the rods and worked in, and the obstruction cleared by drawing it backwards. When handling these rods it has to be remembered that they are screwed together, consequently they must be twisted to the right or the joints may unscrew and a length of rod be left in the drain. Rods having patent locking joints are, as a general rule, free from this defect.

A drain that is only partially obstructed can sometimes be cleared by plugging the outlet into the manhole with sacking and then allowing the pipes to fill with water. On suddenly removing the sacking, the rush of water will often dislodge the obstruction. When a complete stoppage occurs, a plunger of leather can be affixed to the end of the drain rod and the obstruction forced out, using the rods as a plunger or force pump.

Should there be any suspicion that a drain is leaking, as evidenced by an unpleasant smell, the drains should be tested by a competent person, the seat of the trouble ascertained, and the cause remedied. This in dry weather may be nothing more serious than evaporation of the water in a trapped gully. In this case the remedy is to fill the gully with clean water.

The Legal Position. A tenant, when he or she takes possession of a house, may or may not receive from the owner a verbal or written guarantee that the drains are in proper order. He may, however, have the drains tested, and, in certain cases under the Rent Acts may refuse to pay increases of rent made on the ground that the landlord is liable for repairs if a sanitary inspector certifies that the house is not reasonably fit for habitation.

If a drain gets out of order by stoppage or foul smell, the tenant should at once inform the landlord, after first endeavouring to remedy the nuisance, e.g. by flushing with hot water and soda, or by using a rod and plunger. If the landlord fails to make the drain right and the householder feels that his family's health is being imperilled, he can call in the local sanitary authority.

Where the drain is condemned as faulty the owner has no alternative but to take it up and substitute an entirely new one.

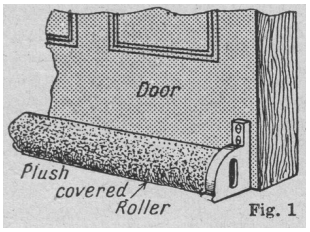
A tenant who takes a house for a term of years is bound in the absence of anything to the contrary in his tenancy agreement to keep the existing drains in repair, but is not liable for repairs, due to bad construction of the drains. If a tenant or his family become ill owing to faulty drains through no fault of the tenant, a claim may lie against the owner of the house. Anyone building his own house must have the sewage drain pipes passed by the local authority before filling in.

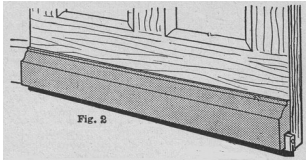
DRAUGHT: How to Avoid. A draught is frequently due to faulty ventilation, as for example in a small room, when the doors and windows are closed and a fire is burning. Under such circumstances air must be admitted to the room, and unless the doors and windows are absolutely airtight, the heated air will ascend up the chimney and a strong suction be exerted upon any cracks and crevices, with a draught as the result.

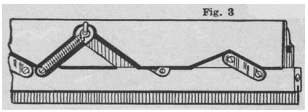
The most effective cure for a draught is to give attention to the adequate ventilation of the room, as by opening a window at the top, by the provision of air bricks, or any means that admit sufficient fresh air at a low velocity. When the air is admitted slowly an objectionable draught is not created. It is the large quantity of air entering at high speed through a small hole that gives the trouble. Adequate treatment on these lines is more in the nature of building construction and should have attention when the house is being built.

Conditions are somewhat different in boisterous weather, as a strong wind will force air through a crevice that would otherwise be draughtproof. Doors and windows are the chief offenders, and the trouble is generally due to defective workmanship and material. The remedy is, however, simple and effective. India-rubber draught tube with a canvas flange can be glued or nailed round the window frame so that it seals the joints or covers the cracks. Felt or cloth strips are more durable, as they never crack; rubber is prone to dry up and split in hot weather.

Sash windows are effectively protected by cloth-covered sandbags made in the form of long rolls.







Draught Excluder. Figs. 1-3. Devices for closing the gap between door and floor.

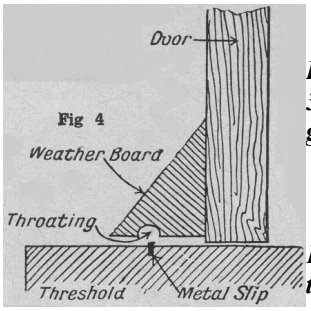


Fig. 4. Weatherboard fitted to an outside door.

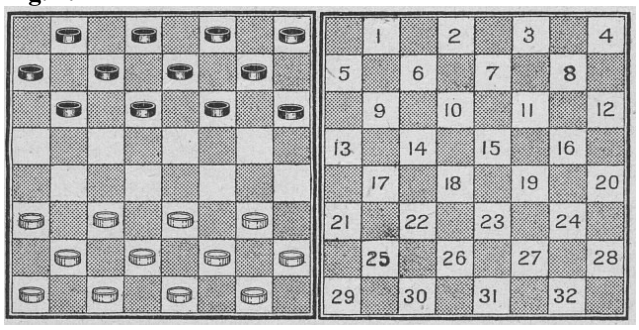
Draught Excluder. Fittings of various kinds are obtainable to close the gap between door and floor. Fig. 1 shows a device consisting of a cloth or plush-covered roller loosely mounted in brass brackets screwed to the door. This rolls over the floor when the door is opened or closed, but when at rest the roller lies upon the

ground and checks the draught. One type of automatic device is shown in Figs. 2 and 3, and comprises a moulded strip attached near the bottom of the door. The end of a sliding member projects and is pushed back by the door frame, thus forcing the movable strip down on to the floor. A tight joint is ensured by means of a flexible rubber strip at the extremity of the slide. A concealed spring lifts the strip clear of the floor as the door is opened. Owing to the method of cutting the diagonal slots, this type of excluder may be readily reversed to suit the hand of the door.

When considering the application of draught-excluding devices it is best to inspect the door-frames and to make sure the door shuts up tight against the door-stop. If it does not, the stopping can be removed and replaced so that it abuts against the door, and this will stop the draught. The door-latch may be slack, allowing the door to rattle. This can be remedied by overhauling the lock or by resetting the socket or staple.

Outside doors are often improved by the addition of a weatherboard (Fig. 4), but this must be throated or grooved as shown, or the rain-water will work its way in under the door. A narrow metal slip projecting slightly above the surface of the threshold will often be a boon in checking a draught.

DRAUGHTS. This game, in America called checkers, is played between two opponents on half of the squares of the chessboard, either on the 32 white squares or on the 32 black squares. For convenience it is here assumed that the white squares are used, in which case the board is set with a black square to the right hand of each player. Each side has 12 pieces, all of the same shape, which are placed at the start in the position shown in Fig. 1. In the notation which enables games to be recorded the squares are numbered as in Fig. 2.



Draughts. Fig. 1 (left). The pieces set out ready for the game to begin. Fig. 2. Notation of the board.

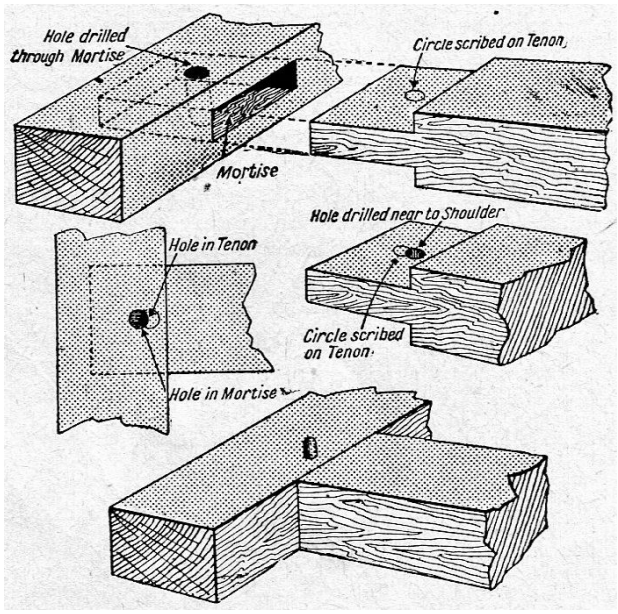
A draughtsman moves one square forward diagonally. If a man of the opposite colour stands in the way, with a vacant square immediately behind him on the same diagonal, that man can be captured by jumping over him on to the vacant square, and removing him from the board. Thus, if in the initial position black (who invariably has the first move in draughts) plays from 11 to 15 and white replies by moving from 22 to 18, black jumps from 15 to 22 and removes the hostile man from 18. Further, not merely one man can be captured at a time, but a succession of men, all in the same move. Suppose a black man to stand on 1 and three white men on 6, 15 and 23. Black can jump in succession to 10, 19 and 26, removing the hostile pieces.

The object in draughts is to capture all the opponent's pieces or to reduce them to such a position that they cannot move at all, in either of which cases the game is won. When a capture is possible it must be made. If by error it is not made, there is a penalty called huffing, which consists in removing the piece which could have made the capture off the board, this huffing not counting as a move. It is a player's option either to huff his opponent, to insist upon his making the capture, or simply to let the wrong move stand.

When a man reaches the farther side of the board (the 8th rank away from the player) he becomes a king, with the power of moving and capturing backwards as well as forwards. A king is shown by crowning, i.e. putting a spare piece upon him. The reaching of the 8th rank completes a move. Suppose a black man to stand on 21 and two white men on 25 and 26. Black can play to 30, capturing the man on 25 and making his own man a king; but he cannot in the same move capture the man on 26.

Draughtsmanship. *See* Drawings.

DRAW-BORING. This method is employed for pegging the components of a mortise and tenon joint so that the joint faces are drawn tightly together. The method consists in drilling a hole through and at right angles to the mortise. Next put the tenon into the mortise, and drive it home; then mark on the tenon the position of the hole in the mortise, by scribing a circle on the tenon, using the hole in the mortise as a guide.



Draw-boring. Various stages in this method of making tight-fitting mortise joints.

Remove the tenon, and, supporting it on a block of waste wood, drill a hole, the same size as that in the

mortise, but nearer the shoulder of the tenon, the usual amount being slightly less than the half diameter. Prepare a tapered hardwood pin of a size to suit the hole, put the joint together after removing any ragged edges around the holes, and drive the pin home with a hammer or mallet. The peg then acts as a wedge and draws the shoulders of the tenon very tightly against the mortise, and to a certain extent obviates the need for a cramp. If the joint is to be permanent it can be secured with glue and the peg glued in as well. When, the glue is dry the projecting ends are cleaned off smooth and flush. If it is considered desirable to be able at a subsequent time to take the joint apart, the thin end of the peg should be left projecting so that it can be knocked out when desired.

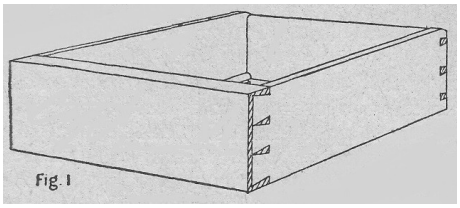
The peg hole should be nearer the edge of the wood against which the shoulder fits. A common practice is to drill the hole so that its centre is 1½ times the diameter from the edge of the wood. The various stages in making this joint are illustrated.

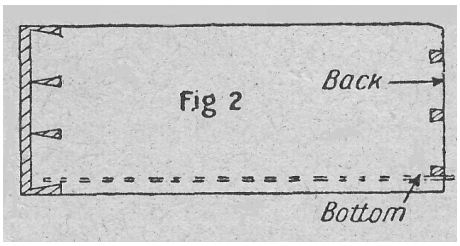
DRAWER: How to Make. For drawer construction dovetails are the ideal joints to use, since by their formation they exert resistance in the direction of the chief strain to which a drawer is exposed, i.e. the forward pull. The ordinary hand-cut drawer dovetail does not vary much in form, except, of course, when the particular construction or formation of the job requires different treatment. Fig. 1 is typical of the average drawer. When making one of medium size, it is usual to use 1 in. or ¾ in. stuff for the front, and ½ in. or ⅜ in. for the sides and back. At the front the dovetails do not run right through, a small lap being left on the front. This is necessary to hide the ends of the dovetails, which would otherwise disfigure the front. To make a drawer such as Fig. 1, all the stuff is first planed up and thicknessed, and marked in the relative positions which they are to occupy. The front is then planed to fit exactly between the rails. A good plan when fitting this is to cant the edges very slightly inwards, so that the front wedges in between the rails. The sides are also planed to fit just hand-tight, and both ends squared off.

The back is now squared up at both ends to coincide with the job, but it does not occupy the full width of the drawer. At the top it stands down about ¼ in., and stands on the drawer bottom (Fig. 1), so that the position of the bottom must be decided upon; ¼ in. is usually sufficient for this to stand up, so that the distance, added to the thickness of the bottom, will give the bottom position for the back.

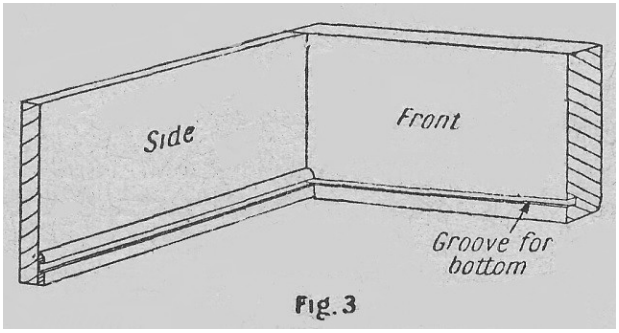
When marking out the dovetails, note that the groove for the bottom is contained within the lower front dovetail, as the groove would otherwise show a gap in the pins. At the back the square lower edge of the bottom runs right through along the pin, so that when the side is marked out this is cut square (Fig. 2). When all the joints are cut, the front is grooved for the bottom and the top edge of the back rounded over; the drawer is then glued up.

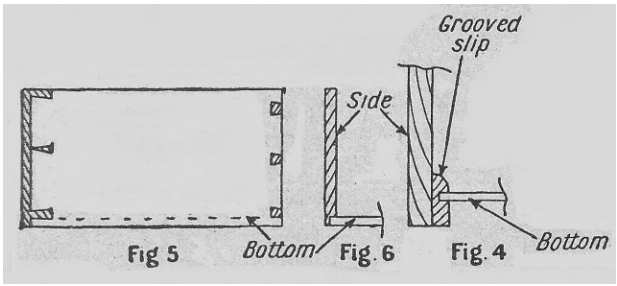
Figs. 3 and 4 show how the bottom is held at the sides, grooved slips being glued to the sides. The object of using these instead of grooving the sides is partly to present a greater width underneath, thus giving greater wear resistance to the runners, and partly to avoid weakening the sides. The bottom is either nailed or screwed to the back, and is made sufficiently wide to stand out from the back about ⅜ in., so that in the event of it shrinking the screws can be taken out and the bottom pushed forward.





Drawer. Figs. 1-6. Diagrams showing the component parts and details of construction of an ordinary drawer.





Centre Support for a Long Drawer

In the event of the drawer exceeding 18 in. or so in length, a centre support for the bottom should be fixed. This is about 2 in. wideband is grooved in the same way as the slips. A stub tenon is cut at the front to fit into the groove in the drawer front, and the support is held at the back with screws, the upper lipping being cut away to bring the groove against the back. The drawer is then fitted and the top back corners bevelled off (Fig. 2). The running of the drawer is facilitated if the sides are slightly bevelled off at the back along the dovetails.

Ordinary candle-grease is a good lubricant to use to ensure smooth running.

In cases where it is required to place the bottom flush underneath, as, for instance, in the trinket drawers of a dressing table, a rebate is run round the front and sides, as in Fig. 6, and the bottom dropped in this. It is also necessary to arrange the dovetails as illustrated in Fig. 5 to prevent any gaps showing at the sides. *See* Birds' Egg Cabinet; Bureau; Chest; Chest of Drawers; Desk; Dressing Table; Wardrobe, etc.

DRAWINGS: THEIR PREPARATIONS AND USE

Some Practical Hints for the Amateur Craftsman

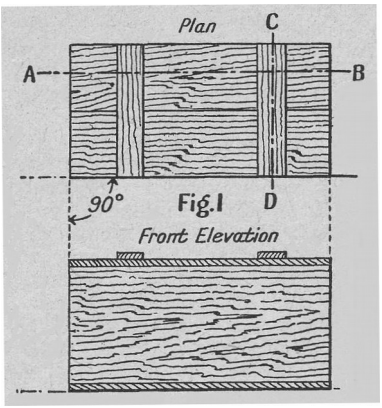
The facts given in this contribution, together with the illustrations, are intended to help those who wish to make any of the constructional articles described in this work.

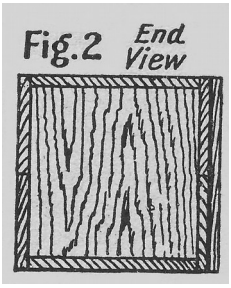
The ability to produce an intelligible drawing is of great value to all amateur constructors. The tools and materials required need not be expensive, but it is well to buy reliable instruments. A minimum outfit comprises a drawing-board, tee square, set squares with angles of 45°, 60°, and 30°, one or two ruling pens and a 6 in. half set of drawing instruments (the latter comprising compasses with ink and pencil points, an extension bar, and a pair of dividers); drawing paper and pencils, some Indian ink, a piece of indiarubber and a few drawing pins. It will be well to add a pair of small spring bow compasses with ink and pencil points, as these are handy for drawing small circles.

For all-round use the imperial-size drawing board is the most convenient. This measures 32 in. by 23 in. and it may be of the cheap, clamped variety or, preferably, with battens on the underside. For mechanical drawing it should be truly square on the left-hand side, the left edge being used to guide the stock of the tee square. The ordinary cheap clamped board made of sound, dry pine, will last for many years, and has the advantage that both sides are available. The best quality boards are made with battens on the underside, and are grooved to allow the wood to expand and contract. For the same reason the battens are secured to the board with slotted plates and screws. They usually have an ebony or hardwood slip inserted in the left-hand edge for the tee square to work upon.

Essential qualities in the tee square are straightness of the ruling edge. This can be tested by ruling a line, turning the square upside down, and ruling another line on top of the first one ; if the edge of the tee square is true the two lines will coincide and appear as one. The preferable form of tee square is made in mahogany with ebony edge.

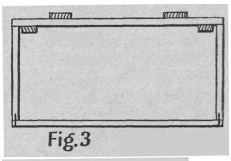
In choosing set squares, those made of celluloid or a transparent material are to be preferred, and should have one edge bevelled, as this minimises risk of the ink running under while using the ruling-pen. Compasses should have fine sharp points, preferably those with a needle held in a clamp; should have firm joints and exhibit no shake or play on any of the joints. The various types and qualities are discussed at length under the heading Compasses (q.v.). The same remarks apply to dividers.

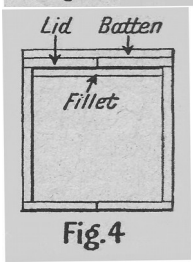




Drawing. Figs. 1 and 2. Elevations and plan of a simple wooden box.

The ruling pen comprises a fixed and a movable steel blade, the ink being inserted between them by means of a small brush or an ordinary pen. It is essential that the exterior of the blades be free from ink, otherwise it will be liable to cause a blot when ruling a line. The pencils are preferably of the hexagonal type, as these do not roll off the board so easily as the round one. For fine work a hard pencil, such as an H.H., is to be preferred; but where much rubbing out has to be done, a softer pencil, such as an H.B. or B. is more convenient, as it is more readily erased. Pencils should be sharpened to a chisel point.





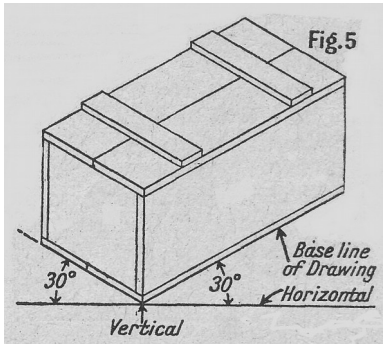
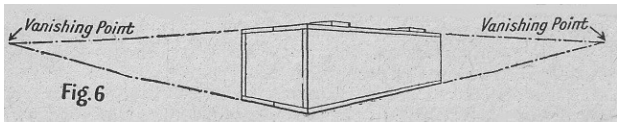


Fig. 3. Sectional view at A B. Fig. 4. Section at C D. Fig. 5. Isometric projection. Fig. 6. Perspective drawing of box.



For ordinary working drawings cartridge paper will be found quite suitable, but for more highly finished drawings in ink, a smooth-surface paper should be used, such as a Whatman H.P., or hot pressed paper. The only inks that are of any practical use for mechanical drawings are those generally known as Indian inks.

In using compasses or dividers, place the metal point exactly on the line or centre from which measurements are to be taken. If equal on both sides of a centre line,

mark them by rotating the dividers or compasses whi1e the needle point rests exactly upon the centre line; as far as possible take all dimensions from a few centre lines. When using ruling pens or the pen points in the compasses, charge them with ink from a brush or pen, wipe the points of the blades clean with a piece of rag wrapped round the finger, and before ruling long lines see that the blades have sufficient ink between them, as it is difficult to join up the two parts of a straight line. The pen should travel at an even speed over the paper, be held nearly upright, and always at the same angle to the paper. Before laying the pens aside, wipe off the ink with a piece of rag or blotting paper. The points of all drawing pens should be kept sharp but perfectly smooth by setting them occasionally on a piece of fine oil stone. Other instruments used in mechanical drawing comprise proportional compasses, French curves, parallel rulers, scales, and other special appliances.

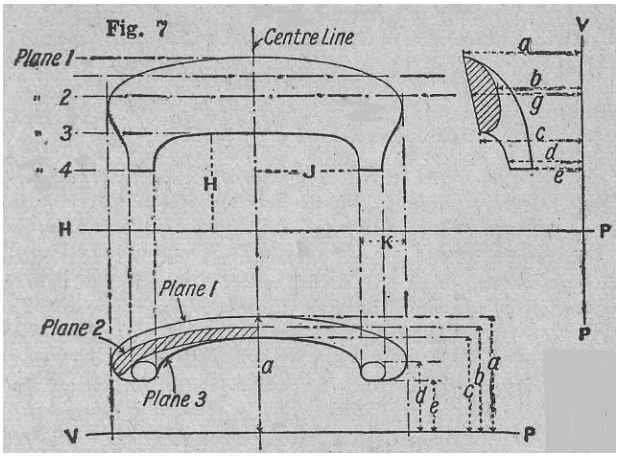
Methods of Projection. There are several ways in which an object may be depicted. Simple projection assumes that every part of the object visible in, say, a vertical plane is projected upon an imaginary flat surface, although, in fact, the object may be curved or of any other shape. It is usual in mechanical drawing to show a plan of the object, that is, the appearance as seen from above, and a front elevation or view of the object as seen from the front and projected upon a plane at right angles to that of the plan; an end view is also drawn upon a plane at right angles to that of the plan, and also at right angles to that of the front elevation.

Where the object is differently shaped on both sides and both ends, elevations are given of all these four sides. Suppose now the object were hollow and that the cavity could not be seen from the exterior, this would be depicted by means of a section, this being neither more nor less than projections on a vertical or horizontal plane imagined as passing through the object, and it thus shows its shape as if it were parted asunder with a saw.

Isometric projection is a method of showing three surfaces of an object simultaneously, whereas plain projection shows only one face on any one elevation. In drawing an object in isometric projection, all horizontal lines are measured from one centre point along lines inclined at 30° to the horizontal. Vertical dimensions are taken at any necessary place along these inclined base lines.

In Figs. 1 and 2 a simple wooden box with the planes marked on the drawing shows the various elevations. The sections through the box are shown in Figs. 3 and 4. The same box has been drawn to the same scale by isometric projection in Fig. 5, and in Fig. 6 again in mechanical perspective.

Comparison of the three processes and their relative advantages can therefore be made. By the first system the actual shape and size of the object is depicted either full size or to any convenient scale. The isometric projection gives a better impression of the appearance of the finished object, and dimensions can be scaled off from it. In the third illustration the appearance of the article is extremely good, but it is not practicable conveniently to take any dimensions from the drawing. Hence for a working or mechanical drawing, the first system is the best for amateur purposes, The second system is very good, as it indicates something of the external appearance of the object and provides the necessary means of measurement. The third system is of value to the architect or constructor who wishes to show the correct appearance of the article when it is finished.



Drawing. Fig. 7. How to set out the working drawing of a chair back.

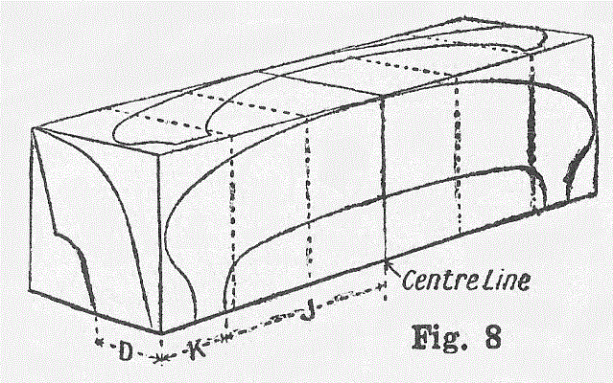


Fig. 8. The curves shown in Fig. 7 transferred to the wood.

No special instructions are required for the preparation of drawings of objects that are made from flat material with straight or angular surfaces and edges. It is in drawing curved surfaces that greater difficulty is met with, and as an example Fig. 7 shows one method of drawing part of a chair back, and clearly indicates what has to be done in preparing a drawing for such a piece of furniture. To transfer the curves to the work it is desirable to draw lines at right angles to one or more of the edges of the piece of wood from which the chair back is to be made; and to set off the distances along these lines and transfer them to similar lines drawn upon the wood itself, drawing the curve through the points thus found. The method is illustrated in Fig. 8.

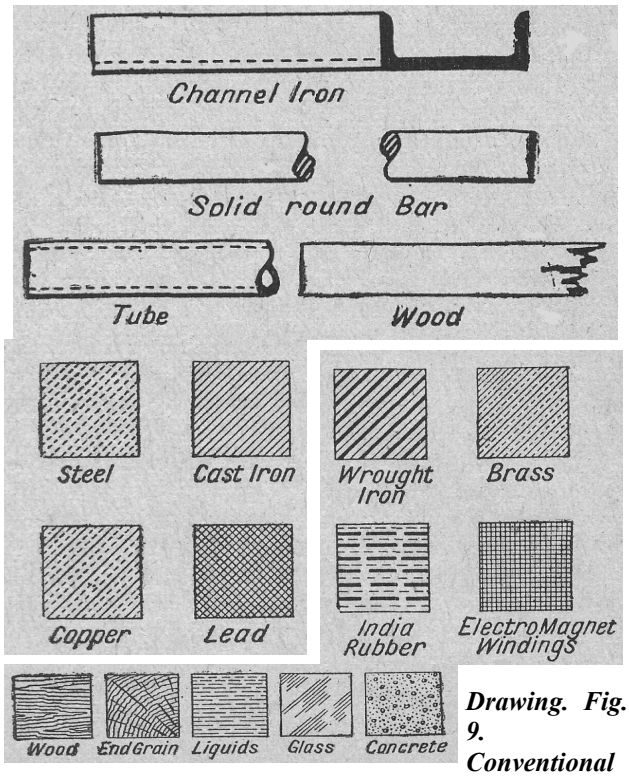
Scale Drawings. The amateur cabinet maker

should try his hand at a scale drawing of the article he is about to construct, practising until he is able to draw mouldings or other details full size from a scale sketch. There is nothing really difficult in this; it is a matter of knowing how to use the T-square and rule, and rarely involves freehand drawing. The great advantage of a scale drawing is that it shows at once whether the proportions are good. Error may be avoided if the elevation of the piece of furniture is set out to scale.

It is equally desirable to know how to set out the complete vertical and horizontal sections of a cabinet or other article full size, We know exactly then what we are doing, and every dimension—length, width and thickness —may be taken from our set-out. It is not only that the work itself is rendered easier, but again and again we are saved the mortification which results in the discovery that, through some trifling miscalculation, we have cut a costly bit of fine wood the wrong size. Careful setting-out, indeed, is the first step towards the attainment of good results in all cabinet work.

In making a full sized drawing of some detail, e.g. a chair back, squares may be ruled on the small sketch and the drawing transferred square by square to paper similarly ruled on the enlarged scale. By numbering the squares vertically and horizontally the chance of error may be eliminated. Where necessary in our constructional articles a squared detail sketch is given, the scale being indicated.

Certain conventional treatments are generally followed in draughtsmanship to indicate sections, different materials. screw threads, and the internal shape of an object, examples of all of which are given in Fig. 9.



Drawing. Fig. 9. Conventional methods of treating various materials in mechanical drawing.

The Finishing Touches. Drawings are usually finished after completion in pencil by going over all essential lines with Indian ink, using the ruling pens, and ink points on the compasses, after which the dimensions are given and the points from which they are taken indicated by dotted lines, the latter conveniently drawn in a different coloured ink. If a drawing is to look well it should be neatly lettered; simple sloping letters are easier to draw than those which are upright. Various simple letterings and methods of ruling for them are illustrated in Fig. 10.

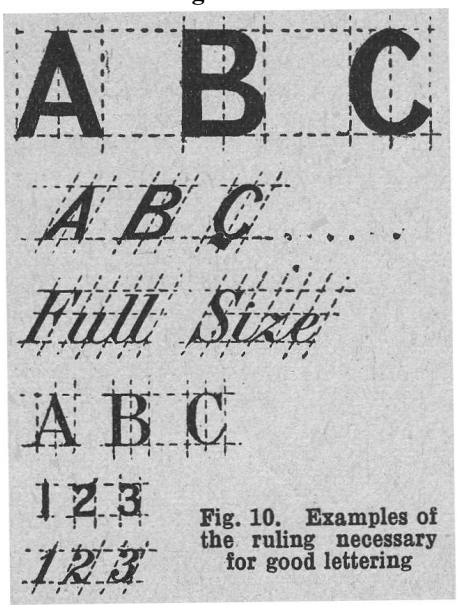


Fig. 10. Examples of the ruling necessary for good lettering

When a drawing has to be copied, it is as well to make the finished drawing on tracing paper or linen. This is pinned over the pencil drawings, and wiped over with French chalk to clean the surface. Subsequent work is performed as if on paper, the pencil lines showing through the tracing cloth and acting as a guide. When completed, blue prints or black line prints on white paper can be obtained by sending the tracings to a firm of photo-engravers, or the amateur can make his own sun prints in favourable weather.

DRAWING ROOMS IN SEVERAL STYLES

Suggestions for Furnishing and Suitable Colour Schemes

For related information see Chair; Colour; Decoration; Furniture, and for details about accessories Curtain; Cushion; Mirror, etc. See also Carpet and the entries on various styles, e.g. Adam; Chippendale; Queen Anne, etc.

There is a certain formality which distinguishes a drawing room from the ordinary living room and from the lounge. At the same time, except in a big house where there are four or five recreation or sitting rooms of different types, a drawing room should have a lived-in aspect and express to some extent the personality and taste of its owner, so that it does not look merely a room set apart to entertain visitors.

Perhaps one of the best things noticeable in many modern drawing rooms is the tendency to do away with overcrowding, not only of furniture, but also of superfluous ornaments, pictures and cushions. Things have a meaning and a definite place in the scheme. Small tables instead of being dotted about the room are

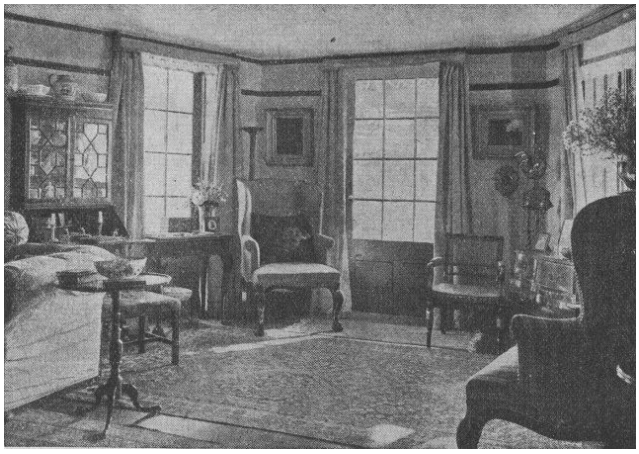
produced as required from a "nest" of four; the larger occasional table is often a useful book table. Comfort is still ensured by the inclusion in the furniture of a good settee or Chesterfield, and one or two lounge chairs, supplemented by several newer types of chairs designed to take up little space and yet for ease. If a piano, music stool, bureau or writing-table and bookcase are added the essential furniture is collected. Niches with shelves for china are always delightful features in a drawing room, while a recess provided with shelves is an excellent place for a gramophone. The records are kept in neat compartments on the under shelves and the gramophone on the top one about three feet from the floor. It is thus both easily got at and out of the way should the room be required for dancing. A light fitting should be placed conveniently for seeing the records. In small rooms the piano sometimes has to be omitted.

Whatever the furniture already possessed may be, it can usually be improved by good choice of furnishing fabrics. When starting to redecorate, renovate or furnish a drawing room take a view of the whole of its possibilities and determine the essential things to be done or bought, and the styles and colours needed to enhance it. This method precludes buying a carpet merely because it is a good bargain, a piece of furniture that is not in accord with others in the room, or picking up cushions at a sale merely because in themselves they are pretty. Such haphazard methods have spoilt many rooms that could have been charming with far less money spent on them than was lavished to produce an unsatisfactory medley.

Country House Drawing Rooms. A drawing room in the country is often simpler in treatment than the one in a town house. Freshness and the happy nature of the colour scheme will make up for a mixture of styles in pieces of furniture. Loose covers rightly play an important part in the scheme of such a room. If they are to be of a patterned cretonne, it is useful to remember that the larger the room the bolder can be the nature of the design on the fabric, but that such a design requires a plain setting. An attractive idea is to have the curtains of the gaily printed material and the covers in plain linen. This looks particularly well in a room where the windows are a feature.

A charming scheme for a sunny drawing room, which boasted no beautiful architectural features except a well-proportioned group of outward swinging casement windows, was evolved from a colourful cretonne used for the short curtains and box-pleated valance. The ground of the cretonne was dark smoke grey with large bunches of old-fashioned flowers multi-coloured, but with pink and red rose shades and the green of the leaves predominating. A grey wallpaper was chosen with a faintly suggested brocade pattern in an oyster shade. The paintwork was carried out in the latter colour except for the architrave of the door and its panel mouldings which were the deep grey of the cretonne ground. The settee was upholstered in dark grey velvet, but for the chairs, loose covers with box pleated frills were made in leaf green linen, which also lined the curtains. A panel of embroidery, glazed and framed in a narrow grey moulding, was substituted for an ugly overmantel, the only ornaments on the chimney shelf being a pair of Sheffield plate candle-sticks and one piece of old ruby and white glass. The owner of the room had housed any china ornaments in a big corner cabinet where they made a pleasant piece of decoration and were out of the dust. Cushions and shades discreetly repeated the colours in the cretonne, and the scheme was further bound together by a modern grey pile carpet into the border of which lighter grey, dull rose and leaf green were pleasantly introduced.

Another charming scheme is illustrated in Fig. 1. The Persian pattern carpet and the parquet surround would harmonize delightfully with beige walls, the satin curtains in a golden tone and lined with the shade of chestnut brown chosen to emphasise the frieze and cornice mouldings. The furniture is in Queen Anne and Chippendale styles. Loose covers should be made without frills to show the graceful cabriole legs of the armchairs. A glazed floral chintz with a deep cream ground would be a good choice for such covers. A few pieces of old brass lend their charm to this warm colour scheme which could be further enhanced by peach-coloured shades.



Drawing room. Fig. 1. Scheme for the drawing room of a country house, the prevailing tones being beige, gold and brown. The two long windows and the glass door into the garden, let in plenty of light and sun.
(Courtesy of Our Homes & Gardens)

Town Drawing Rooms. The small drawing room in a flat can be treated delightfully in formal fashion. Quite often—except in modern buildings—there is a tendency towards Adam style in designs of doors and chimney pieces, more or less suitably adapted to unpretentious rooms. As a rule this has to be made the best of, as structural alterations are impossible during a three-year tenancy. A successful method is to paint the walls a suitable pale colour and simulate panels with applied mouldings. Such a scheme forms a good background for most furniture whether of modern, antique, lacquer, painted or reproduction varieties. A ceiling paper of silver is a highly decorative finish if the

furnishing of the room permits it.

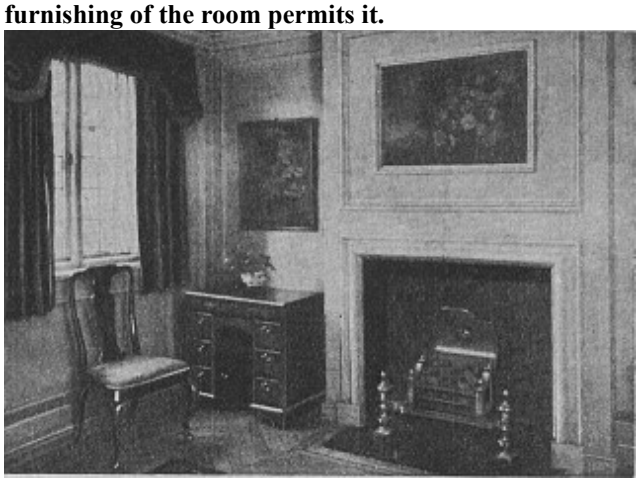


Fig. 2. Corner of a town drawing room. The furnishing and decoration are based on a dignified yet simple Queen Anne style enhanced by flower paintings. (Courtesy of Hampton & Sons, Ltd.)

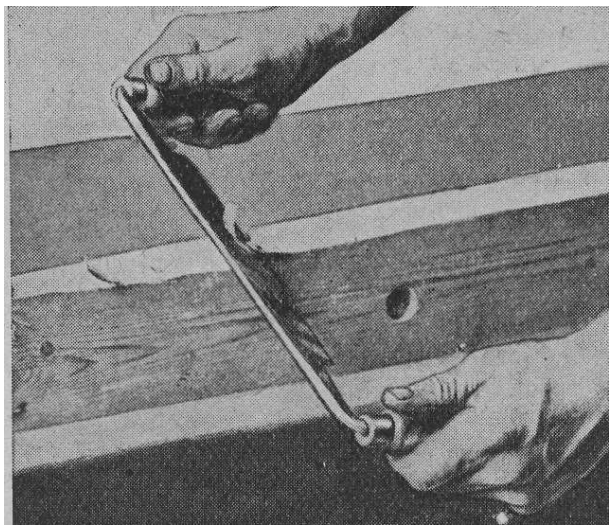
A Pleasing Colour Scheme

Another scheme which is pleasantly noncommittal is to distemper walls and ceiling a clear pale yellow or in flesh pink, paint the woodwork in a cold sea green picked out with silver, have a settee upholstered in a deeper shade of the same green in damask or heavy moiré; repeat this colour also for the curtains, the pelmet for which is trimmed with silver braid and fringe. Loose covers for the chairs would be in a cretonne with a pale green ground patterned in a small conventional design introducing pink and yellow. A carpet of modern pattern in which the predominating colour is green might be used or one of plain green pile. Tiles which are not harmonious in colour can be toned to suit the woodwork. Waxed walnut furniture with one lacquered or painted piece and a floor standard lamp in the sea green colour would look particularly well in such a room, but the scheme is not one that necessitates any particular style in furniture.

For a town house drawing room the simple Queen Anne style, illustrated in Fig. 2, could be carried out without great expense. The curtain treatment would be beautiful in plum-coloured silk with dull gold trimming. The carpet could be an oriental one introducing plum colour and old rose shades, the upholstery a modern silk tapestry in which the colours of the carpet are blended with a gold thread running through the design, and the walls are painted a soft apple green, while the ceiling is a pale gold colour. The panelled flower painting over the fireplace and the gold net glass curtains brighten the room.

A contrast to this room would be one in which the scheme was based on a biscuit, fawn and pink wallpaper of classical design. This could be completed by a light brown pile carpet unobtrusively patterned in fawn, taffeta curtains shot with pink, fawn and gold, and loose covers made of a shadow tissue in which these colours blended with a soft blue. Either oak, mahogany or walnut furniture would be at home in such a room.

DRAW KNIFE. This is a tool used by carpenters for roughing out along the grain. It consists of a heavy blade to which two wooden handles are fitted and riveted to prevent them being pulled off in use, the blade being ground to a chisel edge. When using a draw knife the operator stands astride of the wood to be cut and, holding the knife by the two handles, draws it towards him along the wood, while keeping the blade at an angle to the wood. The result is to draw off massive shavings slowly and steadily. The action should be one of drawing, not chopping, though chopping has to be resorted to when cutting through knots in the timber.



Draw Knife used in roughing out timber.

DRAWN THREAD WORK. This work is mostly executed on linen of an open weave, which allows the threads to be easily drawn, and is suitable for afternoon teacloths, table centres, and all kinds of house linen. The soft canvases used for duchesse sets and sideboard runners, and also crêpe-de-Chine, georgette and satin dress materials can be decorated with drawn thread work.

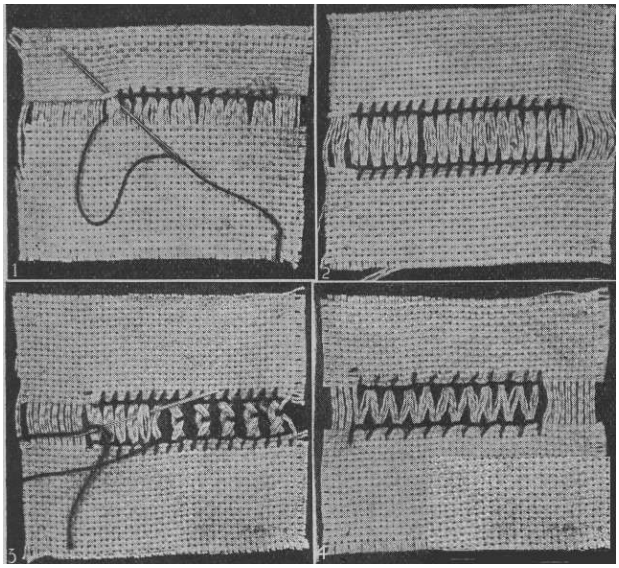
Modern drawn thread has many additions in the way of fancy lace stitches, from which have evolved the beautiful designs seen on the corners of tablecloths. In its initial stages it began with punto tirato, threads drawn one way of the material, then punto tagliato, threads drawn both ways so that they cross, and these were followed by opum tiratum, the fancy stitches worked on the loose threads.

The outlay in materials is small, as, apart from the material, working thread, crewel needles and a sharp pair of embroidery scissors are the only other things necessary. The thread should be about the same thickness as the ravellings of the ground material, and it can be either embroidery cotton or flax thread sold in small skeins for the purpose. Very elaborate work is best done on a special frame, but for small corners an ordinary round embroidery frame is sufficient, while the long rows can be worked over the left fingers.

The first stitch in this work is simple hemstitch. The hem itself will vary in width according to the article, and this must be measured off exactly before drawing

the threads, which come immediately under the folded hem (Fig. 1). If a single thread is drawn exactly where the hem is to turn at the top and about ¼ in. from the edge for the little turn up, a perfectly straight and flat hem will result. Join the thread just under the hem and bring it through to the right side. Pass the needle from right to left under three or four threads, according to thickness, and draw the thread through. Insert the needle in the same place and bring it up again through the hem just above the place where it was brought out before. Insert the needle under the next three threads and repeat, Fig. 1. Fig. 2 shows the hemstitch used as an insertion.

Fig. 3 gives the pattern of a single crossing evolved from Fig. 2 after hemstitching both edges. The clusters of threads are crossed thus. Put the point of the needle from left to right under the second cluster, then let the point travel from right to left under the first cluster, still keeping the second cluster under the needle, and bring the needle up to the left of the first cluster. Repeat along the line, turning every second cluster over the preceding one, and this will give a running thread through all the clusters, Fig. 3 shows the needle in position for beginning this stitch. Fig, 4 depicts trellis hemstitch. Hemstitch one edge as at Fig. 1, but when doing the opposite edge take half the strands from one cluster and half from the next.



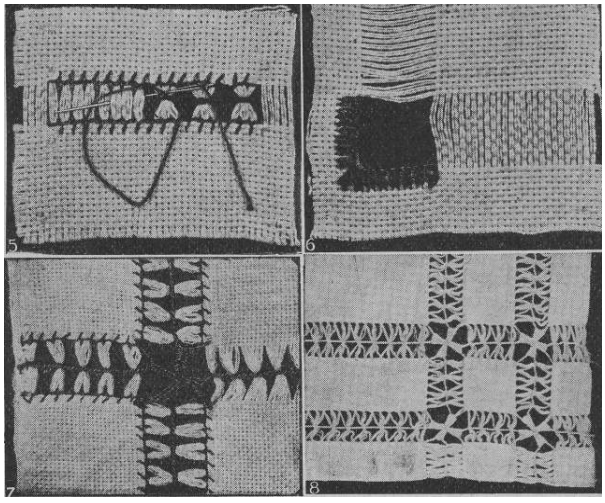
Drawn Thread. Figs. 1-5. Simple and more involved forms of hemstitching.

The Faggot-Stitch. Fig. 5 introduces faggot-stitch and the punto tirato knot. The latter is used largely in the most beautiful drawn-thread designs. Prepare the hemstitch insertion as in Fig. 2, then three or four clusters are bound together with the knot, when they resemble faggots of wood. The thread should be joined at the end of the work, or where there is not a hem it can be tied to the first three clusters to make the first faggot.

The knot resembles chain-stitch in embroidery with a slightly different placing of the needle. Take sufficient length of thread to do the whole length of insertion.

Now, working down the line of insertion, turn the cotton towards the left and hold it down with the left thumb; bring the point of the needle over to the left of the cotton held down and insert it down the upper part of the space between the faggot just tied and the next faggot. Pass it behind the three clusters that will form the next faggot and bring the point up over the cotton that is held down by the thumb. Draw the needle through with sufficient tightness to bind the faggot and let the thread lie in a straight line between the faggots. Fig. 5 shows the accurate position of the needle and thread, which is very important.

Fig. 6 shows how to finish a corner so that the threads are not drawn right to the hem. Buttonhole the two outside edges of a square along exactly the number of threads that will be drawn on each side, then cut the threads under the pearl edge of the buttonhole stitches and draw out the threads on both sides, when a square hole will appear, as in Fig. 6. This can be filled with a fancy pattern as in Fig. 7, or with the spider web. Fig. 7 shows a corner where two insertions of faggots cross each other. The working thread crosses the square hole from both sides, then two other threads are laid obliquely across these from corner to corner and secured firmly on the linen. Now join a new working thread in the very centre of the star of threads and work point de reprise under two threads, a corner one and a side one. This stitch is like simple darning-stitch and goes over one thread and under the other until the spokes are nearly covered.



Figs. 6-7. Stages in working the drawn thread work corner shown in Fig. 8.

Point de reprise forms the groundwork of the most beautiful drawn-thread designs, where a large number of spokes are laid and the stitch darned in and out all the threads according to formation of design. A spider's web can be worked on the spokes by weaving round and round the threads, taking care to keep them flat against each other so that they do not overlap. Fig. 8 shows a completed centre with two rows of faggot insertion and point de reprise fillings at the corners. In this case the threads are drawn right to the hem of the cloth. *See* Embroidery; Linen; Tablecloth, etc.

DRAW STRING. A draw string of tape or ribbon may be slotted through a casing or hem, and attached in the middle to prevent its being accidentally pulled through the slot too far. A double draw string is often used where fullness is only required for a few inches, or in drawing up bags, etc. Two lengths of ribbon tape or cord are used, one being attached at one end only, the other at the opposite end, and threaded through the slot; the two loose ends drawing up easily and evenly.

DRESDEN CHINA. The best period of Dresden china, which is porcelain made at Meissen in Saxony, extended from 1720 to 1775, and the mark is the famous crossed swords in blue under the glaze. To this period belong the breakfast services and other useful wares, with moulded decorations, painted on mauve, yellow, green or marone grounds, with tiny landscapes or flowers. Of the figures and groups, the best are in white, but those with painted decorations are much favoured. There were a1so clockcases, mirror-frames, cabinet-panels, tables, candelabra, and other furniture accessories.



Dresden China. Coffee-pot painted with Watteau subjects, c. 1760.

During the 30 years preceding 1814, called the Marcolini period, marked with a star beneath the crossed swords, the pieces show a somewhat classical taste. After that time the old moulds and marks were frequently copied, but never equalled. Many pieces were sold in the biscuit state, this being indicated by a nick across the swords; so that any painted decoration upon them, when so marked, must have been done elsewhere. The present factory, whose fabric is in a different clay and glaze, still possesses many of the original moulds, and uses the original mark. Painted with flowers, tea, coffee and dessert services are among the best examples of modern Dresden.

Thousands of counterfeit pieces have been produced. About 1880 a Dresden firm adopted a mark comprising a cross-tipped crown and the word Dresden. This so-called Crown Dresden has no historic value, such as that which pertains to Crown Derby. *See* China.

DRESSERS FOR DINING ROOM AND KITCHEN
The Welsh Dresser and other Kinds Described and Illustrated

See further Dining Room; Dining Table; Kitchen, and the articles on the woodworking processes involved in making one of these articles of furniture, e.g. Amateur Carpentry.

The dresser developed from the buffet, and took its present form soon after 1600. Oak was used for most of the early ones, but afterwards mahogany became popular and fine specimens were inlaid with box and other woods. The piece of furniture known as the Welsh dresser is made of oak and mahogany combined.

The plain kitchen dresser of deal, with its drawers and cupboards and unbacked superstructure of shelves, is a fixture, whereas the dresser which is sometimes substituted for the sideboard is a movable piece, and the shelves of its upper part are backed with plain wood or panels, and very often enclosed in order to keep the dust off the china that may be stored there. Some attractive modern dressers or built-in sideboards are made with glazed doors at the top, arranged either to swing or slide, as well as the cupboards and drawers in the lower portion. The unenclosed super-structure is most common; but there is always scope for the architectural treatment of the dresser, and both parts of it may be elaborated up to a certain point without diminishing its usefulness. The chief difference between old and new is in the material. Mahogany is now too expensive a wood for most people. Weathered oak has largely taken its place, and the cheaper woods, stripped and wax polished or stained, often give good results.

Where a dresser is intended for the display of good china, the shelves should be lightly grooved for the plates and saucers. A few good pieces carefully arranged will show themselves and the dresser to the best advantage.

The real Welsh dresser is easily distinguishable from the many faked ones on the market. The wood is oak, frequently with a simple inlay of mahogany, dark polished, with severe rectangular mouldings, and there should be plain brass droppers for the drawers.

One is constantly seeing examples, alleged to have been restored, with dark oak stain on the wood, curved Queen Anne legs, curved mouldings, or Sheraton shell ornament on the panels, and other contrivances designed to bring them into line with the popular conception of the period. In a good many cases the restored Welsh dresser is simply built up on an English foundation, with top back panels supplied from Victorian church pews. A useful test, though not, obviously, an infallible one, of genuineness is the condition of the brass furniture. The brass in a genuine antique will have become browned by the passage of time. Drawer handles looking like new should, therefore, be suspected. Many good furniture makers construct reproductions of period dressers, copying detail with artistic precision, or modern types are designed in limed oak.

Making a Deal Dresser. The particulars of a dresser given here will apply to any length up to 6 ft., and any reasonable height up to 7 ft. 6 in., in which case an extra shelf might be fitted.

For present purposes the dimensions are put at 3 ft. 6 in. wide. Depth back to front can be between 1 ft.

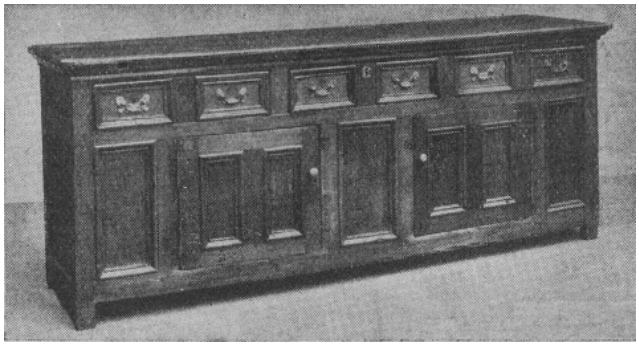
~~*(Continued in page 699)*~~



DRESDEN CHINA: SELECTED EXAMPLES FOR THE COLLECTOR

1. Pluto and Cerberus (1740). 2. Monkey musician (1750). 3. Cupid and Psyche (1760). 4. Girl's figure (1745). 5. Scaramuccia and Colombia (1760). 6. Cockatoo (1750). 7. Teapot in Chinese style (1730). 8. Vase (1750). 9. Barbara Utmann (1750-60). 10. Musician (1750). 11. Vase (1750-60). 12. Figure of Europe (1750). 13. Centre-piece (c. 1745). 14. Satirical group (1765). 15. Child's head (1770). 16. Bird on nest (1750). Vase (1750). 18. Court Fool of Saxony (1741). 19. Elephant. 20. Circassian (1740-50.) 21. Vase (1735). *See pp. 434 and 696.*

6 in. and 2 ft. Common deal will answer all purposes.





Dresser: two antique examples of this piece of furniture. Above, enclosed dresser of Sussex make, with drawers and cupboards. Right, old Welsh dresser, with panelled back, cupboards and drawers (Courtesy of Waring & Gillow, Ltd.)

The legs, from 3 in. by 3 in. material, are 3 ft. long. The top side rails or ends are double mortised into the legs and are 10 in. wide, finishing flush with the bottom of front bearer rail. The end may be cut to extend from top to bottom by those who desire entirely to enclose the lower part of the dresser.

The top front rail is dovetailed into legs as at C, Fig. 3, and finishes from 3 in. by 1 in stuff. The bearer rail enters the legs with a couple of tenons each end, and is of similar width and thickness. The top back rail (D) is of equal width and thickness with the ends, dovetailed into back of legs and screwed, with a matched back of ¾ in. stuff fitted to the lower part, as shown by dotted line at Fig. 2.

The division rail (G) between drawers is cut with two tenons right through the top front rail, and one through the bearer rail, and is 3 in. by 1 in. by 10 in. long. Between the front bearer rail and the back rail a 3 in. by 1 in. piece (E) is tongued and dovetailed respectively (Fig. 3). Upon this piece the drawers run backward and forward, the division rail being extended by glueing and nailing on a 1 in. by 1½ in. slip to form a guide (F, Figs. 2 and 3), so that all slides in line. A similar runner with guide is needed at each end. In assembling, dovetail and screw into under edge of back first, then the tongue on E should enter bearer and the dovetails on back enter legs simultaneously. Below, the legs are stiffened by stout rails tenoned in as H. These rails can be 3 in. wide, and upon them the pot-board, notched to fit round legs, will get a level bearing.

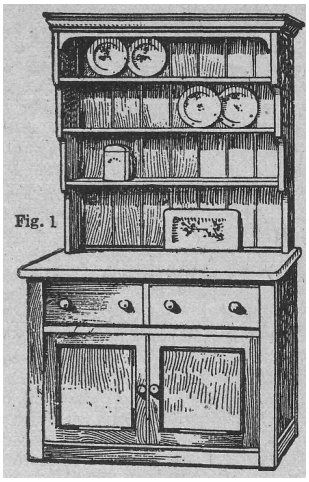
For the doors, stiles and rails, 2 ¾ in. by 1 in., mortised and tenoned together and grooved or rebated for ⅝ in. panels, should be got out. The opening for panels is indicated at Fig. 1 as with a ⅝ in. mould dropped in on face as a finish. The drawers should have 1 in. fronts, ⅜ in. sides and backs, and ¼ in. bottoms. The dimensions are given in the cutting list. The construction of drawers is clearly explained in the article Drawer (q.v.). Either wood knobs or cup handles in iron or brass can be fitted.

The upper ends or sides of the dresser, from 6 in. to 7 in. wide at top and shaped as Fig. 1, are cut back ¾ in. below each shelf to 4 in. wide at bottom, where they drop into grooves in the top. In marking the heights of the two or three shelves, first measure the plates and dishes, or any other items that have to be mounted. Usually the lower shelf is at least a foot above the table top, the others graduated in space as necessary. The stop for plates on edge is formed by lengths of ¼ in. bead cut to butt between the ends and panel-pinned to the shelves, so that they ensure a safe angle when the plates are tilted. These shelves are fitted into corresponding grooves in the ends, each groove being stopped back ½ in. from the front edge and the shelf corners notched to agree.

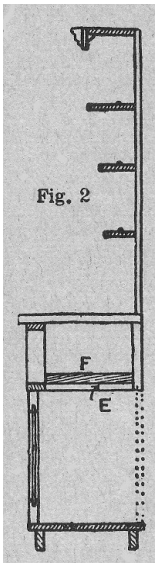
	Long ft.	Long in.	Wide in.	Thick in.
1 top	3	6	20	1¼
4 legs (A)	3	0	3	3
2 ends (B)	1	8	10	1
or	3	0	10	¾
1 top rail (C)	3	4	3	1
1 back rail (D)	3	4	10	1
1 runner (E)	1	8	3	1
2 end ditto	1	8	3	1
1 guide (F)	1	6	1½	1
1 division (G)		10	3	1
2 bottom rails (H)	3	4	3	1¼
2 ditto (ends)	1	8	3	1¼
1 pot board	3	4	19	1
DOORS.				
4 stiles	2	0	2¾	1
4 rails	1	6	2¾	1
2 panels	1	6	14	⅝
DRAWERS.				
2 fronts	1	6	9	1
4 sides	1	6	9	⅜
2 backs	1	6	9	⅜
2 bottoms	1	6	18	¼
1 shelf	3	0	16	1
UPPER PART.				
2 ends	3	6	7	1
3 shelves	3	4	7	1
1 top	3	9	9	1
Mould	6	0	3	1
Face rail	3	6	4	¾
Back, matching	3	6	42	¾

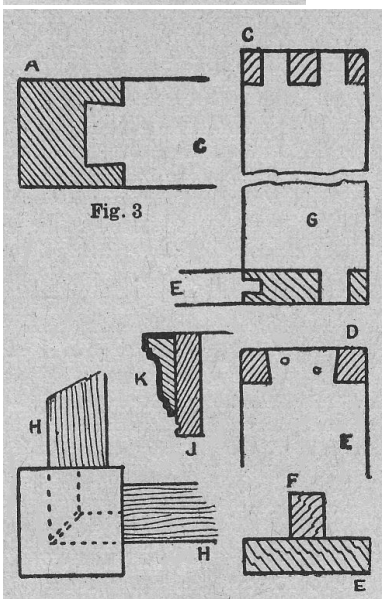
A face piece (J) is cut into the front edges of ends at top, and upon this the cornice mould will bed as at K, Fig. 3. The mould, a 3 in. by 1 in. section, is mitred to

return round ends. The face piece can be cut 5 ½ in. wide, and shaped as Fig. 1 to ease the line. A back of ¾ in. matching is best. A length of ¾ in. mould, cut to butt between the bottom parts of ends, makes a good finish. Brass dresser hooks of suitable size for the safe hanging of jugs are obtainable. A cutting list for the 3 ft. 6 in. size is given. Lengths and widths allow for joints and paring, but thicknesses are net.



Dresser. Fig. 1. Simple dresser fitted with shelves, drawers and cupboards. Figs.2-3. Side elevation and diagrams showing how the pieces are fitted.

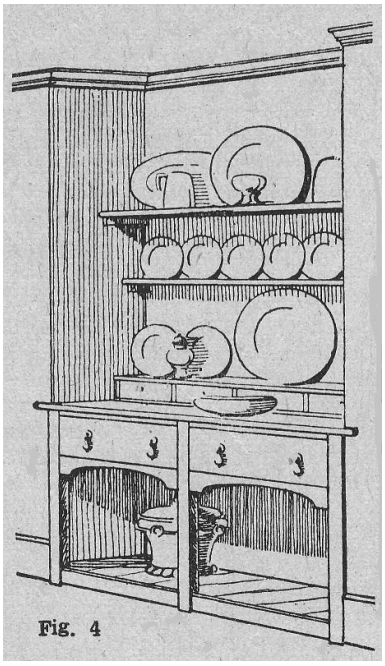


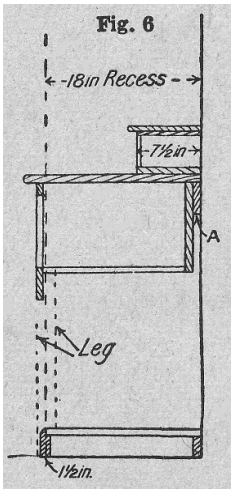


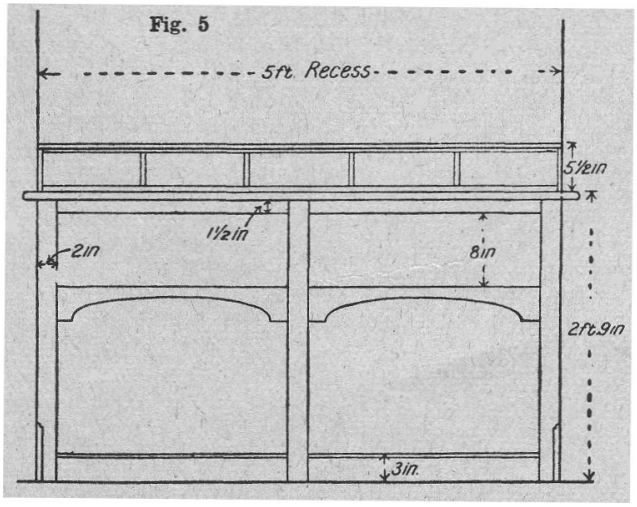
Dresser for a Recess. Fig. 4 depicts a dresser fitted to a recess 5 ft. by 18 in. The main face of the lower part, i.e. the legs and drawers, etc., stands forward 1 in., and is fitted with a set of drawers at the back. Fig. 7 shows the ends made flush with the inside faces of the legs, so that irregularity in the sides of the recess will not make a difference to the fitment. A batten nailed to the wall (A, Fig. 6) gives ample support. The top rests on the batten and is nailed to it. The legs, cut from 2 in. squares, are mortised for the front rails and the ends. These latter are rebated for the back (Fig. 7). The front rails are cut from 1 in. stuff, except the bottom which is 1½ in.; this is also rebated, as in Fig. 7 to take the pot-board, and bevelled at the front.

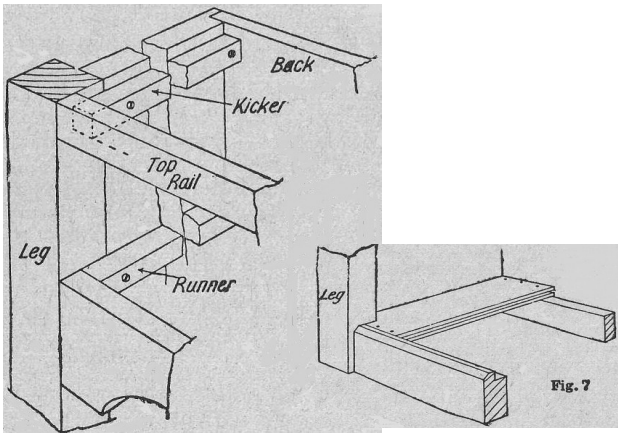
Glue the ends up first, then clean the inner surfaces and glue the front, lastly fitting in the back, which is glued and nailed. Now fit the job in position; it will be necessary to scribe the legs over the skirting. Having fixed the carcass to the batten (previously secured), the top is cut out and nailed down. This projects at the front round the walls. The potboard is best made from matchboarding, and is held at the back by a batten (Fig. 7).

Dresser. Fig. 4. Useful dresser made to fit into a recess. Figs. 5 and 6. Front and side elevations. Fig. 7. Diagrams showing details of drawer runners and bottom.









Drawer runners and kickers are fixed as in Fig. 7, and the drawers made. The set of small drawers at the back of the top are made separately and screwed to the

top. The carcass for these takes the form of a box rebated together, with drawer divisions grooved in. The shelves above, grooved or provided with stops to take the plates, are supported by bearers nailed to the wall. They should be nailed down on to the bearers.

DRESSING: What to Wear. Being well dressed is largely a matter of personality-it does not necessarily call for a great deal of expenditure. A woman requires what is usually termed "good taste." In other words, she must have great discernment in order to observe the general trend of fashion and adapt or modify the changes in line, colours, etc., to suit herself. No woman should attempt to follow a fashion slavishly, regardless of whether it suits her or not. Nor, if she is naturally quiet and retiring, should she wear loud and ultra-smart clothes, for in these she will only feel obvious and uncomfortable, thus completely swamping her personality, whereas she should aim rather at expressing it. But in order to know how to adapt fashions to best suit herself, a woman must first know her limitations.

This means that she must criticize herself thoroughly before a mirror, and, after admitting all her good points, proceed to take stock of her bad ones—every trifling fault in figure, face, hair and skin. This is essential, for only by playing up to and emphasising her good points can a woman detract attention from the bad points, while at the same time minimizing the latter as much as possible. This taking stock of herself will enable her to determine her type, and dress accordingly. For instance, if she is of lean, rather angular build with severe features, she will be best advised to avoid all fussy clothes, frills, flowers and ribbon trimmings and choose instead clothes of a tailored style. Even her afternoon and evening dresses should be utterly simple in style, relying on the richness of the fabric and colours to express her character and dignity.

Men's Wear. The hard and fast rules which govern men's attire make for a standard level in their dressing. With the exception of some of the younger men who take a real interest in their clothes, and of a few who actually make suggestions to their tailors, every man's desire is to look exactly like his well-dressed fellow. Colour harmony of shirt, tie, handkerchief and socks is not to be despised. A morning coat and dark-striped trousers have a slimming effect, and so have all dark-coloured, smooth-surfaced materials, particularly those which are narrowly striped, for lounge suits.

Men can be suitably equipped for all ordinary evening occasions by the possession of one suit of evening clothes, a couple of white waistcoats, and a dinner jacket suit, white bow ties to wear with the first, a black bow for the last and, in addition, correct evening shirts.

Dressing to Help the Figure. There are certain well-established rules in dress with regard to the too tall and thin, or the too short and stout. The former can detract from their height by wearing materials with a horizontal pattern or stripe. By breaking the long line of a dress with a wide belt at the waist, a jabot at the neck, and fullish sleeves instead of tight ones. They can wear shoulder capes with great success, also large-patterned prints, boleros, and tunic dresses when these are in fashion. To them wide-brimmed "cartwheel" hats are most becoming, as also are loose, unbelted coats of the swagger type, from finger-tip to full length. If instead of wearing suits in one colour they have the jacket and skirt in two different colours, or even two definite shades of one colour, they will find that this appears to diminish their height appreciably.

With the too short and stout, it is, of course, the reverse. Although they should avoid too loosely cut or sloppy clothes, at the same time they should not have their things unduly tight, as this emphasizes the line of the figure. They should not have anything horizontal about the line or pattern of their dress. For them stripes and seams should run lengthwise, and printed patterns should be of the small, unobtrusive type, nothing flamboyant. The narrow V-necked or cross-over style of bodice suits them best, with long fitting sleeves unbroken by gathers or noticeably fussy cuffs. A line of buttons down the centre of the bodice or a narrow inset panel in a contrasting colour —these give height, as also does the princess style of dress or coat, unbroken by a waistline. As to colours, it is well-known that dark shades make for slimness. Black, navy blue, dark brown, plum-colour, dark grey—all these are good relieved by small touches of white, oyster, beige or a very pale shade of the basic colour itself, according to the wearer's taste and skin colouring.

Correct Clothes for the Occasion.

Having a thorough knowledge of the type of clothes that suit her best, a woman's next care should be to always wear the correct clothes for the occasion. This is perhaps the essence of good dressing. For day wear in town, light simple tweeds and woollens are, generally speaking, most suitable for cool weather, with medium heeled shoes and practical accessories. Heels can be higher and accessories more ornamental in the afternoon and evening, according to the material and style of the gown. For the country, for race-meetings (apart from the very fashionable ones), for golf, and motoring, rough tweeds are usually worn, and with them low or medium heeled shoes are considered good style, with simple accessories in tweed, felt, leather or suede, or any fabric that happens to be fashionable and appropriate.

Care of the Clothes. One of the most important factors in good dressing is the care of clothes. No matter how old a suit or dress is, provided it is cleaned and pressed regularly, it will always look stylish, and fresh accessories or lingerie touches will give it a new lease of life. White collars, cuffs, frilling, etc., should always be spotless, and for this reason it is wise to have these easily removable for laundering.

There are one or two other things that affect the look

of clothes in general. Posture, primarily. No matter how much money is spent on clothes, or however tastefully a person is dressed, the effect is marred considerably if the wearer walks with a round-shouldered slouch, or sits or stands badly. Also, the line of a perfect gown can be completely ruined by badly fitting undergarments.

A woman should call attention to whatever she considers to be her good points. First, she should express her personality by dressing to her type. Then, if she has particularly lovely hair, the colour of her clothes should subtly complement it. If her eyes are good, again she should play up to their colour. Similarly, if her hands are her best feature, she should always keep them exquisitely groomed, and wear only the very best gloves.

DRESSING: In Surgery. The term dressing is used in surgery for any material applied to a wound to cover and protect it and further its healing. A simple aseptic dressing, that is, one which itself is germ free, can be prepared by baking ordinary absorbent cotton in an oven until it is slightly scorched.

Whatever the material applied to a wound, a burn or other breach of the surface, it must be clean and it must absorb discharges. To provide for absorption of discharges it is usual to cover the wound, etc., with lint or gauze, and over this put a thick layer of absorbent cotton-wool or wood-wool. The dressings are then fixed by a bandage.

In the case of a clean wound it is desirable that the dressing should be dry, because moisture favours the growth of microbes; but where there is a considerable raw surface and it is desired to keep the dressings moist to prevent them from sticking into the wound, the lint or gauze is wrung out of an antiseptic lotion and covered with oiled silk or gutta-percha tissue, the latter being cut smaller than the area of lint to be covered.

The smooth side of lint should be applied to the wound, as the fluff of the other side tends to stick in the sore. Two useful kinds of lint are ordinary surgeon's lint and boracic lint. Useful gauzes are plain gauze, cyanide gauze, and iodoform gauze.

Among lotions which may be applied for moistening dressings are the following:

Carbolic solution	1 in 40
Lysol	1 in 200
Perchloride of mercury	1 in 2,000
Boric acid	1 in 30

See Bandage; First Aid, etc.

DRESSING CASE. Dressing cases for men and women are intended to hold the various toilet accessories and requisites arranged compactly so that they can be taken about easily when travelling. The case itself is usually made of leather of various qualities, and should be cared for as other leather articles. The sizes and contents vary. A typical case for a man measures 24 in. by 16 in. by 8 in.; that for a woman is somewhat smaller. The fittings are usually of silver but may be of ivory, enamel, tortoiseshell and gold or silver, or even of gold.

DRESSING ROOM. In small flats, the bathroom is sometimes arranged as a bath-dressing room. Furniture must be of suitable material to withstand damp, and clothes may be kept in the bedroom provided there is sufficient wardrobe accommodation. Failing this, room may possibly be found for a small wardrobe in the passage. Convenient wardrobes are devised containing space for hanging clothes, shelves, and a set of narrow drawers with glass doors, so that a man can see which drawer contains ties, which handkerchiefs, and so on. In the case of the dressing room proper a dressing chest or table must also be provided, but it is not usually necessary to have a wash-stand, as the modern house gives good accommodation in the bathroom. A small bed or a practical divan is often also included in dressing room furniture.

DRESSING TABLES: PRACTICAL AND DECORATIVE

The Choice and Construction of this Bedroom Piece

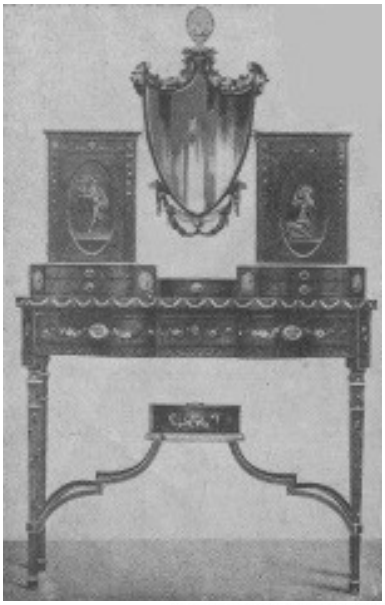
Other articles upon allied subjects include Bedstead; Chest of Drawers; Wardrobe. See also Bedroom; Bed-Sitting Room; Furniture; Table; and for the accessories Toilet Mirror; Toilet Set, etc.

In origin the dressing table was a table or chest of drawers used for toilet purposes, a mirror being placed upon it for assistance while dressing. As a distinct piece of furniture, it dates from the end of the 17th century. In the time of William and Mary and of Anne beautiful dressing tables were made in walnut and other fine woods. These were often fitted with drawers, and on them a loose swing mirror was placed. This style has been revived in the 20th century.

In the elegant styles for which the 18th century was notable, dressing tables are remarkable for grace of design and beauty of ornament. On them are found the various decorative features that distinguish 18th century furniture—the cabriole leg, for instance—while marquetry and inlay are frequently seen. These pieces are of rosewood, satinwood, and other rich woods, and they were designed by Chippendale and other great cabinet makers of the time, who made them also in mahogany. In some the mirror, either swing or triple in form, remained separate from the table, but more often it was fitted into the back.

Fig. 1 in the next page shows a finely decorated piece of the late 18th century classical period. It is of satinwood, with a bow-shaped front in which is a drawer. It is supported on slender legs connected by carved rods, at the junction of which is a box. Above the table proper are five drawers, and above these are two pedestal cupboards, between which a toilet glass shaped like a shield is swung. The beautiful design is enhanced by the graceful decoration of medallions painted on the cupboard doors and garlands of flowers

round the mirror. painted on the cupboard doors and garlands of flowers round the mirror.



Dressing Table. Fig. 1. Late 18th century example of the piece in satinwood. Fig. 2. Reproduction of a William and Mary dressing table, with triple mirror, in walnut. (*1, Victoria & Albert Museum, S. Kensington; 2, courtesy of Gill & Reigate)*



Fig. 2 shows an older example, being of the time of William and Mary.

It stands on twisted legs, strengthened by a stretcher. The mirror and the drawer handles should be noticed. Such triple mirrors are largely reproduced to-day, both framed and frameless.

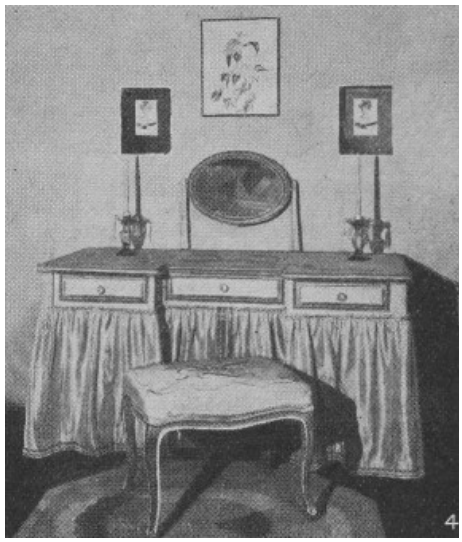
In the 18th century Sheraton, Hepplewhite, and other designers made dressing tables of the type that close up by means of folding doors on the top. The various partitions into which the well under the lid is divided were intended for combs, powders, patches, and other accessories demanded by the toilet of fashion. The glass, which is fitted into the well, rises on hinges in front and is supported by a foot fixed in the back. These articles were made in mahogany, but the cheaper woods also were employed.

In the 19th century the dressing table became an essential piece of furniture, but many of the tables manufactured in the latter half of the century are of poor design, especially those made to form pieces in bedroom suites of heavy so-called Victorian style.

Modern Dressing Tables. At the beginning of the present century the dressing table was nearly always bought in a suite of bedroom furniture, and was of the duchesse variety with mirror attached to supports rising from small drawers on either side. These were manufactured in designs based on Jacobean, Chippendale, Sheraton and other styles. While there are still many suites made in both modern and antique styles in walnut, mahogany, oak and other woods, and also in painted and lacquered furniture, separate pieces are often again preferred, knee-hole and drop-end tables are utilized with separate toilet mirrors, or the dressing table takes form as a corner or wall fixture. Extremes are seen in Figs. 3 and 4 of modern dressing table treatment, showing the severely plain and the daintily trimmed.



Dressing Table: two modern examples. Fig. 3. Space-saving suggestion for a small bedroom: it combines plenty of drawers with ample shelf room. Note use of cellulose and chromium handles. Fig. 4. Revival of a Victorian fashion in painted wood and taffeta. Any table of suitable size can thus be brought into a decorative scheme. (3, *photo, Margaret Currant)*



Note the utilization of all possible shelf and drawer space by an undershelf at right-angles to the main structure. It would be an excellent arrangement

for dressing table accommodation in a small dressing room or in a study bedroom. The other treatment (Fig. 4) is an example of a fashion revived from Victorian days. This particular dressing table is of painted wood. The curtain is made of art-silk taffeta to match the bedspread in the room, and trimmed with silver braid. The top of the table has a separate cover of the taffeta under plate glass. These petticoats for tables can be carried out in a variety of materials suitable for elaborate or simple furnishing schemes. With transparent fabrics, such as spotted and organdie muslins or voile, a separate lining of sateen is required. In country bedrooms chintz or cretonne dressing table petticoats may match the curtains. Such washable materials can be made up as complete covers with tops to fit the corners of the tables and the petticoats gathered on at a depth of about 6 in., or separate tops may be made edged with a 6 in. frill, the petticoat being attached to the table underneath the frill. Sometimes the petticoats have tiers of scallops, or three tiers of contrasting colours; as, for instance, three shades of rose pink voile on a pink sateen foundation.

One of the most attractive of recent designs which combine "period" characteristics with up-to-date ideas is the frilled and glass-topped design shown in Fig. 6. This includes the present tendency towards "kidney shapes" in mirrors, also curves, and a mahogany stool which goes well with furniture of various kinds.

Construction of a Dressing Table. A dressing table of the more usual type has two or more drawers with mirrors above. The general construction may be gathered from the article on Chest of Drawers (p. 394), which also describes a man's dressing chest with shaving mirror. When making a dressing table with framed three-fold mirror it is important that the stiles or uprights of all three mirrors should be marked out together, to ensure uniformity in size. The method of framing and fixing the glass is indicated in the article just mentioned. The centre mirror is hung with special brass movements made for the purpose, and the side mirrors are hinged with ordinary brass butts let into the mirror framing.



Dressing Table. Fig. 5. Modern design in figured oak with a frameless triple mirror (Courtesy of Williamson & Cole. Ltd.)

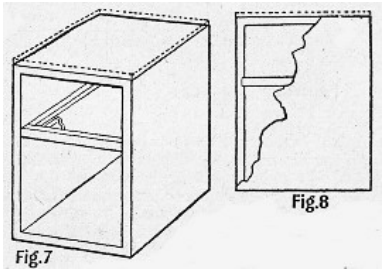
Frameless bevelled mirrors, as shown in Fig. 5 on the next page, lend a nice appearance to a dressing table, and are attached to ⅝ in. backboards by means of neat brass or plated clips screwed to the backboards themselves. The clips and other necessary fittings, with the movements for the centre mirror, may be obtained from a furnishing ironmonger.

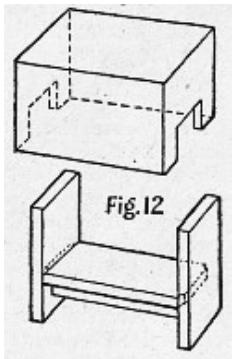
Pedestal Dressing Table. Fig. 6 shows a dressing table set composed of two pedestals and a stool. A tall mirror is fixed to the wall, and two useful bracket shelves complete the set. The pedestals have plate glass tops, and each contains two drawers. The mirror is illuminated by a tubular lamp fixed above it.

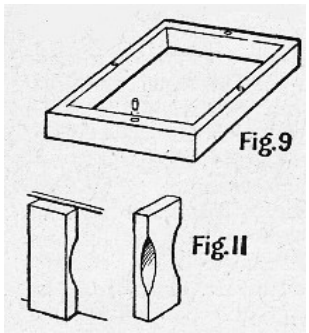


Dressing Table. Fig. 6. For a corner: this modern glass-topped table wears an old-fashioned frilled valance. Such tables are available with swivel hinges, swinging aside to reveal a washstand. (Photo, Margaret Currant Studio)

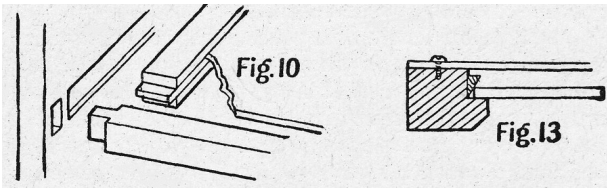
The construction of the pedestals is explained in Figs. 7 to 11, and the worker will find further information about joints and methods in such articles as Chest of Drawers: Drawer; Joint Mortise, etc. Fig. 9 shows the base, which stands in a trifle under the pedestal, the latter being held in position by blocks or stout dowels.







Dressing Table. Figs. 7-13. Diagrams showing construction of the pedestal dressing table set.



The stool (Fig. 12) comprises a stand and the seat proper. The latter is an inverted box fitting on to a saddle between the uprights of the stand. The seat must drop down low enough to be quite firm and stable. It is secured by screws from the under side of the saddle into a cross piece (not shown) fastened inside the seat box at the correct height, and resting on the upper side of the saddle. Allowance must be made for the thickness of the covering material, so that the seat fits tightly between the uprights of the stand.

The pedestals are 28 in. high by 20 in. wide and 24 in. deep. The base is 21 in. by 17 in. by 3 in. high. A suitable size for the seat of the dressing stool is 20 in. long by 15 in. wide by 12 in. high. The ends of the stool are 11 in. wide, leaving 2 in. of the upholstered seat showing at each side, The seat stands up about 4 in. above the stool ends. The pedestals might be made of 1 in. whitewood, the boards being glue jointed to the requisite width. The ends are dovetailed to the top and bottom, or in a simpler form of construction these parts might be tongued together. The drawer rail and runners are grooved to take a dustboard, the rail being tenoned to the end, as shown in Fig. 10. The runner is housed to the end, and enters the groove of the rail with a stub tenon. The back of the pedestal (Fig. 8) is of plywood.

The two drawers may be made up as described in the articles Chest of Drawers and Drawer, the relative depths being adjusted to taste. The handles are shown in Fig. 10. The mirror is 6 ft. by 2 ft. or so, and may be framed up in the manner described in the article on Cheval Glass. The method of securing the glass is shown in Fig. 13. The tubular electric light fitting may be obtained from any electrical dealer, a switch being fitted inconspicuously under one of the bracket shelves. A white or cream-coloured switch,would be suitable. Of course, one of the existing lights might be converted, when the switch in its usual position near the door of the room would control the mirror light. The mirror is attached to the wall with plated brackets and screws, utilizing rawlplugs.

The woodwork ot the pedestals, stool, mirror frame and bracket shelves should be cleaned off nicely and prepared for painting. One of the cellulose enamels would be eminently suitable for this job, tbe edges and details being finished in coral pink or delft blue, say, and grey for the ground. One or more coats of cellulose undercoating should be applied to the wood before the colour coat, and on an open grained wood a cellulose paste wood filler might first be employed with advantage.

A rubber-set brush must be used, as the solvent in the enamel will loosen the hairs of the ordinary sort of brush. The brush should be used in one direction only in applying the enamel, and on vertical surfaces the strokes should be from top to bottom, as far as possible.

DRESSMAKING. This requires a knowledge of the correct methods of cutting out and sewing together the various parts that make a garment, though the same main principles govern the making of all clothes.

With regard to cutting out the garment, which is often done with the aid of a paper pattern, it is necessary to know how to set each part of the pattern correctly on the material, so as to get the right hang to the garment.

Fitting and pressing are very important complements to sewing and making. For fitting purposes the garment is roughly put together in the first instance with temporary stitches, known as tacking, and, after the arrangement of other minor details, the garment is tried on the wearer for the fitting. The seams, at this stage, are adjusted to fit the wearer more correctly, and the exact length estimated.

After fitting the seams are fixed permanently, durable stitching replacing the tackings, while the pressing, finishing, and trimming are also done. Pressing in itself is a highly important factor, and can easily make or mar a garment. Various stitches are used in the sewing together of the dress. Simplest of all are the temporary stitches used at the first stage, these not only including tacking as just described, but also basting. The permanent stitching which replaces the tacking may comprise machine-stitching, running, hemming, gathering, over-sewing, catch-stitching, herring-boning, etc.

With regard to machine-stitching, it is very important that the dressmaker should have a thorough knowledge of the working of a sewing machine, as some models can be adjusted to do all kinds of stitchery, such as hemming, also decorative or trimming stitches; for example, tucking, embroidery, openwork-hemstitching, etc. The sewing machine, in fact, is one of the most important tools of the dressmaker. Others include scissors in two or three sizes, sewing needles in mixed sizes, pins, white and coloured tacking cottons, and ordinary sewing and machine cottons and silks, thimbles, buttonhole twist, an inch tape, pieces of tailors' chalk, flat irons, and an ironing-blanket; also a sleeve-board on which to press sleeves, and a skirt-board for skirts. Hooks and eyes, fasteners, etc., can be bought as required. A dress stand should be included.

How to Learn. As a business, dressmaking offers possibilities of a good livelihood, if a thorough knowledge of all its branches is acquired. In order to obtain this, the would-be dressmaker can enter a dressmaking firm as an apprentice, and afterwards pass through various stages, until she becomes a full hand, capable of working without supervision.

Another way of learning dressmaking is in trade schools. There are several of these in large industrial centres, such as the trade schools of the L.C.C. in London, into which a girl may pass directly she leaves school. In these she is taught every branch of the business, the course, when completed, enabling her to take a place in any house of business. Dressmaking classes are also held at various technical institutes throughout the country for those who cannot afford to give the time for an apprenticeship.

Anyone with an intelligent acquaintance with ordinary needlework will find it possible to make her own clothes at home, with the aid of the various fashion journals now on the market. These journals supply paper patterns of various garments, together with diagrams and instructions showing how to cut out in material and make up, while they often include in addition practical articles on various aspects of dressmaking. *See* Cutting-Out.

DRESS STAND. A dress stand is a frame of light wood, or wire, partly covered with canvas or drill made to the measurement of the figure, upon which a dressmaker drapes and fits a gown. Dress stands are to be bought in all sizes or made to order; those made in wire are sometimes partly collapsible and adjustable.

A stand padded to about 9 in. below the waistline is the most useful type for fitting on and moulding a bodice or coat.

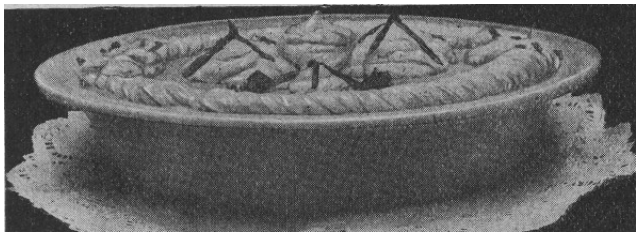
DRESS SUIT. This term is given to the suit of clothes worn by men at dances, dinner parties, and in the evening. Except for the waistcoat, which may be white, a dress suit is invariably of black cloth. *See* Dressing.

DRIED FRUIT. These fruits especially currants, sultanas, and raisins, constitute important ingredients in many kinds of puddings, cakes and fancy breads. Among the varieties dried are apples, apricots, figs, peaches, pears and prunes. Before use, these should be washed thoroughly and soaked for 24 hours in cold water. When they are ready to be cooked stew them slowly until tender in the water in which they have been soaked adding sugar to taste.

Fruit drying may be done at home without the aid of any special equipment, but if the result is to be successful the fruit must be perfectly sound. Apples should be peeled, cored and cut into rings, and if they are not to be dried immediately, immersed in 2 quarts cold water to which 1 oz. salt has been added, to prevent discoloration.

Pears, peeled and cut into halves, should be left in the same solution for 15 min., while, except for stalking, cherries, plums and damsons need no preparation, though the two last-named are better if pricked before being placed in the oven. The oven itself should be cool, and the drained fruit placed in it on an ordinary wire tray. In order that the fruity may not scorch, the temperature must be kept low and the fire not allowed to burn fiercely. The time of drying will depend upon the kind ot fruit used, apple rings requiring about 5 hours and halved pears a whole day. The smaller fruits will not take so long. *See* Compote; Currant; Fig; Prune; Raisin.

Dried Fruit Pudding. When fresh fruit is difficult to obtain, this pudding is specially welcome. Make it by washing 2 oz. each of dried apple rings, dried pears and dried peaches, and 3 oz. of raisins, cutting each of the peaches and pears into 3 or 4 pieces. Put all the fruit into a basin, cover it well with cold water, and leave it to soak for 24 hours. Then put it into a saucepan with the water in which it has been soaking. Add 3 oz. Demerara sugar, and cook the fruit until it is quite soft. Then put the fruit into a pie-dish, and continue to boil the syrup for a few minutes until it thickens. When cold, pour it over the fruit.



Dried Fruit Pudding. An attractive and useful sweet which can be prepared when fresh fruit is difficult to obtain.

Put a quart of milk into a saucepan over the fire, sprinkle in 4 oz. semolina, add the grated rind of a small lemon and 2 dessertspoonfuls granulated sugar, and cook all together until the mixture is soft and creamy, stirring it frequently to prevent it from burning. Leave it to cool slightly, then pour it over the fruit, but do not mix them together. Whisk together to a stiff froth 2 whites of eggs and 1 gill cream, fold into the mixture about 1 teaspoonful castor sugar, and then shake it on top of the semolina etc. finally decorating it with strips of ange1ica. If a plainer pudding is required, the cream and white of egg may be omitted.

DRIERS. Driers is the name given to a group of preparations used to ensure the proper drying of the fatty oils in paints and varnishes. Litharge (oxide of lead), minium (red lead), and white lead are those usually employed in commercial preparations. Care should be taken not to use them to excess. A safe proportion is 10 per cent of the total bulk.

Driers are sold by the colourman in two forms, liquid and patent driers. Liquid driers, known as terebine, have as a basis oils in which metallic salts have been boiled, and may be purchased ready mixed or prepared for use as required. Patent driers are sold ready ground in oil, and when purchasing it is as well to see that no brittle skin is formed on the top of the colourman's keg. This is an indication that the drying agent is too active, and the paint in which such driers are used will be spoiled. *See* Paint: Varnish, etc.

DRILLS AND DRILLING METHODS

Boring Tools for Use on Metal

This contribution is one of the group that includes Bent Iron Work; Metal Work. See also Bit; Boring; Brace; Chuck; Lathe; Rivet.

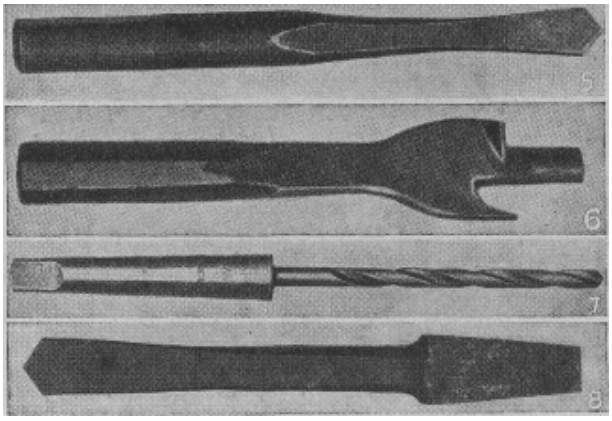
A drill is a small, sharp-pointed instrument with cutting edges, fixed in a stock which is revolved to pierce a hole in metal.

Drills are made in two chief grades, carbon steel and high speed steel, the latter removing metal faster. For

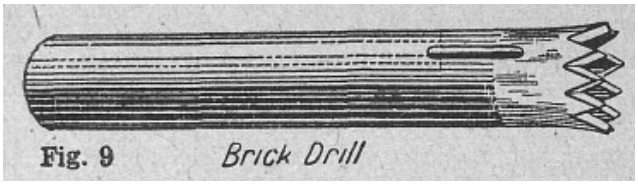
practically all ordinary amateur purposes the carbon is quite satisfactory, and costs considerably less.

For all-round use there is the twist drill, so named from the shape of the double helical fluting, made from 1/16 in. to 1 in. or more in diameter. For drilling holes in thin sheet metal and any holes in brass or copper, the straight fluted drill is preferable. The flat, arrow head, and diamond point drills are useful, especially in the larger sizes, for drilling holes with a ratchet brace, and are equally effective on iron, steel, or brass. They are also convenient for use in a lathe, especially those made from flat strip metal.

Expansion drills comprise a short twist drill fixed in a shank, and an adjustable cutter, for drilling large diameter holes in sheet metal, as when making holes in hot-water tanks, cisterns, and other household appliances. Centring drills are used to start the hole when intending to drill one of large diameter, and also to form a properly sloped centre on the end of a bar to be mounted and turned between the centres of a lathe. Pin drills have a central pin or pilot, which guides the drill while it counter-bores or enlarges a hole already drilled. The general form is shown at Fig. 5.



Drill. Fig. 5. Diamond point drill. Fig. 6. Pin drill. Fig. 7. Morse taper shank twist drill. Fig. 8. Flat arrowhead drill with ratchet brace shank.



Drill. Fig. 9. Diagram of drill made from iron gas barrel, for brickwork.

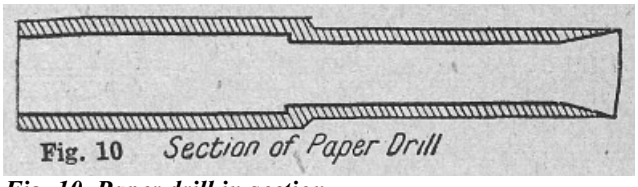


Fig. 10. Paper drill in section.

The limit of size that can be operated effectively with a hand drill is seldom over 3/16 in. to ¼ in. diameter. A breast drill will tackle holes up to 5/16 in. to ⅜ in. diameter; a small hand-power bench drilling machine will handle drills up to ½ in. diameter, and a powerful hand-power drill of the blacksmith's type will tackle work up to ¾ in. in diameter. A treadle drill will take up to this size, but for larger sizes a power-driven machine is required. Drills are purchasable in millimetre sizes, in letter sizes corresponding to the gauge sizes of wire, and in ordinary fractions of an inch, the latter being the best for general purposes. Very small drills are made for watch and clock work and similar delicate apparatus.

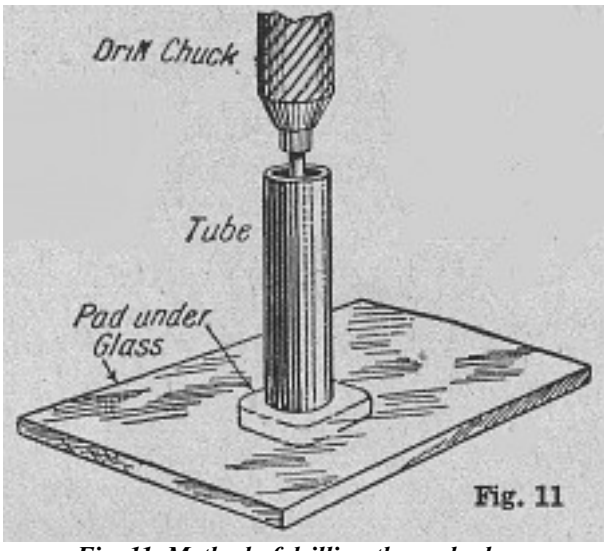
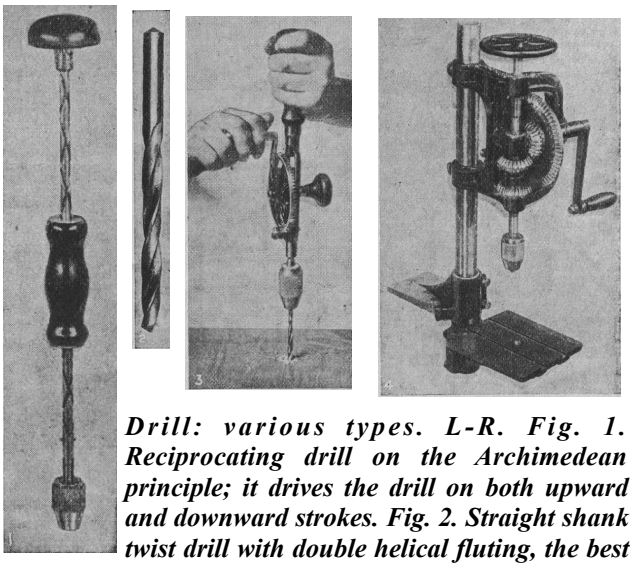


Fig. 11. Method of drilling through glass.



Drill: various types. L-R. Fig. 1. Reciprocating drill on the Archimedean principle; it drives the drill on both upward and downward strokes. Fig. 2. Straight shank twist drill with double helical fluting, the best for all-round use. Fig. 3. Hand drill in use. Fig. 4. Powerful bench two-speed drill.

There are a number of different types of stock, but the amateur may well do with a hand drill as illustrated at Fig. 3, effective up to ⅛ or 3/16 in. diameter holes. An example of a powerful wall or bench drilling machine is shown at Fig. 4. A reciprocating drill on the Archimedean principle (Fig. 1) drives the drill both on the upward and downward stroke, by having right and left hand threads formed

upon the spindle.

Having selected the right drill for the size hole, place it in the chuck and screw it up tightly. Next make a centre punch mark exactly on the centre for the desired hole. Then, using a hand drill, hold this so that the drill is perpendicular and in an axial line with the position of the hole (Fig. 3). Rotate the drill by turning the crank handle with the right hand, while keeping the drill and the stock in position with the left hand. Exert sufficient pressure with the left hand to make the drill cut properly; this will be evident from the turnings, which should curl up and away from the drill if working in steel or iron, or in the form of chips or powder from brass or cast iron.

It is necessary to hold the drill stock steadily, and to rotate the drill at the correct speed, which varies with the size of drill and the nature of the material. Using a ¼ in. diameter drill on steel, the speed would be about 300 revolutions per min.; on cast iron, about 200 revolutions; and on brass, about 550. Smaller sizes of drills should be rotated faster, and larger sizes more slowly. If the drill turns off nice clean chips or shavings, all is well; if not, try a different speed, with greater or less pressure on the drill. Drills should be lubricated with light machine oil while working, except on cast iron, which drills dry.

The Breast Drill. Breast drills are used in the same way, but pressure is brought to bear by leaning the weight of the body on the pad at the top of the stock, and holding the guide handle with the left hand. The work must always be held securely, as if the work moves the drill will almost certainly be broken. Drills should not be used to enlarge a hole that is only a little smaller than the drill, as the hole is then apt to jam or tear, or smash the drill. A reamer is the proper tool to use for this purpose. If a large hole has to be made, drill a small pilot hole first.

The correct shape of the cutting edges can only be maintained by accurate grinding. Essentials are that the angles of both cutting edges are alike, that their length is uniform, and that both faces slope back at the same angle. The use of a drilling gauge to test these angles is recommended, as well as an ordinary drill or wire gauge plate for testing the size of drills.

Paper is drilled with a tubular drill shaped as shown in Fig. 10. A serviceable drill for making holes in brickwork is made from iron gas barrel, shaped as in Fig. 9. Marble can be drilled with a twist drill.

Glass is drilled in several ways. A simple method is to take a piece of brass tube of the desired diameter and equal to that of the hole. Revolve the tube slowly, and use carborundum powder moistened with oil, applying the drill tube to the abrasive, which should be spread out evenly and thinly on a piece of wood, and not put on the glass. The glass must be supported on a felt or rubber pad only a little larger than the size of the hole. When possible, drill from one side halfway through, and then reverse the glass and drill from the opposite side. China and crockery are drilled with a steel point and diamond dust or carborundum as a cutting medium, or a diamond-tipped drill is employed for the purpose.

Drilling in a lathe is accomplished by holding the drill in a chuck on the mandrel, or by revolving the work and holding the drill in a chuck on the tail-stock. Flat drills are generally used in a special holder held in the slide-rest.

DRILL: In Gardening. The drill is a straight furrow, made in the soil, in which seeds are sown. It varies in depth from half an inch to 2 in., according to the size of the seeds. A wide, flat drill is usually made for large seeds, e.g. peas and beans, and a double row is sown. The distance between the drills depends on the height of the plants.

DRILL: Linen and Cotton. White linen drill, so much used for men's suits and riding-breeches in the tropics, owes its popularity to its coolness in use and a great durability which enables it to withstand frequent washing. Too substantial for dresses, it is excellent for hot-weather tailor-made costumes, and for boys' sailor suits. Blue drill is also obtainable.

Drill is more largely made in cotton than linen, and khaki cotton drill used for the troops in India and extensively for civilian wear in the Colonies, is serviceable also for summer wear in England. Solid and compact, drills are woven with twilled or sateen faces, and wear well, because of the strength and number of threads forming the surface. The closeness and solidity of their structure make them somewhat difficult to sew. Either cotton or linen drills make excellent pocketings, and remnants should be saved to that end. Certain lighter cotton drills, called drillettes, are made for this purpose.

DRILL: HEALTHY EXERCISES FOR CHILDREN

How to Secure Balance and a Good Carriage

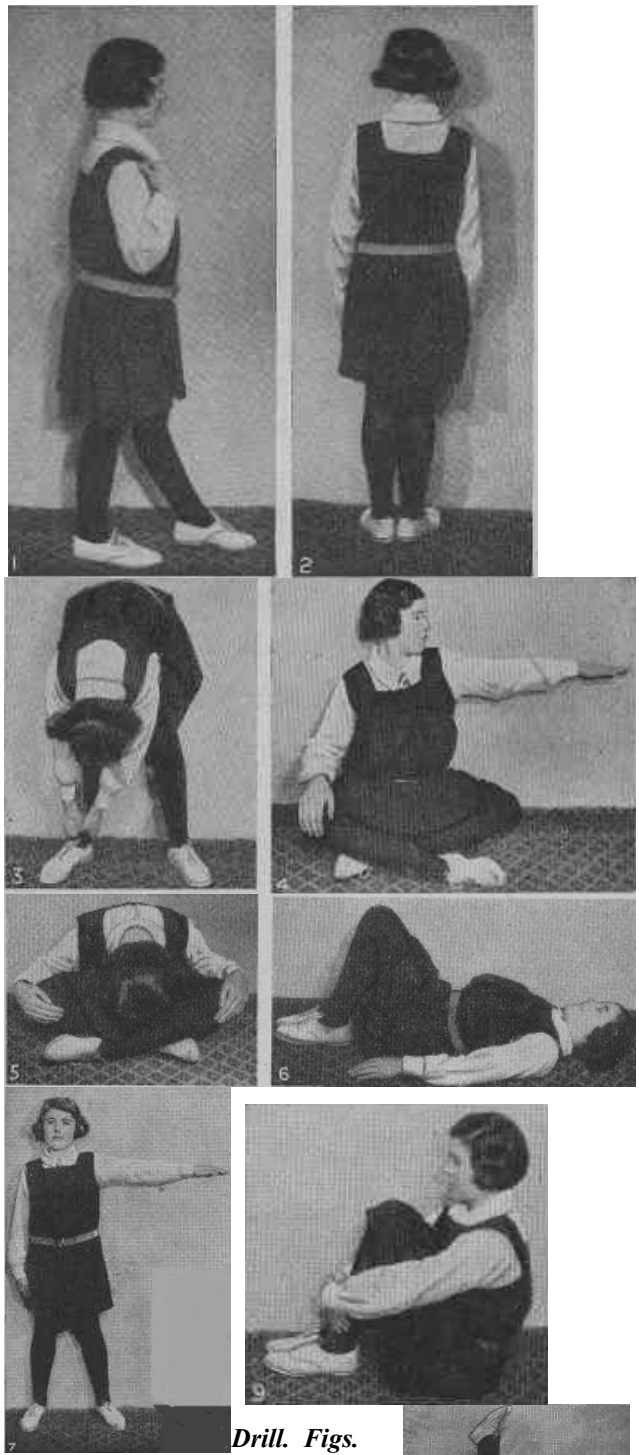
Other information on the important subject of physical fitness will be found under the headings Breathing; Exercise. See also Child; Diet; Food.

Suitable exercises keep every muscle in good condition, strengthening weak ones and making supple those which are tight. Girls especially suffer from weak abdominal muscles and very often those across the shoulders and the back of the thighs are too tight. Exercises also help to attain a perfect balance which is the secret of good deportment.

No child should be allowed to overdo these exercises, and they are best performed for five or ten minutes before breakfast. Those illustrated have been chosen because they give the maximum result with the minimum amount of expended energy. Hence their advantage over skipping exercises, for example, in which an enormous amount of energy is spent in lifting the body off the ground so frequently, much extra work is placed on the heart, while comparatively little benefit accrues to the muscles.

At school, exercises are usually performed to a rhythmic time, a piano being used, with the beats well

marked. But at home, it is quite enough to clap the hands while the child is getting into the rhythm, and afterwards it can be dispensed with, the youngster doing the counting. Naturally, this rhythmic time is not absolutely essential, but it will be found that it not only prevents the exercises from being rushed through, but gives a certain amount of grace to them as well. Also, a child enjoys doing a thing to rhythmic measure more than without this aid.



Drill. Figs. 1-9. Exercises for children designed to keep the muscles in good condition and to ensure good balance and carriage of the body.

Fig. 1 shows an exercise for developing balance. This is most valuable, not only for deportment but for exercising the muscles as well. When the child has become more efficient at balancing, the exercises can be performed with a book resting on the head. If this stays in position it is a proof that the balance is being strictly kept. Count two for each movement.

First, hands on hips and lift the left leg, pointing the toe; raise the leg and place the hands on the shoulders. Keep the leg raised and stretch the hands sideways. Lastly, lower the leg and hands, then feet together all in the one count. Repeat with the right leg. When balance has become more assured, while the leg is raised, the hands can be stretched forwards as well as outwards, making it a longer time on the one leg.

The last exercise can be followed up by the simple one of raising and lowering the heels (Fig. 2). This is especially good for the arch of the foot and for the foot muscles, and is also a corrective for flat feet. Count two for raising the heels and two for lowering, and repeat several times. Another exercise for the same purpose consists simply of "feet apart and feet together." Count two for each movement and repeat several times as in the last exercise.

Fig. 3 illustrates an exercise for strengthening the back and abdominal muscles. Such exercises, as has already been noted, are particularly important for girls, whose abdominal muscles are often weak. The first movement is feet apart with a jump, then with a swinging movement raise the two hands and lower them, taking hold of the ankle with both hands, as in the illustration. Next body upright with hands outstretched; then repeat the swinging movement, taking hold of the other ankle. Body upright again with hands outstretched, then bend, taking hold of each ankle with either hand. Lastly, straighten up, hands outstretched then down, jumping feet together.

The next exercise (Fig. 4) is for the neck muscles and for developing a good carriage for the head. The first movement is done in a sitting position with the legs tucked underneath, as in the photograph. Stretch out the first hand and look towards it, giving the head a smart turn and hold it erect. With the next count of two, place both hands on knees, now repeat the first movement with the other hand, taking care of the position of the head. Place hands on knees for the next count of two; now bend the head right down between the knees (as in Fig. 5), counting two; then up again, counting two. Repeat this three times, for this is the most important part of the exercise. Now stretch out the legs and stand.

If the child should tire at all during the exercises or after, she should lie flat on the ground with the knees bent and the legs as near to the body as possible, as in Fig. 6. It is an excellent position of complete resting, and should be used for a tired child even if it is not connected with drill.

The trunk muscles are most important and should be given a chance to be in good condition together with the other muscles. The exercise shown in Fig. 7 is quite simple, but it must be done smartly, with head erect

and back straight. This does not mean quickly; the count of "one," "two," is to be used in this, as in the others. First, jump the feet apart and place the hands on hips. Now stretch out the hand straight and turn it with the trunk backwards as in Fig. 7. Hands at sides and eyes front. Now repeat with the other hands, doing it to time, yet smartly. Hands at sides and jump the feet together. Repeat this three times.

Another exercise for abdominal muscles is the one illustrated in Figs. 8 and 9. This is rather more strenuous and should not be performed more than twice at a time. First lie flat on the back with the legs outstretched and the hands underneath the head, or at the sides, as shown. Now begin the counting "one," "two," raising the left leg upwards and pointing the toe. Lower leg to the count of two, then begin with the other leg, pointing toe upwards, then lower. Next raise the two legs together and lower. The last part of the exercise is to draw the legs up, placing hands in front, as in Fig. 9, then on the ground to raise the body. It must be remembered that some of these movements, such as the last one, are to aid the counting or the rhythmic effect. They are not really essential in the sense that they are conditioning the muscles. Each exercise has its share of both, the one helping the other.

With regard to drill costume, most schools have their regulation dress, which consists of a gymnasium tunic and blouse, such as is worn by the child in the illustrations. This can, of course, be varied, the yoke being slightly different, or a blouse with a kilt may be worn. For exercises at home any dress and knickers will do providing they allow free movement.

DRINKING. All the tissues of the body contain a certain amount of water, and in addition to this there is a large quantity of free fluid in the form of lymph, cerebro-spinal fluid, and blood. If the body is deprived of water, the tissues become dry and shrunken, the blood is thick, and the circulation sluggish. The body thus requires to contain a certain amount of water to maintain health and life.

The natural beverage for mankind is water, and its place can only be taken to a limited extent by other beverages. Milk can replace it largely when the solid diet is restricted, but is usually only drunk in such quantity when it is a matter of duty to one's health, while tea, coffee, and alcoholic drinks in large quantity are injurious. It is a matter of importance to health that a sufficient supply of water should be taken into the body daily. Water enters into the composition of the tissues and provides for the circulating fluids; it forms more than two-thirds of the body weight. On an average about 3½ pints are necessary each day, and a certain amount of this is taken in solid food. But the bulk of the day's supply should take the form of beverages.

Tea and coffee are consumed by most people and are beneficial, apart from their affording water to the body, and harmless if they are taken properly prepared and in moderate amount. Cold weak tea is a good thirst quencher, and this or oatmeal water proves very grateful to those who are engaged at hot, laborious occupations which cause free perspiration. Milk alone or with soda water should be taken freely by those whose nutrition is poor.

Alcoholic liquor, if taken as spirits, should be freely diluted, as neat spirit drinking is a fruitful source of gastric catarrh; the same is true of taking large amounts ot alcoholic liquors in any form, especially when they are taken apart from food. Beer or light wines are agreeable beverages and tend to increase the appetite and aid digestion, but the heavier brands should be taken sparingly. As summer drinks lime juice or lemon juice in water or soda water are very wholesome. Cider makes another wholesome drink and appears to benefit some people who suffer from rheumatism. The natural table waters may be taken alone or as diluents of other liquids.

Only a moderate amount of liquid should be taken at meals, and then only when there is no food in the mouth. A liberal allowance of fresh, wholesome water may be taken with great benefit in between meals. It is a mistake to take liquids very hot, as they may easily check the flow of gastric juice; an immoderate use of acid liquids, e.g. lime juice, lemonade, etc., in hot weather is a bountiful source of dyspepsia.

Drinking Water. Not only must drinking water be free from the gross contamination which sets up diseases like typhoid and alimentary disorders, but it must not contain too much mineral matter. Gross contamination may gain access to the water not only at its source but also when inside the house.

The source from which the water is drawn should first of all be considered, and the following classification is useful:

Wholesome	{Spring water. {Deep well water. {Upland surface water.
Suspicious	{Badly stored rain water. {Surface water from cultivated land.
Dangerous	{Unfiltered river water. {Shallow well water.

In the home, drinking water should be stored in vessels or cisterns placed in a light and well-ventilated position and kept scrupulously clean. Where there is a main supply, drinking water should never be drawn from the cistern but always from a tap on the rising main. In districts where rain water, collected from the roof, is used for domestic purposes, it should be stored in a covered concrete tank. It should not be allowed to stand in contact, with metallic lead, as soft waters are often able to dissolve lead, which may cause poisoning.

Where the source is dangerous or there is suspicion that the water is polluted, as happens in times of epidemic, it may be purified at home. This is done most conveniently by bringing the water to the boil. Heating it in this way will destroy all germs likely to produce

disease, and has the added advantage of rendering hard water softer than it was before. Some people object to the flat, vapid taste of boiled water, but this may be counteracted by pouring it backwards and forwards several times from one jug to another. This causes the air to circulate once more through the water, lack of oxygen being responsible for its lifeless taste. *See* Alcohol; Beer; Cider; Coffee; Diet; Filter; Milk; Tea; Water; Wine; etc,.

DRIPPING: How to Prepare. The dripping from beef is less hard when cold and devoid of the tallowy and sometimes even rank flavour of that from mutton. Spread on bread or toast, beef dripping is a nourishing food often given to children. In cookery, for frying, etc., it is invaluable, and is sometimes used for mixing with the flour for making cakes and pastry.

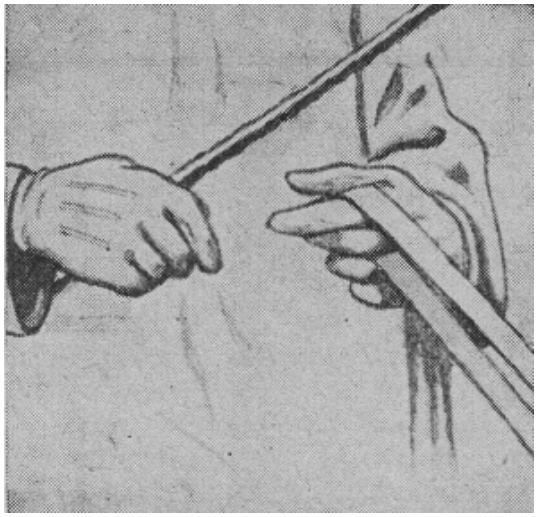
There are two methods of preparing beef dripping. The first is as follows. After a joint of beef is roasted, pour all the melted fat from the baking-tin into a jar or basin. Pour about a gill of hot water on to it, stir it well, and leave it until it is set and hard. Then raise the cake of fat, scrape off any soft or dark part from under it, and use as required. The water under the fat will often contain a little of the gravy from the meat, and should be saved for stock. If the fat is left on the water for long, it will absorb some of it and go sour. The second method consists of putting all the dripping from the joint in a saucepan with about ½ pint water. Boil it with the lid off the pan, until the bubbling ceases; then take the pan off the fire and cool it a little. Pour off the fat, from which, by means of the boiling, and its resultant evaporation, all water has been extracted, into a clean basin and it is then ready for use. Mutton and pork dripping are prepared in the same way. *See* Clarifying.

DRIVING. In driving a single horse the reins should be taken in the left hand, the left or near side rein being held between the forefinger and thumb, and the offside or right hand one between the second and third fingers, the palm of the hand being uppermost. The reins should pass out under the remaining fingers, which should close tightly over them. The arm should be held at almost a right angle across the body with the hand about 6 in. in front of the bottom button of the waistcoat. This will enable the right hand to be used easily when it is necessary to employ both hands, while it can also be used when the whip is required. In driving, the whip should always be used from, the wrist, not from the arm.

The seat should be above or at least on a level with the horse's head. It should be placed so that the driver can, if necessary, use his legs and feet to nullify the pull of the horse. The reins should never be allowed to hang loosely, although it is a mistake to grip them at all tightly. The driver should always feel the horse's mouth. The term hands used in connexion with driving and riding refers to the exact weight and pressure put upon the horse's mouth in guiding him and the give and take of the driver's hands.

In driving a pair the reins are held in the same manner, but as there are two horses to control instead of one, the task is more difficult, because they may not pull equally.

In Great Britain the rule of the road for driving is to keep to the left. If another vehicle is overtaken, the one that overtakes it must leave it on his left, himself taking the right. *See* Bit; Horse; Motor Car; Reins, etc.



Driving. Correct method of holding a pair of reins and whip.

DROPSY. An accumulation of fluid, derived from the blood vessels, in the tissues and in the cavities of the body constitutes dropsy. This takes place when the pressure in the veins becomes high, when the vessels' walls are damaged and made more permeable, and when the blood becomes thin. The first condition occurs when the veins are obstructed or when the heart is feeble and cannot drive the blood efficiently through the veins. The second condition exists when the circulation is poor or the blood thin and when poisons are present in the blood stream; and the third in anaemic and debilitated states.

When it affects the tissues it is called oedema, and if superficial causes visible swelling. If firm pressure is made on the swelling, particularly over bone, a depression is made in the skin by the displacement of the fluid, and the skin shows pitting. Oedema of the leg may be caused by a garter being too tight, and it also occurs in varicose veins. Oedema may occur in both legs in people who have been on their feet all day, particularly if they are somewhat anaemic. If there is definite anaemia and debility, it may appear even when the patient is in bed. The same thing applies to the dropsy of heart disease, which, eventually, may appear all over the body. Dropsy also occurs in Blight's disease.

Treatment of dropsy depends on the cause, but includes rest, and in some cases measures directed to increasing the discharge of fluid from the body by diuretics (q.v.).

Drop wort. *See* Spiraea.

DROUGHT. The effects are more apparent on heavy land than upon that of lighter texture, but the harm to crops during hot, dry weather is in both cases shown in starved and stunted vegetation. During days of drought the value of deep cultivation becomes apparent, for it is then that the hoe may be put to work to stir the surface earth to some depth, and thus prevent undue evaporation.

A thorough and frequent pulverization of the soil a few inches down is one of the best aids possible to counteract in measure the effects of drought, and there is no implement more suitable for the purpose than a three or five-pronged cultivator. A thin covering of some non-absorbent retentive substance is also of assistance, and one of the handiest materials for this purpose is short grass mowings from the lawn.

Watering should be done in the cool periods of evening or early morning. Effectual watering of the soil, overhead sprinkling, or spraying, to freshen leaves through their pores and wash dust from the foliage, followed by surface stirring and mulching, yield success in droughty seasons. *See* Soil.

DROWNING: The Treatment. In all cases of death from immersion in a fluid, what oftenest happens is that the fluid is drawn into the air tubes and produces suffocation. It will also be found that there is a large amount of fluid in the stomach. In some cases death is not caused by asphyxia, but by shock, due to cold or fright, or exhaustion from prolonged efforts to keep afloat.

The first thing to do in the treatment of the apparently drowned is to lay the patient on his back, turn his head to the side, examine, and, if necessary, clear the mouth and throat of mucus or anything else found there. Then, without delay whatever, carry out artificial respiration. No matter though the patient gives no sign of life, and has been immersed in the water for a long time, a persevering effort should be made to resuscitate him.

When he commences to breathe of himself, the rescuer's efforts should be turned to encouraging the circulation and bringing back a natural warmth. The patient's wet clothes should be got off, the limbs should be chafed, the direction of the rubbing being towards the heart, and he should be well wrapped in hot blankets, while hot-water bottles, adequately protected against burning, should be placed in the armpits and at the feet. A few teaspoonfuls of hot water may be given, and thereafter a cup of very hot black coffee, or a ½ oz. of whisky or brandy, diluted.

The patient should be kept in bed for at least 24 hours, to allow the heart to recover from the results of the strain thrown upon it. *See* Artificial Respiration.

DRUG. The continuous taking of certain drugs is apt to produce an irresistible craving for them, despite their injurious effect upon both mind and body. The commonest instances are addiction to alcohol, and smoking. The less frequent drug habits, such as the taking of opium or cocaine, may originate in taking the drug in the first instance under medical orders.

To check the serious growth of the drug habit, an Act of Parliament was passed in 1925 which aimed at the suppression of illicit traffic in cocaine and other dangerous drugs. Moreover, certain drugs can only be obtained by the general public on presentation of a doctor's prescription, which is afterwards retained by the dispensing chemist. The habitual drugtaker can be certified like an habitual drunkard.

When a drug habit has been formed, the only satisfactory method of treatment is to get the patient into an institution where it will be impossible to obtain the drug. Tonic medicinal treatment may form part of the cure, but moral treatment is what is really valuable, in the form of helpful advice and encouragement. Little or nothing can be expected from nostrums. *See* Alcohol; Cocaine; Opium; Poison; Tobacco, etc.

DRUGGET. This is a common felt or coarse woollen fabric, frequently printed with a pattern on one surface only, either used as a protection or substitute for a carpet. A lighter glazed linen drugget is sometimes laid to protect stair carpets and is used for table covering.

DRUNKENNESS. Over indulgence in alcohol causes loss of control over the movements of the body and over the speech, which becomes thick and indistinct. The same loss of control affects the mind, and the mood may become bellicose or maudlin and silly. In some cases a condition resembling somnambulism results. Frequently nausea and sickness ensue. Drowsiness manifests itself sooner or later, and may deepen into coma. This state is very like that of various other conditions, e.g. apoplexy, uraemic or diabetic coma, poisoning by other narcotic drugs like opium, chloral, etc.

It is often a matter of difficulty even for doctors to distinguish between these conditions and drunkenness, and obviously the greatest care should be exercised in dealing with such persons. It should not be hastily assumed that because a person smells of drink he is simply drunk, for he may be both drunk and ill. It is necessary to emphasise this point, as serious mistakes have been made and people suffering from apoplexy have been left to die because they were supposed to be simply drunk. A doctor should be summoned at once and in the meantime the person should be kept warm if necessary.

In the treatment of acute drunkenness the patient should be made to vomit and wash out his stomach with large draughts of tepid water. Strong coffee or sal volatile in teaspoonful doses in water may also be useful. Chronic drunkenness is very difficult to treat and will fail unless the victim can be induced, by beginning his cure in an institution, to give up alcohol altogether. Some of the graver results of chronic drunkenness are sterility, multiple neuritis, a tendency to apoplexy, delirium tremens and insanity, and the likelihood of epilepsy in the drunkard's offspring.

The Legal Aspect. In law drunkenness is a punishable offence in the following circumstances: being drunk in a highway or public place; being found drunk on licensed premises; being drunk and disorderly or riotous in a highway or public place; being drunk and in possession of loaded firearms; and being drunk, when in charge, on any highway or public place, of a carriage, horse, cattle, or steam-engine. It is also an offence to be in charge of a motor vehicle while under the influence of drink to such an extent as to be incapable of having proper control of the vehicle. A driver may be convicted of this offence although he is not drunk.

Where husband or wife is an habitual drunkard, the other spouse has the right to apply to a magistrate's court for a separation order. An habitual drunkard is a person who not legally a lunatic is yet, by reason of habitual drinking, at times dangerous to himself, or herself, or to others, or incapable of managing himself or herself, or his or her own affairs. A person who, in intervals of sobriety, is quite harmless and capable of business, may yet be an habitual drunkard. *See* Alcohol; Cirrhosis; Delirium Tremens; Dipsomania; Separation Order.

DRY CELL. The term dry cell is applied to the unit of all forms of primary electric battery in which the electrolyte is in a paste or semi-solid form, as distinct from the liquids used in wet batteries and accumulators. *See* Battery.

DRY CLEANING. Soiled garments of a delicate texture which cannot be subjected to the ordinary laundering processes may be sent to a professional cleaner, or the work can be done at home, special care being taken when using petrol or other highly inflammable cleaning agents.

Light coloured cloth garments are simply treated by the application of kitchen salt on a pad made from a large piece of white linen or nainsook. Lay the garment on a table, and scatter salt over it with a liberal hand, spreading it gently with the finger-tips until a thin powdering of salt is evenly distributed over the entire surface. Next take the pad and rub the salt into the cloth with long downward sweeps, not round and round, since this tends to roughen the surface and destroy the sheen of the material. Finally brush out all the salt, and the cloth will be found quite clean. If there are any badly soiled parts, such as on the hem of a skirt or the cuffs and collar of a coat, repeat the process two or three times.

Silk and satin garments are thoroughly cleaned by the following method, which should on no account be used except in the open air. Spread a clean sheet on a table placed out of doors, and have ready two large wash-hand basins, a tin of petrol, and a soft-bristled nail brush. Half fill one of the basins with petrol, dip the garment into it, giving it a gentle squeezing, then spread it out on the sheet, and brush it all over with long downward sweeps, going the right way of the material, from top to bottom. Rinse and squeeze it in the petrol again, and rub it vigorously with a folded pad made of white cloth. Pour some clean petrol into the second basin, rinse the garment thoroughly in this, squeeze it well, and hang it up to dry in the open air. Pull the garment carefully into shape before hanging it up. When quite dry and free from the smell of petrol, it may be brought indoors and ironed.

Cleaning Furs. Most furs, when really dirty, can be cleaned with hot bran, but this should rarely be necessary if they are wiped with a damp towel immediately after wearing. Children's white furry caps, coats, and capes can be cleaned with cornflour, which is scattered thickly over the fur, rubbed with the tips of the fingers, and then brushed out with a soft, white-bristled brush. This process creates a great deal of white dust, so that it is wise to tie a large handkerchief round the hair and to conduct the operations in the bathroom, where the powder can be easily wiped away with a damp cloth.

It is easier to clean things the first time than the second or third. Surfaces roughen with use, and dust and smoke fasten more quickly to a rough material than to a smooth one, and are also much more difficult to remove. For this reason the rubbing of the finger-tips on garments during dry cleaning operations should be done as gently as possible, and a hard brush should never be used.

Removing Grease Spots. Almost all kinds of grease spots will yield to treatment with a hot iron and a sheet of blotting-paper, while fuller's earth, dry pipeclay, magnesia, and French chalk are also effective if spread over the affected parts, left for a while, and then shaken off. Two applications are usually sufficient.

Another method of removing grease consists of putting a pad of clean cloth under the material, and sponging it on the wrong side with benzol, gasoline or tetrachloride. Use such cleansing agents at an open window and away from any naked light. To prevent the grease spreading as the spirit begins to dissolve it, surround the spot with a ring of French chalk, which acts as an absorbent. French chalk may be used with safety on any light coloured and delicate fabric. The article to be treated is placed on a clean towel, and rubbed all over with the chalk, extra attention being paid to those places where there are definite marks to remove. The garment should then be rolled up in the towel, laid aside for three or four days, and afterwards brushed lightly to remove all traces of chalk. *See* Clothes.

DRYING: Of Clothes. The ideal method of drying clothes is to hang them in the fresh air on a breezy day. Fresh air, and especially bright sunshine, have a bleaching action, and will remove stains and any yellow tinge caused by the soap and soda used in the washing process. More important is the fact that fresh air is a powerful disinfectant, therefore woollen and silk garments which cannot be disinfected by boiling can be

rendered free from infection if exposed to fresh air.

In the country the washing may be hung in a meadow or small orchard, which removes from the house windows a view of the necessary posts and line, somewhat unsightly in small gardens. Strong tall posts, preferably of oak, are required if there are no trees or other supports, such as a brick wall, to which the lines can be attached.

Galvanized iron wire and hemp rope are the usual kinds of lines used. Rope lines must not be left out of doors longer than necessary, as rain, with particles of dust and soot, soon causes them to become discoloured and rots the fibres. A soiled line is often responsible for dirty marks on clean linen. After use the line should be coiled up and put away with the clothes pegs, in a linen bag in preference to a basket.

Whoever is hanging clothes out to dry should stand with her back to the wind and peg with the garment facing her, this arrangement allowing the wind to blow well into the garment. Avoid placing the pegs in any very conspicuous part, e.g. peg blouses by the waist and not by the collar. Pillow-cases should be hung with the open end uppermost. Before pegging out, all garments should be turned if they are not already on the wrong side, in case the damp clothes inadvertently touch trees or bushes.

The ordinary clothes horse placed around the kitchen stove is a very general way of indoor drying. Woollen garments are the most difficult to dry indoors. Place these on a ceiling dryer or on lines hung across the kitchen. Drying in front of the fire often causes woollen and flannel garments to shrink. When indoor drying is a necessity, open the windows and doors to allow a current of fresh air to pass through. This is the best alternative to drying in the open air.

There are fitted cupboards heated by gas, electricity, or oil specially made for drying clothes which are designed so that a current of fresh warm air constantly passes through the cabinet, and arranged that the heavy and moist air is extracted from the bottom. These are specially useful for flats and houses where there is no hot cupboard for airing clothes. They answer the double purpose of dryer and airer. *See* Airer; Clothes Horse; Clothes Line; Laundry.

DRY MEASURE. Dry measure is used for potatoes and vegetables generally, also for grain of various kinds. Analogous in some respects to liquid measures, it is as follows:

4 gills =1 pint	4 pecks =1 bushel
2 pints =l quart	8 bushels=1 quarter
4 quarts =1 gallon	36 bushels=1 chaldron
2 gallons =1 peck	

A peck or stone of flour weighs 14 lb.; a bushel or 4 pecks of flour 56 lb., and five bushels or a sack of flour 280 lb. A quartern (or quarter-peck) of flour weighs 3 lb. 8 oz. There are a number of local bushels. A bushel of English wheat is 60 lb., of foreign wheat 62 lb., of English barley 50 lb., of oats 39 lb.

DRY MOUNTING. This is a process for mounting photographs and prints of any kind perfectly flat on any kind of support. Between the print to be mounted and the card or other support a thin sheet of tissue paper impregnated with shellac is placed. This tissue can be obtained from photographic dealers. Heat and pressure are applied, under which the shellac melts and firmly cements the print to its mount. No moisture of any kind is required.

The amateur can obtain good results with the ordinary flat iron. A special electric iron is also available. To mount a photographic print by this method, take a sheet of dry mounting tissue of exactly the same size as the print to be mounted and lay it flat upon the back of the print. Touch the tissue lightly at the two upper corners with the point of a fairly hot iron; this causes the tissue to adhere where it is touched. If the print requires trimming it should be done at this stage so that print and tissues are trimmed together.

Lay print and tissue down on the mounting card in its right position, lift the print and touch the tissue at the bottom corners with the hot iron, so that it adheres to the mounting card. The print is now ironed all over with an iron heated to such a temperature that water applied to it sizzles slightly, i.e. it should be just above the temperature of boiling water. If the temperature is not right it will be impossible to carry out the mounting process successfully.

The print should be covered with a sheet of thin tin or a piece of brown paper which has previously been well ironed on both sides, and the heated iron then applied with considerable pressure for about 15 or 20 sec., moving it about so that each part of the print obtains heat and pressure. If the print is a large one the ironing will have to be done in portions. If the print adheres to the tissue but the tissue does not adhere to the card, the iron was not hot enough. If the tissue adheres to the card but not to the print, the iron was too hot. *See* Mounting; Printing.

DRY ROT. The most prolific cause of dry rot is the use of timber in a wet condition, such as might be seen on new buildings when the timber is on the site but lies uncovered perhaps for months before it is used. If such timber is then placed in position, certain parts being built in the walls, often covered with mortar, there is no chance of it ever getting dry in a natural way.

Combined with the above cause the ground on which the building is taking place is often made up; that is, it has been used as a public tip, whereon any and everything imaginable has been deposited to fill it up to the required level for building.

The house is kept down to as low a level as possible to save expense, and perhaps no earth is carted away from under the floors. The consequence is that the wet wood and the foul earth encourage fungus to start.

Preventive Measures. To prevent dry rot the timber should be kept as dry as possible, and if it

cannot be kept under cover it should be so piled that the water will run off instead of soaking in. When timber is built into walls, allow it to lie on the bricks; any bricks which are built up to it or which lie on it should have no mortar intervening. Not only does mortar encourage the growth of fungus, but if the bricks come to the wood they will fit sufficiently slack to allow a certain air-space between. The mortar does not do this. Avoid the use of wood bricks. Even if put in dry they are unsatisfactory, but when cut out of the odds and ends on the job, usually soaking wet, and bedded in mortar like ordinary bricks, they are a fruitful source of trouble. It is better to plug the walls after; the risk will be practically nil.

Dry rot cannot be cured, but where the fungus has already got a hold it may be destroyed. Take out every piece of wood which shows the least sign of being affected. The disease runs further on the inside of the wood than it does on the surface, and unless every trace is cut away it will certainly start again. Next clear out the fungus from the adjoining brickwork, from openings in the walls, and from the bedding of all bonds, etc. The fungus and the affected wood should all be swept up and burnt to prevent the new wood from being attacked.

Before any old wood is replaced with new, the surrounding walls, the old wood left in, and all the new wood should be coated with an antiseptic solution, such as corrosive sublimate mixed fairly strong. This can be obtained from any chemist and must be used carefully, being a deadly poison. *See* Wood.

DUBBIN. Dubbin is a greasy preparation for dressing leather and rendering it waterproof, and is used especially for fishermen's boots or for boots worn in wet weather. The dressing, which is not glossy, may be made by melting together tallow, 2 oz.; paraffin wax, 1 oz.; and heavy mineral oil, 5 oz.; and perfuming with a few drops of mirbane oil. Another recipe is to melt together Russian tallow, 8 oz.; paraffin wax, 1 oz.; cod liver oil, 16 oz., and add sufficient mirbane oil to cover the odour of the fish oil. Dubbin is freely rubbed into the leather after washing off the mud and drying the boots.

DUCHESSE COVER. This type of toilet cover came into fashion when dressing tables were first made with the looking-glass attached to supports rising from trinket drawers on either side. It is usually a straight strip of white or coloured linen embroidered and hem-stitched or inlet with motifs of the lace which forms the border, and is sold in two or three lengths and widths to suit the average size of tables. Duchesse sets may be purchased, with three extra mats to match the cover.

Large squares or oblong motifs in real or imitation filet lace of good design can be used joined together and bordered with narrow filet insertion. Fine crochet, let into linen or worked to form handsome corner pieces with narrow edging to match, wears better than anything for this purpose. Embroidery or drawn-thread work can be used in combination with crochet or as separate trimming. On coloured linen of rather coarse weave wool embroidery is effective. *See* Crochet; Drawn Thread Work; Dressing Table.

DUCKS: THE BREEDS, THEIR CARE & COOKING

Methods of Breeding and Feeding with Preparation for the Table.

Related information will be found under the headings Apple Sauce; Aspic; Boning; Casserole; Forcemeat; Pastry; Salad. See also Chicken; Egg; Incubator.

Duck keeping in Great Britain is practised mainly for the purpose of producing ducklings for the table, but ducks of a good laying breed and strain may be kept profitably for egg production a season longer than hens. The duty on imported ducks has stimulated home production. Refer to the Ministry of Agriculture's Bulletin No. 70 for detailed information.

Types of Duck. The fawn and white Indian runner, the white Indian runner, the khaki-Campbell and the buff Orpington breeds can all be recommended for egg production. Both the Orpington and the khaki-Campbell produce good marketable ducklings of moderate size for the table, although they are not equal in size or quality to Aylesburys.

As a table duck the Aylesbury is unequalled, owing to the superior quality of its flesh, to its size, and to the rapid growth of the young ducklings; but it is not as a rule a good layer. Ducklings can be produced weighing from 4 to 5 lb. apiece at about eight weeks old—a result impossible of achievement with any other duck. Adult drakes occasionally turn the scale at 9 or 10 lb. The plumage is pure white, the bill flesh coloured, and the eggs a bright orange. The body should be massive with good girth, deep and straight keel, a full breast carried low, the crop almost touching the ground.

The Indian runner is characterized by an almost upright carriage. As a utility breed it is in the front rank and, although not a large bird, its flesh is of fine quality. As a layer it excels all other varieties, its eggs being large and white-shelled. It is an excellent bird for the smallholder, as it need not necessarily have water for swimming.

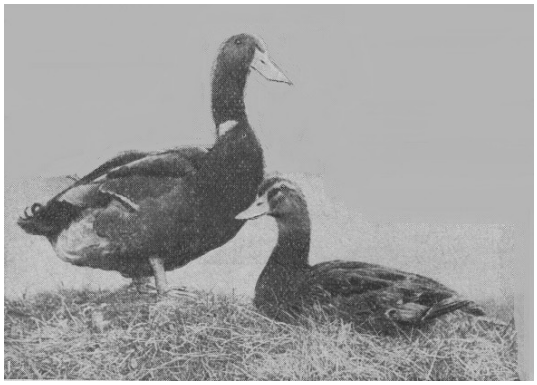
The Pekin and Rouen ducks have the merit of size, and the former, besides being rapid in growth, is superior to the Aylesbury as a layer. Taking the average, a dozen Pekin eggs will weigh 2 ½ lb., and this is not excelled by any other duck. As a table bird it does not equal the Aylesbury, but its breast is wide and carries a lot of flesh of a particularly nice flavour and of fine quality.

An adult Pekin drake should weigh 9 lb. to 10 lb., and a duck 8 lb. to 9 lb. From stock birds of such weight can be bred ducklings which weigh 4 lb. to 5 lb. at 8 weeks, 7 lb. at 10 weeks, and 8 lb. at 12 weeks.

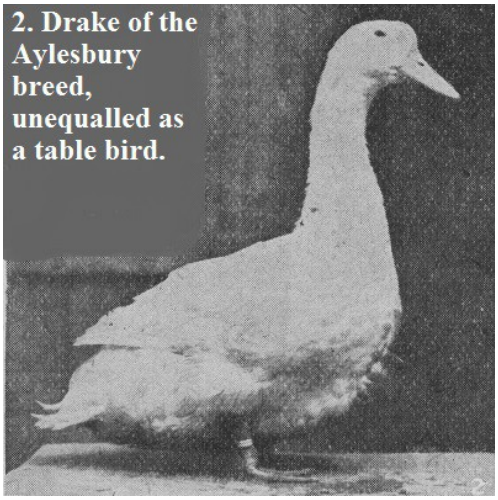
Pekins are a canary colour, the bill is bright orange, and slightly convex in shape; the legs and feet are orange, whilst the eye is a dull leaden blue colour.

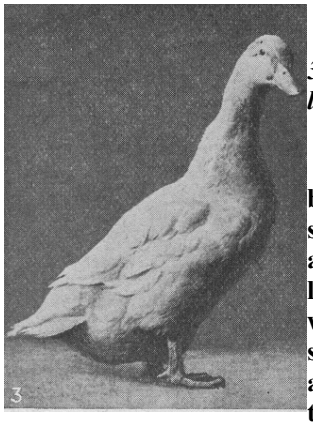
The Rouen drake has a greenish-yellow bill, dark green head and neck, claret breast, green-black back;

the thighs are silvery grey, pencilled with a darker shade. A glossy blue band, bordered by a narrow black outer clear white bar, runs across the wing; the legs and feet are brick red. The duck is brown, the feathers being laced with bright black lacing; the wing bar is like the drake's. Stock Rouens in breeding condition weigh—drakes, 10 lb. to 11 lb., ducks 9 lb. to 10 lb. When fattened they weigh 2 lb. more. They are not so white in skin as the Aylesbury and Pekin, and for this reason are not quite so popular as table ducks; the flesh, however, is extremely rich and luscious. They are a hardy and very profitable breed.



Duck: some profitable breeds. 1. Rouen drake and duck, excellent both for table and for egg production.



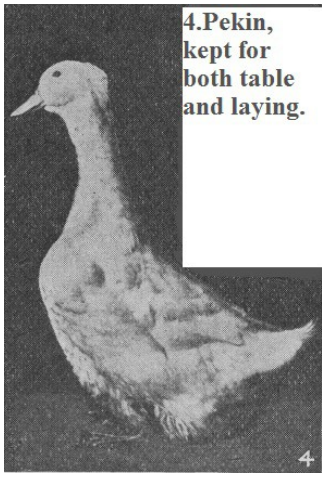


3. Buff Orpington, a good laying breed.

Duck Breeding. The breeding of ducks upon a small space is not advisable, and although the smaller laying varieties will breed without access to water for swimming, better results are secured in the case of the larger table breeds when the birds are able to obtain swimming exercise. The cost of feeding an adult duck upon a limited space exceeds that of a hen, without, as a rule, yielding a proportionate return.

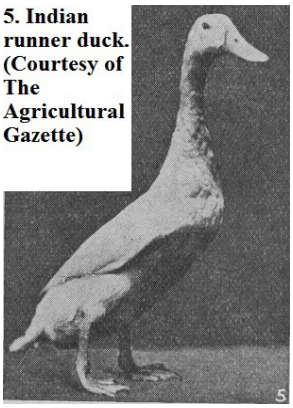
Ducks are not sufficiently mature for mating purposes until they are about eight months old, and drakes should preferably be a month or two older. For the best results, young drakes should be mated with ducks from eighteen months to two and a half years old. With the large breeds four or five ducks may be mated with one young drake, while with the smaller breeds one drake may be sufficient for from five to eight ducks. The stock should be kept in active condition by only giving sufficient food to supplement foraging, but when a large number of eggs for consumption is required diet on a more generous scale may be given.

As regards the duck house, one can either be purchased or a disused shed adapted to the purpose. It need not be more than 5 ft. high, but the more air space the better. Ducks and ducklings must have dry bedding.



The use of incubators for the hatching of duck eggs is less commonly practised than in the case of hen eggs. The temperature for incubation should be run at 102° if a hot-air machine, or 103° if of the hot-water type. Preference should be given to the use of broody hens. It is seldom worth while permitting a duck to hatch her own eggs.

When hatched, the ducklings of the larger-table breeds are stronger and more easily reared than chickens, and if mothered by a hen it is seldom necessary to leave them with her for more than 3 weeks, and from 10 to 14 days or even less will prove sufficient in warm weather. If reared with artificial heat, the temperature of the foster-mother should be kept lower than for chickens. Plenty of air is required in the heated compartments, and the ducklings should be accustomed to do without heat as quickly as possible. The ducklings of the smaller laying breeds are rather delicate for the first few weeks, and should be well protected from rain and damp. No food should be placed before the ducklings until about 36 hours after hatching, and then some damp earth may be supplied in a saucer in which the birds can find particles of fine sand or grit. For the first feed, bread and milk or fine biscuit meal scalded and dried off with middlings or ground oats, or coarse steeped oatmeal with a little maize meal, are among the most suitable.



5. Indian runner duck. (Courtesy of The Agricultural Gazette)

Feeding Ducklings. This food, and in fact all the meals, should be given in a moist crumbly condition. At about a week old, boiled rice can be given for variety, and a little finely chopped cooked meat with this is beneficial. Fresh cooked meat can be given daily in small quantities, or fish meal can be used, or meat meal, provided this be free from bone, fur and hair—frequent causes of impaction of the crop. Both these meals are better if scalded before mixing with other meals, and a proportion of five per cent of fish or meat meal in the whole mash is sufficient at first.

From a month old barley meal may be substituted for ground oats. The fish meal can be increased to 15 per cent after the first month and boiled rice may be included in the diet several times weekly. Feeding should take place at 2 to 3 hour intervals during the first month, and the ducklings will benefit by frequent feeds in small quantity, but this must depend upon the amount of natural food which they can obtain for themselves by foraging.

If the ducklings are intended for table, they should not be allowed swimming water, and should have their range restricted at the age of five weeks. While fattening they should be given as much food as they will consume three times a day. The fattening food should consist largely of barley meal and good quality middlings. A small proportion of maize meal can be added, and ground or crushed oats used as an alternative to barley meal. Boiled rice can be continued, mixed with middlings, and it is an advantage to boil the rice in water in which nettles have previously been well boiled. Fish meal should be omitted when fattening and cooked meat offal supplied in its place. Ducklings for the table should be killed when about 10 weeks old, and in any case before they begin, to show the adu1t feathers. Ducklings intended for stock purposes thrive better upon free range and with only sufficient food given to supplement their needs after foraging. Similar food as for table birds may be used, except that fish meal may be continued and barley meal replaced with middlings in larger proportion.

Adult ducks upon free range only require one feed daily for about eight months of the year. This should be given in the evening, and should be a moist mash consisting of simple ingredients such as middlings, bran and maize or oat meals, with about 10 per cent fish meal. A moderate feed of steeped grain or of meals should be given in the morning during hard weather, or if natural food cannot be obtained by foraging. A set hour for feeding should be observed.

Treatment of Roup. Ducks and ducklings are subject to fewer diseases than fowls and chickens. Like fowls, they suffer from roup, but of a far less virulent type. There is no discharge from the nostrils, but there is from the eyes, which water copiously and damp the feathers all round. Foam and dry matter collect, giving the duck a very peculiar appearance. The eyes should be bathed and wiped, and if the eyelids look sore a little vaseline should be rubbed round, and the birds should also be given roup powder or suitable pills. When the sun's rays are powerful, ducklings should never be let out in the middle of the day, or some are sure to be affected by sunstroke, as the covering of the skull is very thin. They will be found lying on their backs kicking feebly, and seldom if ever recover. Adult ducks are not affected in this way, as their feathers afford protection from the sun's rays.

Plucking the Birds. All birds should be starved for a full 24 hours before killing, in order that the crop and intestines may be emptied of food. The best method of killing is to dislocate the neck just where it joins the head. This method, when properly performed, results in the breaking of the jugular vein, and the blood drains from the body veins into the neck. Some persons like the fowls to be bled by a knife passed through the slot in the roof of the mouth.

Birds should always be plucked while the body is still warm, as the feathers then come out more easily and there is less danger of tearing the skin. If this is not possible the operation should be postponed until 24 hours after killing. In plucking, fowls should be held by the legs, with the head hanging downwards. The feathers should be drawn by a firm yet gentle pull towards the head. The plucking should begin at the tail and be continued in the following order: back, neck, wings, sides, legs, and breast. The breast bone should not be broken. The wings and half the neck must be left unplucked. The legs and feet should be quite clean.

When plucking has been completed, the birds should be singed and packed tightly, breast downwards, in a shaping trough with their heads hanging over the front board. They are left in position for the flesh to set and cool. A long, narrow board should then be placed along their backs and the board weighted, a common method being to use a 9 lb. brick to every two birds. In placing the birds in the trough, the stern is pushed hard up against the back board, thus giving the birds a shortened appearance.

How to Cook. Ducks require a shorter time for cooking than either fowls or turkeys, since their flesh is much firmer and closer. When buying ducks, it is well to remember, that they are at their best under a year old. Their bills and feet should be yellow and pliable. If they are red and feel hard, it is an indication that the bird is old.

When roasting a duck after trussing spread plenty of beef dripping over it. Put the giblets into a pan with a pint of stock and six peppercorns and stew these to make the gravy. Put plenty of dripping into the baking tin for basting and allow about 1 hour for cooking. The oven must be hot when the bird is put into it. After 10 min. lower the heat slightly and continue cooking in the same temperature until the duck is done. A quarter of an hour to each pound of meat and a quarter of an hour over is a good average time to allow for cooking. Frequent basting with the dripping is necessary, and must be done quickly, as heat is lost in opening the oven door.

When cooked, remove the bird from the oven and untruss it. Place on a hot dish and mix the dripping with a little flour before browning it over the fire. Stir in any brown particles clinging to the sides of the tin, then add a little giblet stock and also ½ pint brown sauce or water and a seasoning of salt and pepper. Boil up and cook for 5 min., then strain the gravy into a hot tureen. Garnish the dish daintily with watercress.

The duck should be served very hot with apple sauce, green peas, roast potatoes, celery or other seasonable vegetables, and a little of the gravy should be poured round the dish.

Braised Duck. Duck is excellent braised in a casserole. Wash 1 lb. turnips, 2 carrots and a stick of celery, and peel an onion, cut all into large pieces and then put them into the casserole. On these lay 2 slices of ham, then 1 good-sized duck, trussed for roasting, and lastly another 2 slices of ham. Put in a bunch of parsley and herbs tied together, ¾ pint brown stock, a little salt, and a dust of nutmeg. Lay a piece of buttered paper over the bird, put the lid on the casserole, and let its contents cook gently for about 1 hour or until the duck is tender. When the duck is ready, remove the skewers and string, replace in the casserole, and serve.

Savoury Recipes. Salmi of duck is prepared from a roast bird. Put the giblets into a saucepan containing a little stock, 3 finely shredded shallots, and a little cayenne pepper and salt, and stew them gently for 25 min. Then cut the roasted bird into neat pieces, add it to the gravy, and let it simmer until it is thoroughly heated. When this is done, arrange the pieces of duck on a hot dish, boil up the gravy and add the juice of a bitter orange. Strain this gravy over the duck and serve the whole very hot accompanied by an orange salad.

A rich dish known as terrine of duckling is prepared by first making a forcemeat with ducks' livers as the chief ingredient. Season 5 or 6 of these with pepper and salt, and sprinkle over them a little powdered bay leaf and thyme and half a small chopped onion. Have ready heated in a frying pan 3 oz. butter and the same quantity of chopped fat bacon, and in these put the livers over a fierce fire to heat, but not to cook thoroughly. Leave them to cool, and then put them through a sieve.

Bone and stuff a duckling with the forcemeat, tie it into a more or less natural shape, and put it into a terrine. Sprinkle over it a wineglassful of brandy and lay on it a slice of fat bacon; then cover the terrine, and place it in a bain-marie in the oven and cook the bird for about ¾ hour. Make a savoury jelly with the bones of the bird and some good veal stock, and use it for covering the duck. Before dishing the bird, make certain that all grease has been removed; coat it with the jelly, and serve it cold in the terrine on an oval dish.

Duck Pie. Duck pie is a baked pie and makes a welcome change from the more usual methods of cooking duck. Prepare it by cutting an average-sized bird into neat joints, and frying these in a pan containing 2 or 3 oz. dripping. When the pieces are of a delicate brown tint, lift them out of the pan, drain them thoroughly and mix them with a little sage and onion stuffing. Simmer any trimmings left over in a saucepan containing just enough water to cover them, and add half a chopped onion and a pinch of salt.

Parboil a few large potatoes, then cut them into slices and arrange them, with the joints of duck and stuffing, in alternate layers in a pie-dish. Moisten the whole with a little water before covering it with puff pastry and bake it in a fairly hot oven for about 1¼-1½ hours. Before serving the pie, pour a little of the stock from the trimmings through the hole in the pastry.

The Eggs. Slightly larger than hens' eggs ducks' eggs are either light green or white in colour and contain a greater proportion of oil. They are, too, more strongly flavoured, and because of their richness are not suitable for invalids.

The eggs may be boiled, poached, or cooked in any other way as directed for hens' eggs. The time required for cooking them is approximately the same as that required for other eggs. In the preparation of puddings, cakes, pastry, etc., where the use of eggs is recommended, ducks' eggs may be used with excellent results. Employed in this way, they are most economical, one duck's egg being equal to two small hens' eggs.

DUCK: Linen and Cotton. Serving in its heavier form for tent cloth, duck in its lighter makes is used for sailors' white uniforms and for men's suits in the tropics. There are both linen and cotton ducks, and the former are the more expensive and last longer. The cloth is not twilled, but plain, and is often made in hopsack pattern for suitings. It is stiff and wears well.

Uppers of gymnastic shoes are often made in white cotton duck. Awnings, sunblinds, stretchers for deck chairs, hammocks, boat sails, motor car covers, kit-bags, are other uses for heavy duck.

DUCK BOARD. The name is applied to a form of slatted framework used to place on muddy or soft ground to act as a temporary footpath. Such boards can readily be constructed from odd material; convenient sizes are 6 ft. long and 18 to 24 in. wide.

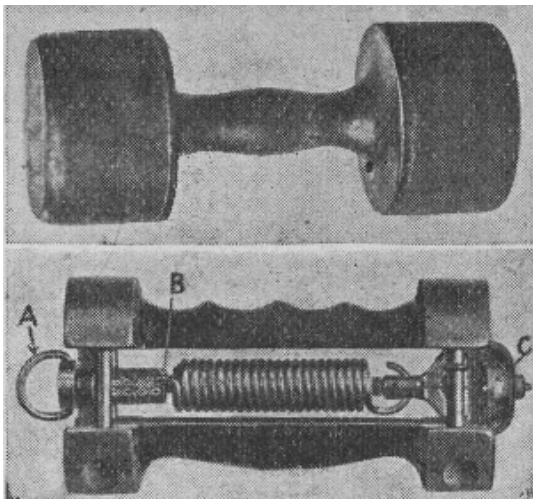
The term is also applied to a board used by plumbers and tilers when building or repairing a roof; it is used to preserve the roofing material from damage by the workers' boots.

DUFFEL CLOTH. Taking their name from a Flemish town, duffel cloths are winter overcoatings. Warm without being too heavy, they are a useful alternative to nap cloths, and have generally a plain surface with a short fluff of fibre, soft and spongy.

DUMB BELLS. Dumb bells are grasped one in each hand, and it is claimed that their use brings every muscle in the body into play. Iron ones, weighing from

4 to 6 lb. each, are the most general, but wooden ones are also used. The weight depends upon the age and strength of the user. It is a mistake to use bells that are too heavy, as they cause undue exertion, while those that are too light are almost useless.

The best times for using the bells are in the morning, just after a bath, or before retiring to bed. Most persons will find 4 or 5 min. quite sufficient for this exercise, although usually men training will give much more time to it. There are a number of useful exercises which may be repeated for 20, 30 or 40 times. One is to raise the arms horizontally and rigidly till they meet over the head, and then to lower them in the same way. Another is to hold the bells at full length in front of the body, then raise the arms vertically and lower them in the same way. A more elaborate exercise is to place the bells on the ground, then, bending from the hips with the legs quite stiff, take them in the hands and raise them with rigid arms over the head. This exercise is an excellent means of improving and strengthening the muscles.



Dumb Bells. Above, plain wooden type; below, sectional diagram of grip-testing pattern. (Courtesy of Standard Health Appliance Co., Ltd.)

The dumb bells illustrated are constructed in the form of the hands, so as to give a better grip than is given by the ordinary bells. By turning the ring A in the direction of the arrow the pressure resistance is increased; by turning it in the opposite direction the resistance is decreased. The pointer B indicates in pounds on the scale the pressure exerted to close the dumb bells. Whilst exercising, the user should keep the two halves firmly closed, and to enable him to do this a bell C will ring when compression is complete. To begin, the spring should be set at a minimum resistance and gradually increased. *See* Exercise.

DUMB CRAMBO. This is a variant of charades and may be played under similar conditions. Sides are picked, and one side goes out of the room while the other selects two words which rhyme with each other, e.g. nose and rose. They decide that the other party shall act rose, and accordingly tell them that the word rhymes with nose. The outside party proceeds to act in dumb show any word which rhymes with nose, until they guess the right one.

The spelling of the word is unimportant providing that the sound is the same. In the case given they might act the word as if it were spelt rows. The best results are obtained when the guide word is one which has many rhymes to it, and if the most unusual of these is chosen in order to tax the ingenuity of the acting party. *See* Charades; Crambo.

DUMBNESS. The condition of dumbness arises from inability to produce articulate speech and its most frequent cause is deafness (q.v.).

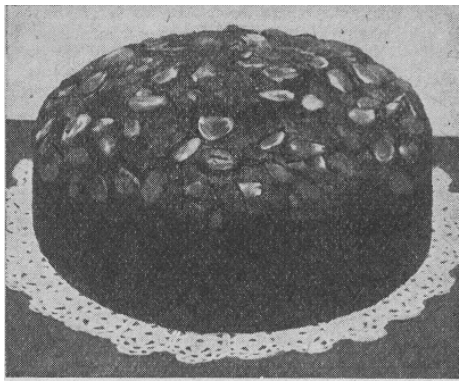
DUMPIE FOWL. This is a Scottish breed characterised by remarkably short legs giving it a curiously squat appearance. It is a very fine layer, a good table bird, and an excellent sitter and brooder. It is bred in several colours the most popular of them being cuckoo or barred like the Scotch Grey. *See* Fowl; Poultry.

DUMPLING. Dumplings are made from the same ingredients as a plain suet pudding, and cooked, tied in a floured cloth, in boiling water. They can be served plain, in soups, stews and hashes, or made savoury and served with gravy.

To make dumplings, ½ lb. suet should be allowed to 1 lb. flour and 1 teaspoonful baking powder. These ingredients are stirred together with a pinch of salt and mixed with cold water into a soft paste. This is divided into balls, and these are tied up in the corners of a floured pudding cloth which has been wrung out in hot water, and are then boiled for about 1 ½ hours.

Savoury dumplings are made by adding to the above ingredients 2 tablespoonfuls of chopped parsley and 1 tablespoonful of mixed herbs, pepper and salt. They should be dropped into the stewpan an hour before dishing up the stew. *See* Apple Dumpling.

DUNDEE CAKE. This fruit cake is very simply made. Cream together 5 oz. granulated sugar and 7 oz. margarine, afterwards beating in 3 eggs, one by one. When these are mixed stir in 1 ½ oz. ground almonds, ¾ lb. flour, 6 oz. sultanas, and ½ lb. currants.



Dundee Cake, a rich fruit cake the top of which is covered with blanched almonds.

Beat all these ingredients for a few minutes, and put the mixture in a greased cake tin lined with greased

paper reaching 2 inches above the top of the tin. Cover the top of the cake with halves of blanched almonds and bake it in a moderately hot oven for about 2 to 2 ½ hours, lessening the heat after the first 20 minutes, and covering the top with paper when lightly browned.

DUNGAREE. For making overalls dungaree is extensively used. It is a cotton fabric, usually blue or brown, a strong twill, often rough to the touch, not easily torn and made from hard-twisted yarn. *See* Overall.

DUNNING. Although appetising when thus treated, cod loses much of its nutriment in dunning. The fish is opened, well cleaned, and the non-edible parts removed, then washed and scaled. It should be rubbed inside and out with common salt and left to hang in a cool place for 24 hours. A mixture is made of 1 oz. brown sugar and 1 oz. saltpetre to 2 oz. bay salt, and this is rubbed into the fish. The fish is sprinkled with common salt and allowed to stand for 24 hours more. It is then drained, well dried, and kept in a cool, dry place until needed. *See* Cod.

DURHAM CUTLET. Prepare these cutlets by putting 1 oz. butter and the same quantity of flour into a saucepan, and mixing them over the fire. Add ¼ pint stock or water, and let it boil, stirring all the time, then put in a pinch of salt, pepper and cayenne and 1 dessertspoonful of bottle sauce. Then pour the liquid into a bowl, add 3 or 4 tablespoonfuls of breadcrumbs, and ½ lb. of any minced meat, mix them well, and spread the mixture on to a plate.

Lay it aside to get cold and firm, then cut into triangular shapes with a floured knife, starting from the centre. Sprinkle the hands with flour, and shape each piece into a neat cutlet, putting an inch of macaroni into the narrow end of each to represent a bone. Egg and crumb the cutlets, fry them in hot fat, and arrange them in a circle round a hot dish. Mashed potatoes, spinach or green peas might be heaped up in the centre of the dish.

DURHAM PUDDING. Put a tablespoonful of Demerara sugar and ½ gill water into a saucepan and boil them for 5 min. to produce a syrup. Stalk and wash ½ lb. red currants, add them to the syrup in the pan, and cook them slowly until they are tender, which should take about 20 min. Dissolve the contents of one packet of red currant jelly in a pint of hot water.

Line a pie-dish with sponge cake, splitting the cakes in halves, and placing the top halves to the bottom and sides of the dish. Mix the stewed fruit with the jelly, and pour the mixture over the sponge cakes until the dish is full. Then place the remaining halves of the sponge cakes on the top of the dish, with the cut side inside. Press these well down so that the fruit and jelly soak into them, and cover the top with a dish, pressing it down with a heavy weight, and leaving the whole until it is cold and set. Turn it out to serve. Any kind of stewed fruit can be used for Durham pudding.

DUST: A Menace to Health. In large towns the air is laden with particles from fires and furnaces, and dwellers in those places show the effects in pigmentation of their lungs. In coal and other mines, and in certain classes of workshop and factory, e.g. potteries, steel grinding shops, etc., unless the ventilation is attended to and spraying adopted, workers who do not wear masks are liable to suffer ill-effects from the irritation of the lungs by dust. In occupations involving the deposition of dust on the skin, inflammation of the skin or dermatitis is likely to result, unless strict cleanliness is practised. *(See* Spring Cleaning.)

The air passages have natural protective powers against dust, but when a large quantity is inhaled the defensive mechanism is overpowered, and some of the dust remains and produces discoloration of the lungs. The lungs of an infant are pink, but after years of residence in a town or elsewhere, if there is much dust in the air, they become grey, apparently without any bad effect on the lungs or the general health. But if the accumulation goes beyond a certain point, or if the particles inhaled are irritating, a reaction is produced in the lung tissues, and catarrh of the bronchial tubes is set up. The general health suffers, the patient is anaemic, and later consumption may occur.

The risk to life involved in the chest diseases due to dust varies even among dusty occupations, but the tin miner certainly stands the poorest chance. The terms grinders' rot and potters' asthma convey the menace to health in other occupations; the list is a long one, including workers in cotton and grit mills, tobacco factories, sawmills, brickworks, etc. Preventive measures are carried out in most factories and mines by improved ventilation, keeping the air damp, etc., with immense benefit to all concerned. Workers in dusty trades should always wear respirators, however troublesome they find these to be in the course of their employment.

DUSTBIN. The metal sanitary dustbin is secure against insects, and also against prowling animals, provided the lid is always kept on, as it should be. The lid also keeps the contents of the bin from getting wet or being blown about when there is a wind.

The dustbin should be kept clean, both inside and out, by means of hot water and some disinfectant, such as permanganate of potash. It should be placed outside the house on a firm, dry foundation in a spot readily accessible for the dustman. The contents should be emptied at least once a week. Dustbins should be used, as far as possible, for dry refuse; all damp refuse should be burnt. *See* Refuse; Sanitation.

DUSTER. Bought dusters, unless extremely low priced, are satisfactory, but it is economical to make dusters at home from material which would otherwise be thrown away. Ordinary cotton materials are unsuitable, as they are non-absorbent, but wincey,

flannelette, and old sheets all cut up into serviceable dusters when hemmed. A slightly damp (not wet) duster collects dust more readily if a room is really dirty. To wash out the grime and grease from soiled dusters, the best medium is a soapy lather to which a little soda has been added.

A soft piece of chamois leather soaked in cold water and wrung out tightly makes an excellent duster. It can be used on the finest furniture without fear of scratching, and will remove the most obstinate fingermarks. An additional advantage is that chamois leather leaves no threads or fluff behind it. When polishing any kind of furniture, a great saving in labour can be effected by using a hot duster, It is a good plan to keep a couple of dusters in a cool oven and use them alternately while they are warm. A high polish will then be easily secured. Care must be taken to see that the dusters are not scorched.

DUSTING. A house should be dusted throughout every day. In the living-rooms the fireplaces should be done first and the room swept, and no dusting ought to be attempted until the dust caused by the sweeping has had time to settle.

All dusting should be done from the top to the bottom—-that is to say, mantelpieces and the higher pieces of furniture are done before fenders, etc., as the dust dislodged from them will sink on to the lower places, and be finally removed from them. Every ornament must be moved: it is not enough merely to go round them, as that will leave an ugly ridge of dust.

Among things which are frequently neglected, yet which provide harbourage for dust, may be mentioned picture frames, bars of chairs, and electric-light shades or gas-lamps, for which a light dusting brush may be used. Last of all, the surround of the floor should be dusted. For this purpose a slightly damped duster may be used or a long-handled mop.

Dust Sheet. Made usually of coarse sheeting, dust sheets can be cut from any spare length of material. They are especially useful when spring-cleaning, white-washing, or distempering is being done, or when the occupants of a house are leaving for holidays. If they are not bought ready-made, the sheets should be hemmed down on all four sides.

The amount of material required depends upon the size of the article to be covered, but for an armchair about 2½-3 yards of wide material should be sufficient. *See* Brush.

DUSTPAN. The tin scoop with a handle into which dust is swept by means of a small brush is chiefly used for collecting the dust on stairs. The dustpan and brush have been largely replaced by the use of vacuum cleaners and carpet sweepers. *See* Carpet Sweeper. Vacuum Cleaner.

DUTCH AUCTION. This method of selling goods is the exact reverse of the one in ordinary use. A high price is first named for the article or property offered, and this is reduced by stages until a bidder is found. *See* Auction.

DUTCH CHEESE. A true skim-milk cheese, the Dutch product is mild in flavour and has many good points, although it is less nourishing than the whole-milk cheese, and is frequently a little salt. This class of cheese is best for keeping purposes, as it dries and hardens, whereas the rich, fatty varieties of cheese are prone to decomposition. Its shape and colour vary, some being round, others oval and either coloured a brilliant red or left yellow on the outside. *See* Cheese.

DUTCH GARDEN. With its trim and formal beds and borders, carefully trained yews and clipped dwarf box edgings, the Dutch garden has a charm of its own, and though no longer so fashionable as it was in the 18th century, many fine examples are still to be found in England, the result of generations of careful treatment. Directions and plans for laying out a Dutch garden are given in this article.

A Dutch garden should be enclosed by a clipped hedge of yew or box, and if possible laid in a position where it can be looked on from above. Planning the formation of beds and borders is a simple matter, with such a diversity of geometrical shapes available, among which, squares, circles, hexagons, and rectangular forms, such as those shown in the diagram, will be found most suitable. In the centre of the garden may be placed an ornament to which the beds converge, and this may take the form of a trained tree, a stone figure, a weeping or pillar rose, a sundial, a fountain, or a fine stone vase to be kept filled with seasonable bedding and bulbous plants. Crazy paths of York stone, having wide crevices between, planted with tufts of lowly plants, are very old-world in appearance. Well-rolled gravel will also serve.

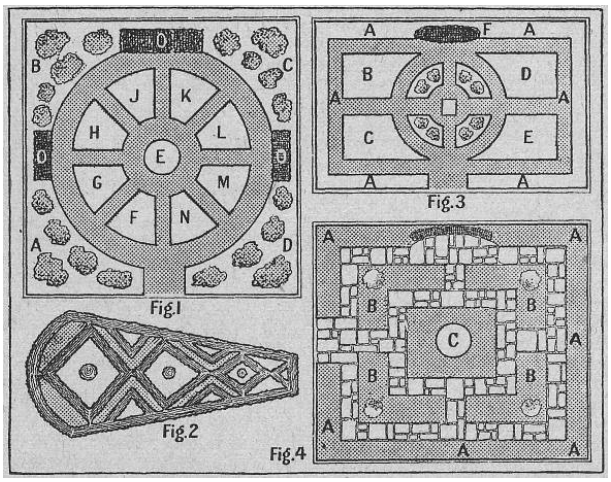
In planning the beds all angles and circles should be carefully pegged out with wooden stakes, and, as far as practicable, boards should be nailed against these to outline the shapes desired. Gravel should then be laid for the paths, and after this has been rolled thoroughly hard, the boards may be removed, and the beds filled to a proper level.

Box edging may afterwards be inserted, but it is advisable to use a garden line when planting to ensure regularity of outline. Although construction may be carried out at any time, autumn or spring is the best, as the dwarf box required for edging is then in suitable condition for planting. Clipping or training of the box is best performed during May, and after planting due attention must be given to watering until the roots have taken hold of the soil.

The Dutch garden is usually planted with low-growing plants which do not obscure the lay-out. A modern variation, now more popular, is the Formal Garden in which free-growing plants are set in beds and borders of formal design.

Plans for the Gardens. The accompanying plans suggest four arrangements for typical Dutch formal

gardens. The first example would result in a charming old-world garden.



Dutch Garden. Figs. 1-4. Plans of examples of formal gardens, the laying out and planting of which are described in the text.

FIG. 1

Corner beds, A, B, C, D, cabbage, Provence, damask, and China roses.

Centre bed, E.-—A sundial surrounded with clumps of southern-wood, thyme, or marjoram, with viola Maggie Mott planted between.

Outer beds.—F, white flowers; G, red flowers; H, yellow flowers; J, blue flowers; K, white flowers; L, red flowers; M, yellow flowers; N, blue flowers.

O.—Seats or arbours of clipped yew.

FIG. 3

Outer border A.—Mixed snapdragons.

B to E.—Beds of mixed perennials and annuals.

Inner beds.—Roses carpeted with violas.

Centre.—Weeping or pillar rose, sundial, or clipped tree.

F.—Seat or arbour.

FIG. 4

A paved or red-tiled garden of angles.

AA.—Mixed border of hollyhocks, sunflowers, paeonies, larkspurs, lupins, and other tall-growing or bushy plants.

BB.—Mixed beds of annuals and perennials, with a rose, paeony, or shaped tree planted at about the centre of each angle.

C.—Pillar rose with carnations and violas.

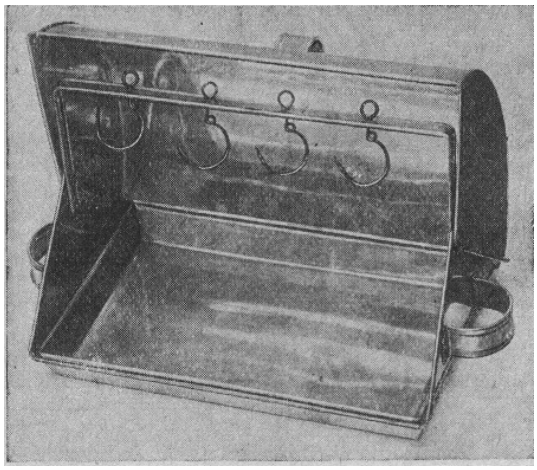
In this plan an edging of Mrs. Sinkins pink is suggested in place of the border of dwarf box.

Fig. 2. displays a somewhat elaborate and not uncommon type of bed. The darkest portions show the inner and outer edgings of dwarf box, the tinted parts signifying gravel and the white spaces where flowers are to be planted around dwarfed shaped trees. Such beds entail hard work and great attention if they are to be successful; but the result is well worth the trouble that has been taken. *See* Crazy Paving; Garden; Path; Tile.

DUTCHMAN'S PIPE. Popular name of a very vigorous hardy climbing plant valued chiefly for its large leaves, Aristolochia sipho. The curious shape of the small brownish flowers has given rise to the popular name. Some of the hot-house kinds of aristolochia have evil-smelling flowers of extraordinary appearance.

DUTCH METAL. This is a copper zinc alloy with a high proportion of copper; it is so ductile that it can be worked down to a thickness comparable to that of gold leaf. This fact, coupled with its yellow colour, leads to its use as a cheap substitute for genuine gold leaf in gilding work; it is also sometimes used in powder form for so-called gilding.

DUTCH OVEN. Formed like a miniature roasting screen, the Dutch oven is made to fasten on to the bars of an open grate or range. It is fitted with two or three meat hooks at the top, under the hood, and contains a dripping pan below, which is supported on iron rests. The oven is designed to enable a small joint or fowl to be cooked in front of the fire when other means of roasting are not available.



Dutch Oven. Useful roasting contrivance in metal, provided with four meat hooks and dripping pan.

The fire should be clear and the suspended meat must be turned and basted precisely as if cooked on a spit. This method, if properly carried out, gives the joint the same flavour as if roasted in the old-fashioned way. It is really a form of toasting or grilling. A Dutch oven may also be used for cooking chops, steaks, bacon, or fish, and it is adapted for browning the top of macaroni cheese, scallops or other savouries. For this purpose the dishes should be rested on the dripping pan.

For those persons without a kitchen range or gas cooking stove the Dutch oven presents a solution of the difficulty of roasting, but it must be kept scrupulously clean. It should be scoured in the same way as tinware. *See* Roasting.

DUVETYN. The cloth known as duvetyn derives its name from the French word for down, duvet, and

it emulates the downy softness of peach skin or the skin of young animals. Silk duvetyns are the best known, and their surface approaches that of hatter's plush. Ornamented with stencilling or embroidery this cloth is suitable for such articles as blotters and floor cushions.

DWARF BEAN. The French or dwarf bean is one of the best summer vegetables. The pods, which should be gathered while the seeds are immature, are of more delicate flavour than those of the runner bean. Deeply dug and manured soil is necessary to ensure good crops.

Seeds may be sown out of doors at fortnightly intervals from early May until the middle of June to provide a succession of produce in late summer and early autumn. The seeds should be set about 3 inches apart and 1-2 inches deep. The seedlings must be thinned out so that they are 9 inches or so from each other. The rows ought to be 20-24 inches apart. Canadian Wonder is a good variety, though most seedsmen sell their own special sorts.

Early crops of dwarf beans under glass are obtained by sowing the seeds at intervals in August and September in 8 inch pots filled with loamy soil, keeping them in a frame until October and then placing them under glass in a temperature of 55 to 60 degrees.

The climbing French bean, which needs the same treatment as the dwarf kind, provides pods of excellent flavour throughout many weeks. It is less vigorous than the runner bean. Tender and True is one of the best varieties.

The waxpod or butter beans are grown for the sake of their pale yellow pods, which are cooked without being sliced; both dwarf and climbing types are available and they need the same treatment as advised for French beans. Mont d'Or, climbing, and Golden Waxpod dwarf, are favourite varieties.

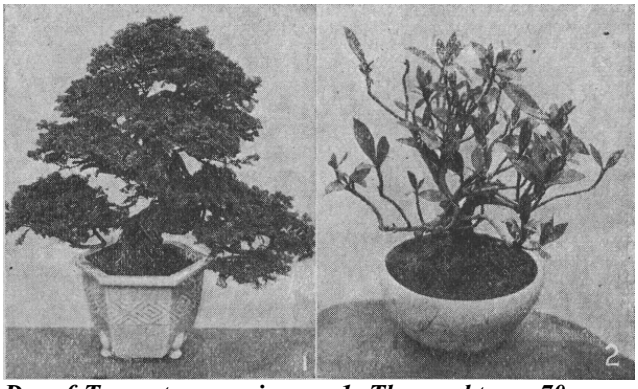
The ordinary runner bean can be grown without sticks if the ends of the shoots are pinched off frequently; the plants thus remain dwarf and become well branched. They cover a good deal of ground, and it is necessary to support them with short sticks to keep the pods off the soil. *See* Bean.

DWARF TREES. The miniature Japanese trees of larch, orange, maple and various evergreen conifers have become popular in Great Britain and are imported in considerable numbers. Some of those exhibited are said to be over 100 years old, yet so restricted are the roots that they remain dwarf and the stunted branches give them a very picturesque appearance.

The trees may be grown in a room window or unheated greenhouse, but they need careful treatment to preserve them in a healthy condition. Incorrect watering is likely to affect them adversely. The soil should be watered only when it is moderately dry, but sufficient water ought then to be given to moisten the soil thoroughly. If the soil is kept in a sodden state or if it is allowed to dry out, the trees are certain to suffer. They must be placed in a light position though not in strong sunshine. Gas-heated or gas-lit rooms do not suit them. Every year it is advisable to take off some of the surface soil without damaging the roots and to replace it with fresh compost of loam and a little sand.

During mild weather in spring and summer the trees benefit by being placed out of doors, for they are hardy trees. Branches which tend to spoil the symmetry of the trees should be shortened whenever necessary. If a tree shows signs of ill-health it should be turned out of its pot, the latter being scrubbed clean and provided with adequate drainage. The tree should then be repotted in loamy soil containing sand and a little crushed charcoal.

Miniature trees can be grown at home by setting seeds of various trees in pots, repotting them seldom, and pruning the branches to force the trees to grow in the shape desired.



Dwarf Trees: two specimens. 1. Thuya obtusa, 70 years old, 30 inches in height. 2. Miniature orange, 15 years old, 6 inches high.

DYEING FABRICS AT HOME

Hints on an Economical Form of Domestic Renovation

By following the instructions given in this article clothes and furnishings can be tinted not only in one but in two colours. Consult also the entry Colour Schemes, etc.

The many varieties of dyes on the market prove the popularity of home dyeing. Articles, both of dress and household hangings, may become faded and shabby a considerable time before they are worn out. With the expenditure of a little money, time, and trouble they can be renovated by tinting to match their original colour, or the colour may be entirely changed. One immersion in a dye bath completely recolours articles of plain material. Patterned fabrics may require two immersions or even three before the pattern is quite hidden by the new colour.

The usual forms in which dyes are sold are cakes, flakes, powders and, tubes of paste. Some are soap dyes, the dye being intimately mixed with soap, others are merely colouring matter put up in convenient forms for use.

Cold water dyes are chiefly used for giving pale and

delicate colours to fabrics of fine textures such as silk, muslin, etc. Some dyes are prepared for woollen and silk fabrics, some for cotton and linen, the reason being that animal fibres take dyes differently to those made from vegetable fibres. If a cotton and wool mixture fabric is to be dyed, choose a cotton dye, because wool will take a cotton dye, but cotton will not take a wool dye. Buy plenty of dye. It is far better to buy one packet too many than not enough.

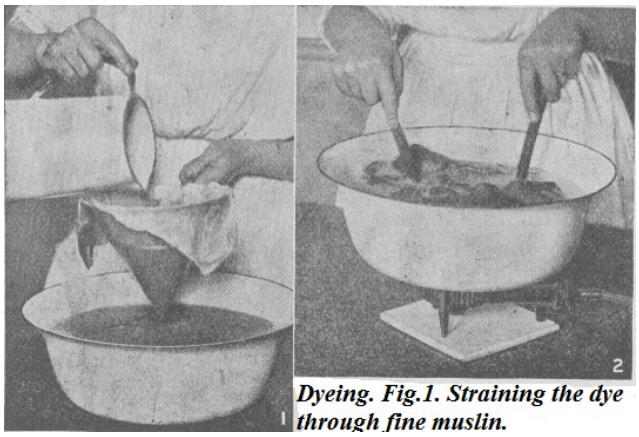
Initial Preparation. Before commencing, remove all buttons, buckles, bead or other trimmings, which obviously could not be expected to dye satisfactorily. Any stitched-down parts, such as turned-back cuffs, collars, hems, revers or pleats should be unpicked. This allows free access of the dye solution to all parts of the garment. Thoroughly wash every article before attempting to dye. This particularly applies to new materials; any starch remaining in the fabric will prevent the dye taking evenly. Grease and dirt act in the same way. Although the directions on a few soap dyes distinctly state that previous washing is unnecessary, good results must not be expected if the washing is neglected. It is a well known fact that a really dirty garment is not thoroughly cleaned by simply immersing it in hot soapy water. Rubbing or friction of some kind is essential. Further, any dirt coming from a soiled article when mixed with the dye solution will naturally prevent the dye giving such a clear or brilliant colour.

Weigh the articles carefully before making the dye solution; this avoids waste, and ensures sufficient solution being ready. The directions supplied with some makes do not state any definite weight that can be dyed, but only how much solution can be made from the packet. In these circumstances individual judgement must be used, remembering that a small thick article, especially of wool, will often require much more liquid than a large one of fine texture.

Method of Dyeing. For the dye bath choose a basin or washing tub large enough to take the article to be dyed conveniently. The utensil selected, if required for cotton goods, must be capable of being heated over the fire. White enamelled iron ware is the most suitable. Ordinary china basins can be used for all dyeing that does not actually require to be boiled.

Make sufficient dye solution not only to cover the fabric easily, but to allow room for stirring and moving the article about. All dyes, whether soap dyes or not, should be completely dissolved in boiling water. If the packet is hard it requires to be shredded or crushed. Should the dye not dissolve easily, place it in a small enamelled jug or basin and boil for a few minutes. When quite dissolved strain the concentrated dye through muslin into the dye bath (Fig. 1), and dilute with water. Before adding the material, test for colour by dipping a small piece of the same material into it. If this is not possible, take a small piece of fabric resembling the article in colour, and texture. Rinse well and dry; if the result is satisfactory, it is safe to proceed. If a deeper or paler tone is required, more dye or water must be added.

Should the test not give the exact colour, try judicious mixing of one or more colours until the desired shade is obtained. Most makers prepare dyes for sale in about 20 different shades, but by mixing these a much greater number of colours can be produced. Details about the particular dye are printed on the package and directions should be carefully read. When the dye bath is ready, open out the article, which has been previously washed and rinsed, but not dried, and place it in the solution. Use two smooth wooden sticks or spoons (Fig. 2) to move the fabric about. On no account should the dye bath be left, as it needs constant stirring whilst being heated. Unevenness of shade may result from carelessness at this stage.



Dyeing. Fig.1. Straining the dye through fine muslin.

Fig. 2. Two wooden spoons are used for stirring the dye bath.

Most makers advocate the use of salt, some also of vinegar. Salt is particularly useful when dyeing cotton goods, as it enhances the depth and brightness of the colour. The average time required to dye is from 10 to 40 min., according to the tone required, deep shades requiring longer than pale ones. Navy blue, for instance, would require 40 min., while a pale blue would be dyed in 10 min.

The dyeing completed, the colour must be fixed by thorough rinsing in several changes of co1d water, until no colour comes from the newly dyed article. A certain amount of unabsorbed colour is always lost in rinsing, and this must be taken into account when preparing the dye bath. Wring the article lightly and hang it out to dry, taking care to put the pegs in some inconspicuous part. When nearly dry take the article from the line and roll it up ready for ironing.

Delicate fabrics such as georgette or chiffon do not require to be hung up; any surplus moisture can be removed by rolling the garment in a clean cloth. Such materials and certain crêpes are apt to shrink after immersion in hot dye. They should be pulled into shape during the ironing process while the fabric is still damp. When ironing newly dyed material protect the ironing sheet from stain by placing a piece of muslin or thin cotton between the sheet and article being ironed. If much dyeing is being done, it is advisable to wear a rubber apron. Rubber gloves are useful when rinsing

after dyeing dark colours, such as black or dark brown, as there is sometimes sufficient dye in the first rinse waters to stain the hands. Lemon juice will usually remove such stains, or an application of peroxide of hydrogen.

Skilled treatment is required for such articles as suède, kid, or buckskin shoes or gloves, furs, carpets, rugs, waterproofs, overcoats, woollen costumes, or any heavy garments having interlinings and paddings, and the dyeing of these should not be attempted at home.

Knot Dyeing. Certain articles such as straight scarves, unlined curtains and cushion squares, made of thin fabrics, can be decoratively treated in two harmonious colours by means of knotting after having first been dyed in the ordinary way. The article should be rinsed and then knotted tightly in the middle with smaller knots at each corner, or—as in the case of curtains—at each lower corner. The knotted fabric is then dyed in a second deeper colour in the same manner as before, rinsed and unknotted. The two colours will blend into each other with a pretty shaded effect without hard lines of division between the tints.

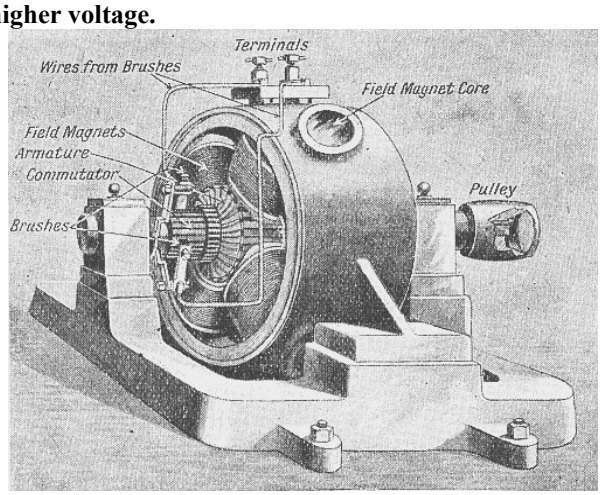
Should it be wished merely to give a contrasting border effect—to a scarf, for instance —the article may be tightly bandaged with cotton rags, after the first dyeing and rinsing have been accomplished, leaving exposed for the second immersion only the ends. The scarf is then simmered as before, rinsed, and the bandaging removed before drying and ironing. This method of dyeing gives a charming effect to short curtains made of natural shantung silk.

DYNAMO: Working Principles. The dynamo is a machine employed for converting mechanical energy into electrical energy, and consists essentially of an armature rotated in a magnetic field.

The general arrangement of a dynamo is shown in the diagram. The magnetic field is produced by a cast iron frame or yoke into which are fixed an equal number of iron poles, each pair being diametrically opposite. Upon each pole is mounted a magnetizing coil, the coils being so connected as to influence each alternate pole as a N. pole, and each intervening pole as a S. pole. The yoke is necessary to provide a path for the magnetic lines of force outside the armature, while the magnetic circuit is completed across the air gaps between pole tips and armature. The armature takes the form of a cylindrical iron structure mounted between bearings. Electrical conductors are carried by this structure, each cutting the magnetic lines of force as the armature rotates, with the result that a relatively small electric current is set up in each conductor. Upon the number of conductors, the number of magnetic lines of force produced by the field coils, and the speed of rotation depend the value of the electric current generated by the dynamo. The current is collected by the brushes from the commutator, a rotating contact device.

Any convenient mechanical power, such as a gas, steam, or oil engine, may be employed to rotate the armature, the important point being to have sufficient power at the speed necessary to enable the dynamo to deliver the voltage for which it is wound.

Types of Dynamo. Certain types of dynamo have been evolved for specific duties. Thus, the dynamo on a motor car has a duty different from that of the apparatus which is used for lighting a private house, while a dynamo for charging accumulators would not be suitable for lighting purposes, A charging dynamo delivers a heavy amperage at a low voltage, whereas a house lighting dynamo gives a lower amperage at a higher voltage.



Dynamo. General view of small dynamo showing commutator, armature, brushes, field magnets, and driving pulley.

Typical windings are the series, shunt, and compound respectively. In the series winding the armature conductors and the field coils form one continuous circuit, it being characteristic of this winding that the voltage varies as the load fluctuates. For this reason the series dynamo is not suitable either for charging or lighting. In the shunt winding the armature conductors and the field coils form two separate circuits, and a hand-operated regulating resistance is introduced into the field circuit. The purpose of the latter is to control the voltage generated in relation to the load fluctuations plus the voltage drop due to the heating of the coils. Within well defined limits a shunt wound dynamo can be considered a constant voltage machine. The compound method of winding combines both series and shunt. Its utility lies in the fact that it accommodates itself to load fluctuations by virtue of the series winding, which increases the magnetic field as the load increases. Such a machine is excellent where the current demand varies within fairly wide limits. Details of the windings and the speed of the dynamo should be found on the maker's plate fixed to the machine.

A dynamo to give the best results must be properly installed upon a sliding base fixed to a firm foundation. The sliding base enables the machine to be properly lined up with the engine, and allows the driving belt or chain to be adjusted to a nicety. A dynamo bolted direct to an engine shaft through a coupling is said to

be direct driven, and when once lined up needs no further adjustment.

It is important to house a dynamo in a dry place, as damp has a detrimental effect upon the insulation and may cause "earthing" troubles. Dust also should be kept away from the machine. If fixed on a wooden floor, a thick bed of incombustible material, such as asbestos, should be placed beneath the dynamo to insulate it. All wires and connexions must be properly protected, as, for example, by enclosing them in steel tubes, or in any manner that will ensure them being out of the way of gas-pipes, a hot flue, or heat or acids that might tend to destroy the insulation.

Regular attention has to be paid to replenishing the oil boxes. The used oil should be drawn off and replaced with a fresh supply, No oil must get on any part of the insulation, as oil is a solvent of rubber, and if it be allowed to get on the rubbered wires the rubber will perish, and ultimately cause a failure.

Commutator and Brushes. The commutator and brushes give the most trouble, and should be regularly inspected. When in good order there should be no sparking at the points of contact. The contact face of the brush should be of the same curvature as that of the commutator, and this can be ensured by placing a piece of glasspaper between the brush and the commutator and then rocking the latter so as to rub the paper on the brush and thus shape it to the desired curve. This applies to the usual carbon type of brush; those made of copper gauze are shaped with a very fine file and emery paper. In either case see that there are no loose ends to cause sparking.

The pressure of the brush on the commutator should be adjusted if requisite, by altering the tension of the springs. The rocker arms should be properly spaced, two being diametrically opposite, and four spaced at 90° apart. A slight movement of the rockers will often correct sparking and ensure perfect running, but this can only be determined by trial The commutator should not be lubricated. When all is in good order it should be a dark coppery colour; if blackish it indicates that the brushes are too soft. A bright and scraped appearance indicates either that the brushes are too hard or the pressure is too great.

DYSENTERY. Under this name are included several forms of intestinal inflammation. In hot countries cases are constantly cropping up. In Great Britain epidemics are not infrequent in asylums and other institutions.

The disease is spread by germs in the excreta of a patient suffering from the disease finding their way either into food or drinking water. This may happen in several ways. Flies may feed on infected excreta and then defile food, beverages, or food utensils. Infected excreta may be drained into shallow wells or washed into surface water. This water may be drunk or used for washing raw food, e.g. salad or food utensils. Raw food may be infected by polluted soil, and not washed clean. Persons found to be carriers of the disease frequently have been amongst those handling food, e.g. cooks, waiters, nurses, etc.

There are two main forms of the disease: bacillary and amoebic. For one or two days an attack may resemble ordinary acute diarrhoea, and then the stools are found to contain mucus (slime) streaked with blood. Soon the motion may consist of mucus and blood only. There may be severe straining and griping pains, The patient may die from weakness or from perforation of the bowel, or may become the subject of chronic dysentery.

The patient should be put to bed at once between hot blankets and have a hot-water bottle at his feet. The abdominal pain will be relieved by hot fomentations. He may have whey or albumen water at 4-hour intervals. Arrowroot may be useful. In the bacillary form 1 dram doses of sodium sulphate should be given every hour till the straining is relieved, and then at less frequent intervals. The doctor will treat bacillary dysentery by injections of anti-dysenteric serum and amoebic dysentery with emetine.

Preventive Methods. The stools of the patient should be mixed with a disinfectant before being disposed of, preferably by burning. Efforts should be made to diminish the number of flies. No food or beverage should be left without a cover if flies are about. All water for drinking or washing food or food utensils should be boiled or otherwise sterilized, unless it comes from an unimpeachable source. The hands should be washed thoroughly before partaking of food. Salads should be avoided, and care should be taken to prevent chills and to correct constipation and diarrhoea (q.v.).

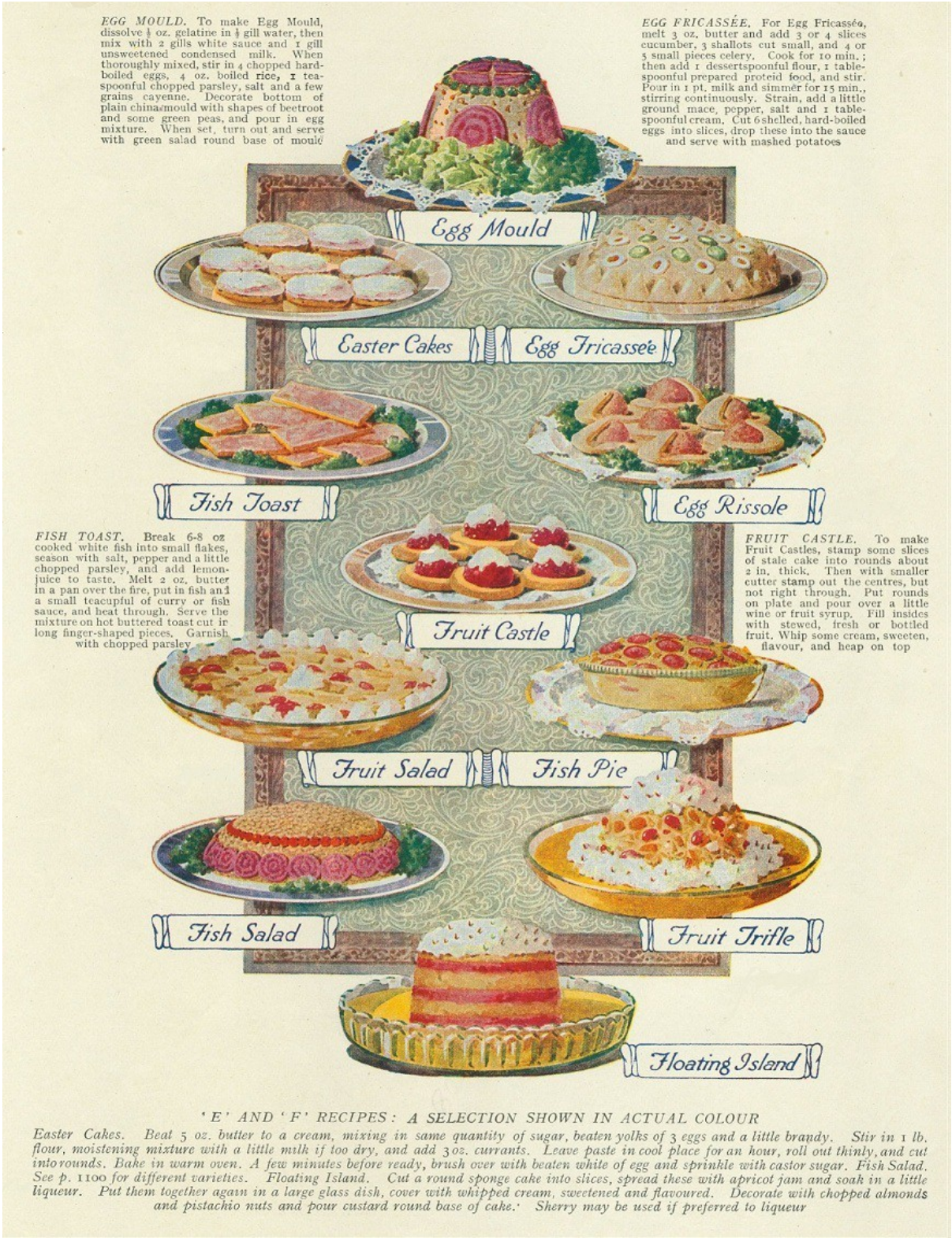
DYSMENORRHOEA. Pain occurring at the menstrual periods in women and girls, and felt in the lower part of the abdomen. It is always more or less disabling, and may be very severe. The causes are numerous, but always include some abnormality in the sexual organs.

The patient's general health is important. Iron in some form will be necessary in anaemia. Constipation must be corrected. If the pain is severe the patient should remain in bed, and the abdomen and feet should be kept warm. Much relief may be obtained from hot mustard hip baths or foot baths. Aspirin, grains 10, or phenacetin, grains 7, with citrate of caffeine, grain 1, may be given to a woman, and will frequently lessen the suffering. Alcohol in any form should never be given.

Dyspepsia. *See* Indigestion.

EAR: Anatomy and Diseases. The human ear is divided into three parts —the external, the middle, and the internal ear. The first consists of the auricle or pinna, the ear in the popular sense, and the external auditory meatus or passage which runs 1 ¼ in. inwards from the earhole and ends at the tympanic

(Continued in page 728)



'E' AND 'F' RECIPES: A SELECTION SHOWN IN ACTUAL COLOUR

Easter Cakes. Beat 5 oz. butter to a cream, mixing in same quantity of sugar, beaten yolks of 3 eggs and a little brandy. Stir in 1 lb. flour, moistening mixture with a little milk if too dry, and add 3 oz. currants. Leave paste in cool place for an hour, roll out thinly, and cut into rounds. Bake in warm oven. A few minutes before ready, brush over with beaten white of egg and sprinkle with castor sugar. Fish Salad. See p. 1100 for different varieties. Floating Island. Cut a round sponge cake into slices, spread these with apricot jam and soak in a little liqueur. Put them together again in a large glass dish, cover with whipped cream, sweetened and flavoured. Decorate with chopped almonds and pistachio nuts and pour custard round base of cake. Sherry may be used if preferred to liqueur

'D- RECIPES : A SELECTION SHOWN IN ACTUAL COLOUR

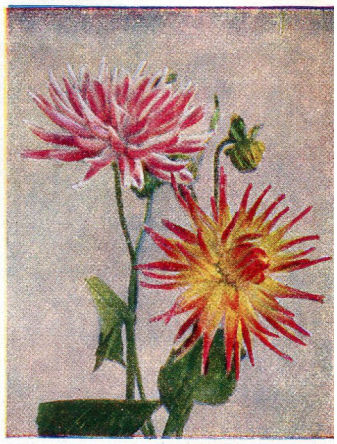
Dresden Creams. Whip ½ pt. cream and divide into 3 portions. To one add strawberry jam rubbed through sieve, 1 oz. castor sugar and juice of ½ a lemon, also 1 or 2 drops of cochineal. Portions 2 and 3 are flavoured with coffee essence and vanilla respectively, and sweetened with castor sugar. Put layers of the 3 flavours on broken macaroons arranged in soufflé cases. Deception Cakes: Cut some puff pastry into rounds, cover half of them with currants; sprinkle over sugar and a little grated nutmeg, and add a few drops of brandy. Cover with remaining rounds. Brush with white of egg and sprinkle with sugar. Bake in oven. Damson Cream Ice: Made as strawberry ice with damsons substituted for strawberries.



Single, "Cardinal" (top) and "Mrs. Joynson Hicks"



Collarette, "Lochnagar" (top) and "Skerryvore"



Pompon Cactus, "Goldfinch" (left) and "Modesty"



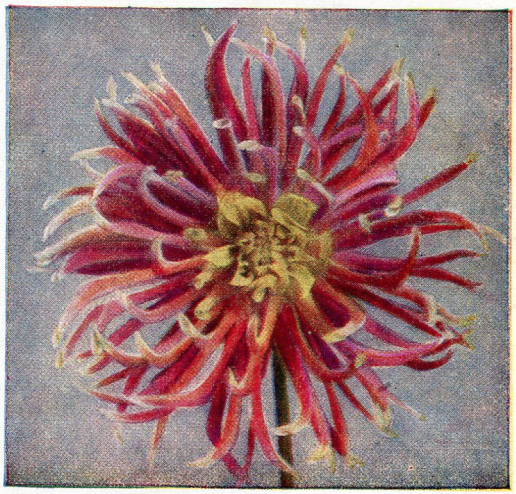
Peony-flowered, "The Geisha"



Fancy, "Mrs. Saunders"



Star, four varieties of "Crawley Star"

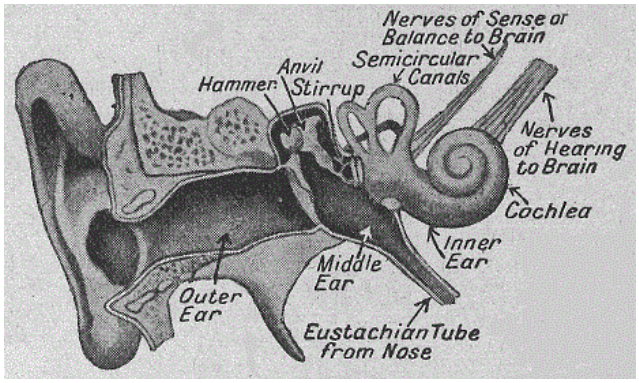


Cactus, "Mrs. Randle"

DAHLIA: COLOUR AND FORM IN SEVERAL STANDARD VARIETIES

or drum membrane stretched across the passage. Sound waves entering the passage strike against the membrane and cause it to vibrate.

The middle ear lies inside the membrane. Its chief contents are the ossicles, three tiny bones which connect the drum with the actual hearing apparatus, or internal ear. In the posterior wall of the middle ear there is the opening into a small passage leading to the mastoid antrum, a hollow space in the mass of bone to be felt immediately behind the ear. In suppuration of the middle ear infection may thus pass through and cause mastoid disease. In the anterior wall there is the opening of the Eustachian tube, which leads directly to the back of the throat. The importance of this tube is that through it air can find its way into the middle ear, so that the air pressure on the two sides of the drum is always kept the same. The deafness so commonly noted in chronic catarrh of the nose and throat is generally due to the catarrh spreading up the Eustachian tube and closing it.



Ear. Diagram showing anatomy of the outer, middle and inner parts of the ear.

The internal ear or labyrinth is divided into three parts: the cochlea, the true organ of hearing, in front; the semicircular canals, which control balance, and the vestibule, between these others.

Sound vibrations can reach the inner ear otherwise than through the air. Thus if a tuning-fork is sounded and the end of the handle placed on the bone behind the ear or elsewhere on the skull, the note will be clearly heard if the internal ear is healthy. If it is not heard we imply that the patient suffers from nerve deafness due to disease of the internal ear or the nerve connecting it with the hearing centre in the brain. The tuning-fork will be heard distinctly, however, where the deafness is due to blocking of the external passage, as by wax, or to disease in the middle ear causing stiffness or destruction of the membranes and the conducting bones.

Discharge from the ear is most commonly due to inflammation of the middle ear, with the formation of matter which escapes through a perforation in the drum-membrane. This condition is a frequent complication of the convalescence of measles or scarlet fever in children, or it may result from simple cold in the ear. The treatment of discharge coming from the middle ear must be supervised by a doctor.

Perforation of the drum membrane may be caused by some sharp instrument poked into the ear, or by the impact of water in diving, etc., but most commonly it is the result of middle ear inflammation. The ears should be protected in high diving by plugs or otherwise. It is a dangerous practice to box children's ears, as this is a frequent cause of perforation of the drum membrane.

A foreign body in the ear may be a living insect or something which has been pushed in. It is safer to have it syringed out by the doctor, and the sooner the better. If it is a pea or a bean, no one should be allowed in the meantime to put water in the ear, as this causes these to swell and renders their removal more difficult.

On no account should attempts be made to remove a foreign body with a hairpin or other instrument.

Mastoid disease is most usually due to infection from the middle ear through the opening above mentioned. The symptoms are sudden fever, pain behind the ear, shooting over the head and down the neck, swelling, redness and tenderness on pressure on the bone behind the ear, and usually a profuse discharge. Suppuration occurs in the spaces within the mastoid process, and as the pus cannot readily escape through the narrow opening into the ear or through the hard bone on the surface of the mastoid, it tends to turn inwards, and may produce meningitis or abscess of the brain. Early surgical treatment is imperative.

Noises in the ear may be the result of a large number of causes, e.g. chronic inflammation of the middle ear causing partial deafness, certain drugs, such as quinine, sodium salicylate, etc., catarrh of the nose and throat, etc. Treatment will depend on the cause. Wax in the ears may be removed by gentle syringing as described under the heading Deafness.

Earache. This pain in the ear may be due to a number of causes. Among these are neuralgia, a boil in the meatus, impacted wax, the presence of a foreign body, or inflammation of the middle ear. Teething in children is another cause.

To relieve the pain, heat should be applied. A hot-water bottle may be covered with flannel or a shawl and laid against the ear, or a flannel bag may be made and filled with common salt which has been roasted on a shovel. This should be applied as hot as it can be borne. If, however, the pain is continuous, a doctor should be consulted.

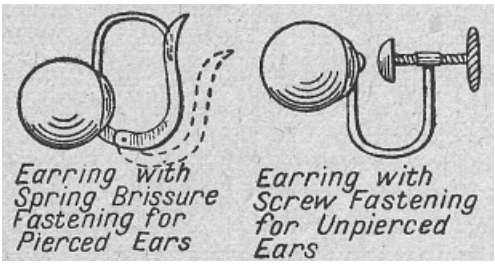
Ear Cap. The purpose of ear caps is to correct prominent ears in children. Made of mercerised cotton or of silk, they are worn round the head at night, being held in position by straps firmly but not too tightly tied. They can be obtained in most sizes from chemists, surgical instrument makers, and drapers.

EARLY CLOSING. In Great Britain, since the passing of the Shops Act of 1912, it has been compulsory for shops to close for one half-day a week. Earlier evening closing is governed by the Acts of 1922 and 1928. The hours per week for persons under 18 are

also limited and with certain exceptions, shops must be closed on Sundays.

The day chosen varies from place to place, being fixed by local authorities after consultation with the shopkeepers; but a shopper should acquaint herself with it in her own locality so as to avoid disappointment. In central London the early closing day is Saturday, but in other places it is more usually a day about the middle of the week, Wednesday and Thursday being the days that are most frequently selected.

EARRINGS: Choice and Care. While never quite out of fashion as ornaments, styles for earrings change frequently, especially during periods when women are wearing much fancy jewelry and new designs are evolved in keeping with various dress fashions. When long earrings are being worn, good examples may be purchased at shops which specialise in antique jewelry. Many such earrings are made in two parts, a top or stud and a long drop, or an intricately designed lower part, which hooks on to the upper part. These ornaments possess an advantage for those who do not care for elaborate earrings in the mornings as the studs can be used alone, the lower parts being added for formal wear.



Earring. Types of fastenings for both pierced and unpierced ears.

The two main types of fastening for earrings are illustrated, the first being suitable for pierced ears and the second for unpierced. The latter type are attached by means of screws to the lobes of the ears. They should be light in weight or they are liable to drag the lobes and either to hurt or to be lost.

Fastening Methods. The fastening of valuable earrings should never be of the type which screws on the lobe of the ear. It causes unbearable discomfort if the fastening device is screwed so tightly to the ear as to prevent the possibility of the ornaments falling off. Those who possess diamond or other valuable earrings should have the lobes of their ears pierced. This can always be done by a practical jeweller without any risk and with very little pain.

Before purchasing earrings inquiries should be made as to whether the wires or fastenings are of silver or gold. The less expensive varieties may have metal fittings which might possibly poison the ear, though the extra cost of silver is infinitesimal. For safety when wearing earrings the style of fitting that is most reliable is what is known as the Brissure fastening. This is an old French style, consisting of a wire which, when passed through the ear, is covered by means of a grooved loop of gold or silver affixed to the ornament by means of a spring hinge. Withdrawal of the wire from the lobe of the ear is thus rendered impossible without the hinged loop being first opened so as to uncover the ear wire at the back of the ear.

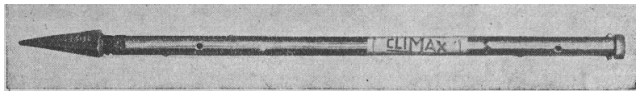
EARTH: In Electrical Work. Any part of an electrical circuit which is connected to the ground or earth is said to be at earth or zero potential.

A good earth system is very necessary in wireless reception, although many modern sets dispense with the traditional type of external earth wire. It is immaterial whether the earth wire is bare or covered, but it should be of a substantial cross section; copper aerial wire, 7/22 gauge, is suitable. A main water pipe makes a satisfactory earth, provided the earth wire can be attached close by the point where the pipe enters the ground. If, for example, the set is to be used in a room at the back of the house, the earth wire can be joined near the tap in the kitchen or scullery. The lead pipe should be scraped clean and bright for a distance of about one inch, and an earthing clip attached. The earth wire from the set is then connected to the terminal which is provided on the clip.

Gas pipes make unsatisfactory earths, owing to the fact that high resistance joints are employed. Moreover, considerations of safety make it undesirable to utilise a gas pipe for this purpose.

If the receiver is not conveniently placed in relation to the main water supply, a buried earth may be employed. The earth wire is soldered at several points to a large sheet of zinc or copper, which is buried edgewise in damp soil to a depth of about three feet. After cleaning off any excess flux with methylated spirit or petrol, it is advisable to protect the joint with a coating of paint in order to prevent corrosion.

An alternative to the metal earth plate is an earthing tube, which is driven into the ground and has a terminal at the top to which the earth wire is attached. Besides this connexion it is as well to lead the bare wire down through the tube, and out through one of the holes near the bottom, where it may be soldered or otherwise attached to the tube. Earth tubes are usually perforated, and should be filled with water at regular intervals during dry weather to ensure satisfactory electrical connexion with the surrounding soil.

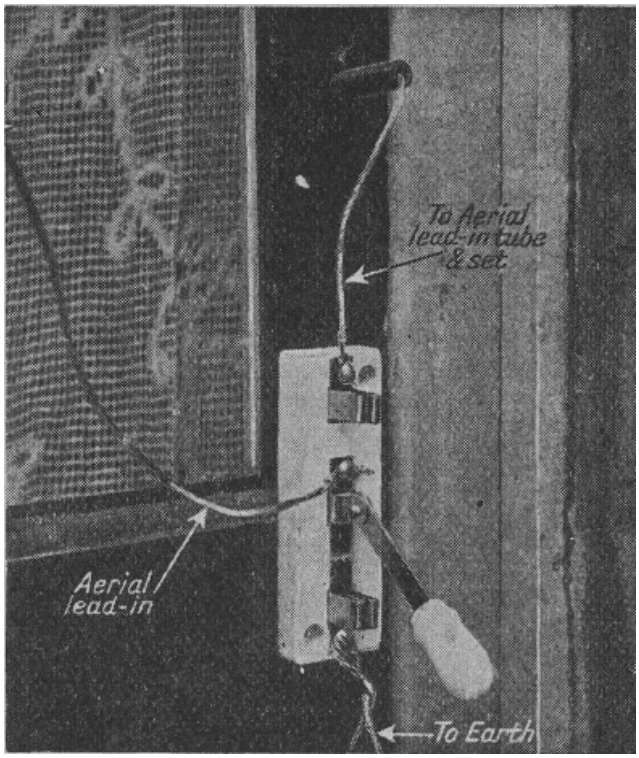


Earth. Copper earthing tube for connexion to a wireless set. In use it is driven into the ground.

A counterpoise earth is sometimes used for short-wave reception, and may comprise, one or more wires, running beneath the aerial and a few feet above the ground. The wires have to be insulated in exactly the same way as the aerial, and may be passed through an ebonite lead-in tube to the earth terminal of the set. If a decrease in volume or flatness of tuning is observed, it is as well to inspect the earthing system, making sure

that any terminals or other joints have not become dirty or otherwise defective. A faulty earth may also produce high frequency and low frequency instability. *See* Aerial.

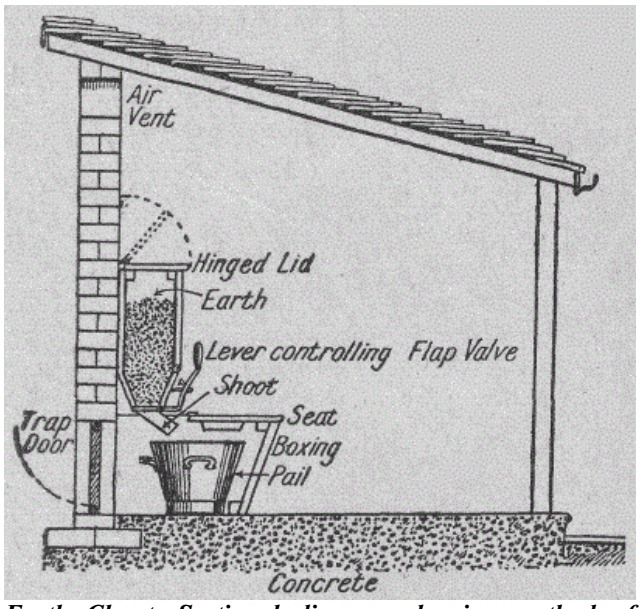
Earth Switch. This is a device for disconnecting the receiver and joining an outdoor aerial direct to earth, so that atmospheric discharges (e.g. lightning) flow straight to earth instead of passing through the aerial circuit of the set. A stoutly constructed single pole change-over switch having a porcelain base is suitable, and should preferably be mounted outside the house, near the aerial lead-in insulator. It is advisable to provide a cowl or other covering to prevent leakage of the aerial currents to earth over the surface of the switch in wet weather.



Earth. Aerial-earth switch, single pole change-over type. In this switch a simple form of lightning-arrester gap is incorporated.

The connexions are as follows: The aerial lead-in is joined to the centre terminal or arm of the switch. One side of the switch is then connected via the lead-in insulator to the aerial terminal of the set, and the remaining side is joined to earth. Thus in one position of the switch arm the aerial is connected to the receiver, while in the other position the aerial is joined direct to earth. The aerial should always be earthed when the set is not in use.

EARTH CLOSET. In country districts where no public sanitary arrangements exist, an earth or chemical closet, located in an outbuilding, takes the place of the town water closet. A simple form consists of a movable receptacle or pail beneath the seat. Dry loamy earth may be provided in a receptacle above the seat, feeding through a hopper to a shoot terminating above the pail at the back. A flap can be fitted to regulate the flow of dried earth, as shown in the figure above.



Earth Closet. Sectional diagram showing method of construction and hopper for earth supply.

The outbuilding for an earth closet can advantageously be built of brickwork and should be frequently lime-washed. A weather-boarded erection is cheaper, but the numerous crevices harbour a great number of insects. The floor should be of concrete raised three inches above the level of the ground, with a fall to the entrance door. The cheapness of the best earth closet system is a great recommendation, and if constructed to embody the foregoing features it will prove entirely satisfactory in country districts for a small-sized house.

It should be noted that dry loamy earth is the best material, as its deodorant properties are greater than those of ashes, etc. In fact, unless earth be used, the closet may be treated by local by-laws as a privy, with the result that more frequent cleansing is insisted upon. This applies particularly when a fixed receptacle is used. *See* Cesspool; Refuse; Sanitation; Water Closet.

EARTHENWARE. This term is used for household and other articles made of clay and similar substances. Glazed and unglazed earthenware of fireproof quality is largely used as a substitute for iron, tin, aluminium, etc., in the manufacture of saucepans and other kitchen utensils. It is easily kept clean and does not rust, besides which, as in the case of casseroles, the dish itself may be brought to the table. Earthenware utensils require no scrubbing or polishing, but should be washed in warm soapy water immediately after use. In case of stains, soak the pans in hot water to which a little soda has been added, or apply some fine sand; then rinse and dry thoroughly. *See* China; Crockery; Delft; Fireproof.

EARTHWORM. The ordinary earthworm is the friend rather than the enemy of flower gardeners, because of the work that it does in mixing and lightening soils.

Few people would object to worms in lawns but for the fact that at certain periods of the year there is a heavy crop of casts which entirely spoil the appearance of the grass. The application of worm killer (a preparation sold by seedsmen) which must be thoroughly watered in, will destroy the worms.

EARWIG. This pest damages the petals of dahlias, chrysanthemums, carnations and other flowers. Most damage is done while the gardener is sleeping. At dawn the earwig creeps into a place of refuge, such as a dahlia petal, into the openings of a sponge, a wisp of hay in a flowerpot or a hollow stem such as that of a dead sunflower. The gardener should, therefore, place one or other of the articles mentioned among his plants to serve as traps. In the case of sponge or hay, he immerses it in boiling water in order to kill the insects; if they are in hollow stems, he must either shake or blow the pests out into boiling water. The traps should be set in the plants in the evening and examined in the morning.

EASTER. This Christian festival falls in March or April. In England it has come to be a general holiday which includes Good Friday and Easter Monday, and often extends from Thursday evening until Tuesday oreven Wednesday morning. It is celebrated by the giving of Easter eggs, and sometimes by presents of other kinds, but is more popular as the first holiday season of the year.

For some years business men and others have carried on an agitation to make Easter a fixed date. A measure to this effect was passed into law in 1928, but it will not become operative until the Home Secretary makes an order to that effect. The Act fixes Easter Sunday as the Sunday immediately after the second Saturday in April.

The dates on which Easter Sunday falls during the ten years 1939-1948 are as follows:

1939	April 9	1944	April 9
1940	March 24	1945	April 1
1941	April 13	1946	April 21
1942	April 5	1947	April 6
1943	April 25	1948	March 28

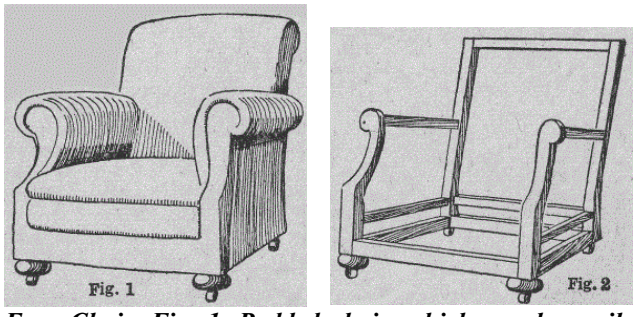
EASTER EGG. Among the less costly varieties of Easter egg are the small chocolate ones, either filled with cream and marzipan, to imitate the yolk and white, or hollow, and sometimes containing chocolate drops or other sweets. There are also fancy nests filled with eggs; the nests are usually made in cardboard or light basket work, and the eggs may be of almost any kind of sweetstuff.

For more costly gifts there are the large egg cases, made of painted cardboard, silk, satin, or some decorative material. These can be filled with a piece of jewelry, or with chocolates or perfume.

An Egg Hunt. An Easter egg hunt is an inexpensive way of entertaining children, the eggs being hidden in the garden. Small chocolate eggs about the size of a bantam's egg, and done up in silver paper, are most suitable, two or three eggs apiece being allowed. The hiding of the eggs in the garden should not be done too carefully, and a note should be kept of each place chosen, in order that any not discovered may be retrieved at the end and each child have a fair share. Clumps of rock plants or low growing shrubs offer excellent hiding-places. Two or three eggs may sometimes be hidden in the same place to look like a nest. The children should all start seeking at the same time, and the hunt should not last too long; in most cases half an hour should be sufficient. Should the weather be unfavourable the hunt may be equally well arranged indoors, where many ingenious hiding places are available.

EASTON'S SYRUP. Syrup of iron phosphate with quinine and strychnia, known as Easton's syrup, is an excellent tonic for convalescents in slight anaemia, loss of appetite, general debility, etc. A dose for an adult is ½ to 1 fluid dram in a little water. It can be obtained in tablet form in ½ dram and dram strength.

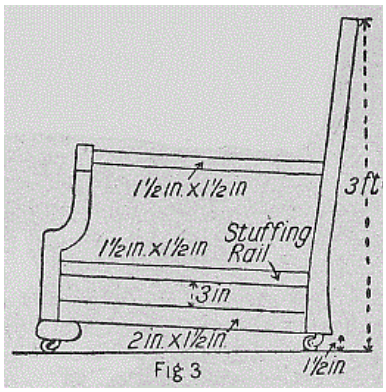
EASY CHAIR: How to Make. For making the framework for an easy chair such as Fig. 1, either beech or birch is a suitable wood, and the joints are the mortise and tenon in preference to dowelling. Fig. 2 is a perspective view of the framework, and the dimensions are indicated in the working drawings at Figs. 3-6. Set the job out to full size, as this will then show clearly the various angles at which the shoulders are cut. Fig. 6 shows how the back is marked out. The leg is tapered away at the bottom on the inner edge to the height of the stuffing rail, 6 ½ in., a piece being glued on at the back to take the shape.

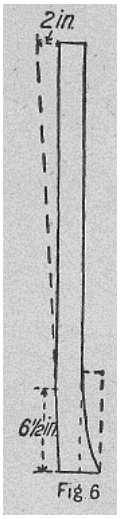


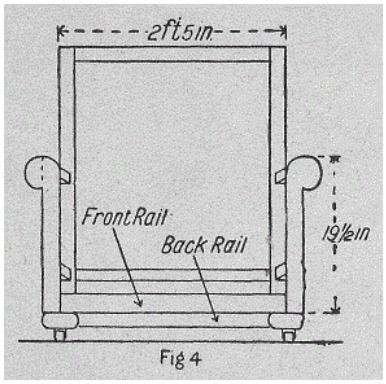
Easy Chair. Fig. 1. Padded chair, which can be easily made by the amateur. Fig. 2. Framework.

Economy may be exercised in cutting out the front legs. Two pieces of stuff are glued together, and the shape cut out afterwards. The scrolls at the top are obtained in a similar way. Having cut out all the stuff, the joints are marked out and cut, all the various lengths and sizes being obtained directly from the

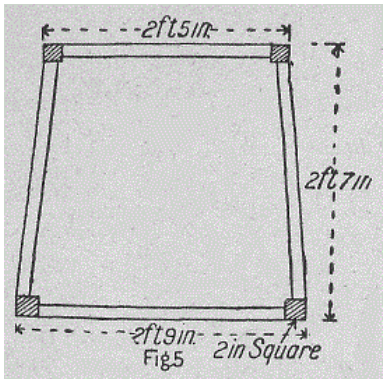
setting out. Glue the front and back up separately, and allow them to set before glueing the side rails. The joints may be further strengthened by pinning them with ¼ in. dowels. When the whole is glued up, all sharp edges must be removed with a rasp, and the bun feet fitted, with ¾ in. or 1 in. dowels. It is advisable carefully to stain and polish them before fixing.







Easy Chair. Figs. 3-6. Working drawings giving details and measurements of the framework of the chair shown in this and next page.



The fitting of the castors is important, as in the event of these becoming loose and sagging, strain is thrown on the joints of the framiug. Full instructions for the springing and covering of this type of chair will be found in the article Upholstery. *See* Armchair; Chair; Chair Bed.

EATING. The mastication of food is necessary for its thorough subdivision into small enough portions to make digestion easy. The operation should not be hurried, as it too often is, the ill-masticated food being swallowed by the assistance of draughts of liquids. This can be avoided by refraining from the use of liquids throughout meals. *See* Diet; Digestion; Drinking; Fish; Food; Fruit; Indigestion, etc.

EAU-DE-COLOGNE. There are excellent English makes on the market, or this perfume can be prepared at home if preferred. Care must be taken to procure the best rectified alcohol. The following ingredients are placed in an ordinary glass bottle.

Rectified alcohol	1½ pints
Essence of lemon	1½ drams
„ bergamot	1½ „
„ cedrat	1½ „
„ lavender	1½ „
„ rosemary	½ „
„ thyme	¼ „

The mixture must be well shaken until the essences dissolve in the alcohol. The liquid is then strained through a filter paper, which can be obtained from any chemist, and put into bottles with close-fitting stoppers.

The toilet uses of eau-de-Cologne are many. Rubbed into the palms of the hands after washing and drying them, it keeps them free from perspiration in hot weather. It is a good facial astringent for use about once a week. A pad of cotton wool should be squeezed out of cold water and then further moistened with eau-de-Cologne. The face should be briskly patted with this pad and then sponged with cold water. Skin food may be applied afterwards at night. Eau-de-Cologne is refreshing on a railway journey and, in addition, does much to alleviate a headache.

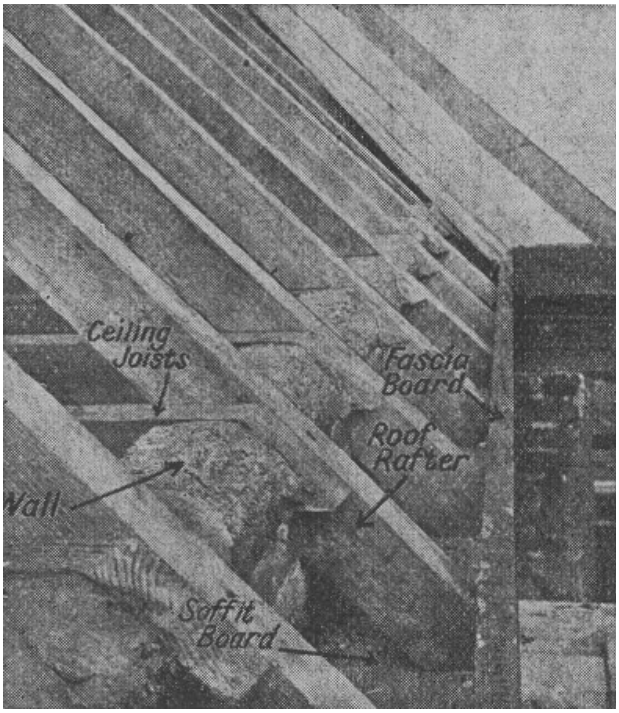
EAVES: Of a Building. Eaves constitute the lower portion of a sloping roof which projects beyond the wall of a house, making, with the aid of an eaves channel or gutter, an overhanging drip for rain water. A projection of 18 in., and in some cases from 2 to 3 ft. will not be too much. The advantage of wide eaves is that besides protecting the walls and upper windows from the weather, they give good shadows and thus remove the bleak appearance of a too rigid roof line.

In designing the eaves the questions of the indispensable gutters on the fringe and the down pipes must be studied. If the eaves are continuous along the front or side of a house—not broken, that is, by gables or other interruptions—the question of down pipes is greatly simplified. As regards gutters, the half-round variety is better than those with mouldings.

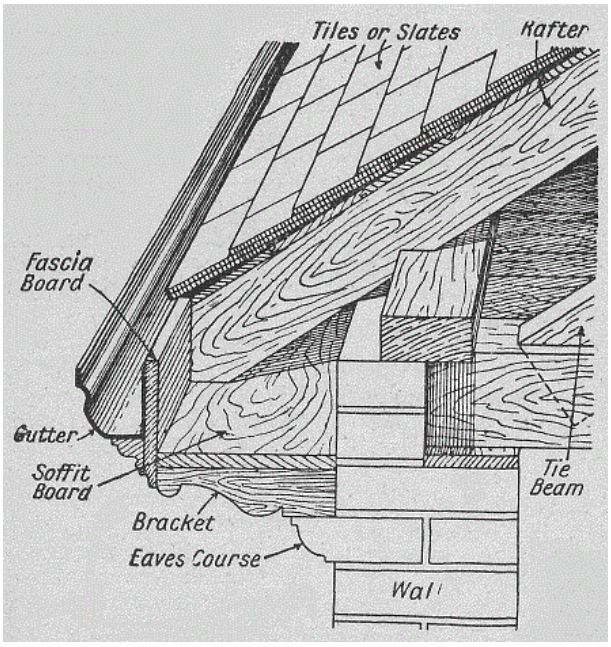
A simple form of eaves in course of construction is illustrated in Fig. 1. which shows very clearly the arrangement of the fascia board, as the vertical board is called, and the position of the soffit board, which isfixed in a horizontal manner to the feet of the roof rafters. This arrangement is very effective on cottage property. A convenient and economical scheme is to use a 4 in. fascia board, 1 in. thick, and a 6 in. soffit board, ¾ in. thick. These boards are fitted to the feet of the rafters by cutting the latter to shape, getting them all in line by stretching a cord between the end rafters and cutting all the rafter feet accordingly. The boards are then nailed securely to every rafter. The gutter, if of the O.G. type and, say, 4 in. wide, is then screwed directly to the front of the fascia, thus saving the expense of the usual gutter brackets.

A more elaborate arrangement is that shown in Fig. 2, where an eaves course of brickwork has been

introduced for the purpose of effecting a better appearance. The soffit is enclosed by a board supported on brackets. *See* Architecture; Bungalow; Cottage; House; Roof.



Eaves. Fig. 1. Showing how and where the fascia and soffit boards are fixed. This arrangement is particularly suitable for cottage property.



Eaves. Fig. 2. Section showing construction of a simple type with an eaves course of brickwork.

EBONITE. Ebonite is a hard usually black material made by incorporating rubber with other ingredients. It is amenable to a high finish, and has many domestic applications, examples being gramophone records, fountain pens, electrical apparatus, for which last named purpose it possesses good insulating properties. It is procurable in the form of rods, sheet or tubing from ironmongers and dealers in electrical apparatus.

Ebonite can be cut with a hack saw in the ordinary way. When drilling holes in it, the drill is apt to clog, and should be backed out frequently; soft soap can be used as a lubricant. Filing is best accomplished with very coarse or rough files.

EBONY: The Wood. There are several kinds of ebony, which is a hard, dense, and heavy wood, often quite black in colour. Generally the heartwood is black, or nearly so, and the sapwood yellowish grey or brown, or nearly white. The wood too is often streaked with shades of lighter or darker colour. Ebony is valued chiefly for its colour; it is used for veneer, for inlaying, for small turned articles, and for small cabinet work; being a scarce wood, it is often imitated. The artificial sort, sometimes known as German ebony, is mostly stained sycamore, pear, or boxwood, and is used for the backs of certain brushes of the cheaper sort.

Ebony furniture which has become dull and shabby looking may be restored by the application of olive oil. If it has lost its polish, it is best treated with a preparation consisting of vinegar 3 oz., linseed oil 6 oz., methylated spirit 3 oz., and butter of antimony ½ oz. *See* Wood.

ÉCARTÉ. This is a card game for two persons which is played with a piquet pack of cards. The rank of the cards is king (high), queen, jack, ace, ten, nine, eight, seven (low), the ace coming between the jack and the ten.

The cards are cut for deal, highest dealing, and five cards are dealt either three at a time and then two at a time, or vice versa. The 11th card is turned up as the trump; if it happens to be a king the dealer scores one point. After the trump has been turned up, the two placers look at their hands. If the dealer's opponent is willing to play his cards as they stand he says, "I play." If, however, he is dissatisfied with them and wishes to strengthen his hand by discarding and drawing, allowing the dealer the same privilege, he says, "I propose." The dealer may refuse, and say, "Play," or may accept, in which case he deals his opponent as many fresh cards as he discards. The dealer himself then may discard and refill his hand, and the players may repeat this procedure until one or the other declares his willingness to play.

Discarded cards are placed face downwards on the table, and are not looked at by the opposite player. If a player does examine such cards he may be called upon to play with his cards exposed, face upwards on the table. If a player asks for more cards than there are left in the pack he must take back into his hand enough cards from his last discard to fill his hand. Players may discard any number of cards up to five, and have their cards replaced by an equal number. If the dealer's opponent proposes and the dealer accepts them, the dealer's opponent must discard at least one of his cards.

Before leading a card, the dealer's opponent says, 'I

play," and thereafter the winner of each trick leads for the next trick. If a player holds a king and wishes to score it, he must announce it before any card is led, but he is not bound to announce or score it if he does not wish. Players must follow suit, and take the trick if possible. If a player cannot follow suit or take the trick with a trump, he discards. If he fails to follow suit or win a trick when he could have done, or trump when he could have followed suit, it is a "renounce," and the cards are taken up and the hand played again.

Scoring. Should a player thus renouncing take less than five tricks on the replay, he cannot score. If he takes five tricks he scores one point. Tricks are turned down as taken, and must not be examined afterwards during play. If a player throws down his hand as not being worth a point he cannot score, even though he would have won if he had played. If he puts down his hand and claims one or two points he may score them if his hand substantiates his claim.

The king of trumps turned up counts one point to dealer; held in the hand one point to holder if declared as already explained. Dealer's opponent who stands or dealer who refuses counts one point for taking three tricks and two points for five tricks, called vole. If a player stands or refuses and fails to take three or more tricks his opponent scores two points. The first player to make five points wins the game.

ÉCLAIR. The small finger-shaped cakes known as éclairs are prepared from choux pastry, the mixture used for making cream buns, etc. The top may be iced either with chocolate, coffee, or other icing, and the inside filled with confectioner's custard or whipped and sweetened cream. *See* Banana; Chocolate Éclair; Cream Bun; Custard, etc.

ÉCRU. Silk before it has been boiled and cotton and linen before being bleached are écru, which in French signifies the natural colour. Lace and curtain nets can be bought either in white or écru, implying in this case a slightly brownish shade.

ECZEMA: Its Treatment. The commonest of skin diseases, eczema is characterized by reddening of the skin, by little hard pimples called papules, and watery blisters or vesicles containing matter known as pustules. When the skin is raw there is a sticky discharge.

In the causation of eczema two factors that must always be looked for are external irritation and increased susceptibility of the skin. The external irritant may be something employed in one's occupation or hobbies, e.g. sugar in baker's eczema. It may be cold or heat, friction of clothing, or otherwise. Strong soap, cosmetics, tooth pastes, may produce eczema about the lips; decomposing sweat is another cause. Irritants may be brought to the skin by the blood.

Every effort should be made, by better personal hygiene in respect of exercise, sleep, fresh air, and diet, to increase bodily and mental tone. Alcohol in all forms must be given up. Sugar must be reduced. Tea and coffee should "be discontinued in acute eczema, and may have to be watched subsequently. Salted meats, pickles, chutney, and highly seasoned dishes must be avoided. It may be found best to restrict the patient to milk diet. Woollen underwear may have to give place to silk or cotton. Mild or super-fatted soaps should be used, and none at all in acute eczema.

For erythematous eczema or reddening, lotions or powders are applied, such as calamine lotion, or the following dabbed on and allowed to dry.

Zinc oxide powder	3 drams
Solution of lead subacetate	1 dram
Glycerin	1 „
Camphor water to make	6 oz.

A useful powder is made up as follows, and is dusted on to burning red areas occasionally:

Zinc oxide powder	2 drams
Talcum powder	2 „
Starch	4 „

Papules are usually found on the arms or legs. Burning is not so pronounced, but the itching is often intolerable. The lotions given above may be used, or the following ointment applied locally twice a day:

Carbolic acid	15 grains
Calomel	20 „
Zinc oxide ointment	2 oz.

When vesicles occur, the skin of the face, particularly in children, is the commonest site of this variety of eczema. The lotions mentioned above may be used, and when the discharge lessens, Lassar's paste, which is composed of zinc oxide powder and powdered talc, 2 drams each; vaseline, ½ oz.; salicylic acid powder, 10 grains. Pieces of lint or old linen are used, the paste being spread evenly all over. The dressing is changed when it becomes moist. For children, equal parts of zinc ointment and lanoline could also be applied in this way.

Making a Starch Poultice. To clean the parts and remove the crusts, gently sop off with a little cotton wool wet with olive oil. If the crusting is thick a starch poultice or diachylon ointment may be used. The poultice is made by making a paste with a heaped teaspoonful of fine starch, and then making up to a pint with boiling water. Allow to cool and apply on six or eight layers of butter muslin. Anoint with cold cream before applying the poultice.

For reducing the inflammation the parts may be sopped every hour with a saturated solution of boracic acid, and then treated as for the vesicular stage. In the terminal stage, characterised by redness, thickening of the skin and scaling, this ointment may be used: Liquor carbonis detergens, ½ dram; white precipitate ointment, 1 dram; lanoline and vaseline, equal parts,

to 1 oz. This will also be found useful in most cases of sub-acute and chronic eczema.

EDAM CHEESE. Of the two varieties of Dutch cheese, Edam is round in shape and Gouda is flat. The Edam cheese is made of milk deprived largely of its cream, so that although highly nutritious, it cooks badly, the reason being that it is deficient in fat. *See* Cheese.

EDELWEISS. This favourite Swiss mountain flower (Leontopodium alpinum) can be grown without difficulty in rock gardens in Great Britain. It needs a sunny place and should be planted in loamy soil with which stones have been mixed. The plant grows about six inches high and has grey leaves; the small yellow flowers are surrounded by greyish-white woolly bracts, which are more curious than beautiful. It is propagated by seeds sown in pots of soil in a frame in spring: growth is slow for the first year.



Edelweiss, a popular Swiss mountain flower which can be grown in British rock gardens.

EDGING: In the Garden. There are two kinds of garden edging, known respectively as "live" and "dead." The former consists of plants, the latter of various materials, e.g. wood, tiles, bricks, concrete, or rockery stone. A rockery edging is very attractive: if the spaces between the stones are filled with sandy loamy soil many pretty low-growing rock plants will thrive there. Strips of wood fastened at intervals to short stakes driven into the ground provide a cheap and convenient edging to flower beds and borders, but tiles or a narrow edging of concrete are more lasting. Bricks set in various ways are often used, and if hard bricks are chosen they last indefinitely. Soft bricks are soon damaged by frost. A concrete or cement edging is made by setting up a narrow trough of boards and filling this with home-made concrete or cement. When it has set the boards are removed.

Live edgings, that is those composed of plants, are more attractive and generally to be preferred. There are suitable kinds among both perennials and annuals; the former ought to be used if a permanent edging is required. Edging plants in a border which runs alongside a lawn are apt to spread on the grass and ruin it: this can be prevented by having a narrow paved path alongside the border. Not only does this prevent the grass being damaged, but it provides a dry footing when the lawn is sodden, and the plants look very charming when trailing over it. The best perennial edging plants are thrift (armeria), mossy saxifrage, pink, London pride (Saxifraga umbrosa), Campanula muralis, stonecrop, Veronica rupestris, aubrietia, yellow alyssum, arabis and viola. Pink, aubrietia, alyssum, arabis, mossy saxifrage, London pride and viola should be cut well back after flowering to keep them compact.

Some of the low-growing annuals make charming edging plants: seeds are sown out of doors in March-April to produce plants that will bloom from June onwards; they perish after the flowers are over. Some of the best are Virginian stock, dwarf white alyssum (best of all), leptosiphon, limnanthes, candytuft, nemophila and nemesia. The last named is sown under glass early in March. Golden feather (Pyrethrum aureum) and half hardy plants such as mesembryanthemum, echeveria, and lobelia are often used as edgings to formal summer flower beds. The edgings can be kept trim by the use of the tool called the edging iron. *See* Border; Flower Garden; Path, etc.

EEL: How to Cook. Eels are at their best during the autumn and winter months, and are usually stewed. After being skinned and cleaned, the fish is cut into small pieces, 2-3 in. in length. These are placed in a jar with a sliced onion, a tablespoonful of chopped parsley, 1 oz. of margerine, pepper, salt, and a squeeze of lemon juice. A clove or a teaspoonful of anchovy sauce may be added. The jar is then covered and placed in a saucepan of cold water, being allowed to simmer until the eel is tender, which takes about two hours.

To serve eels fried they should be cut into short pieces, dipped in seasoned flour, and coated with egg and breadcrumbs or batter, and fried until crisp and brown. They should be well drained before the dish is served, and garnished with fried parsley. The smaller fish are best cooked in boiling salted water to which a little vinegar has been added, and served with butter and parsley.

Baked eels can be prepared by cutting the skinned and cleaned fish into short lengths, and standing these in an upright position in a shallow baking-tin. Pour in a little water, add salt and pepper to taste, a little minced parsley, chopped shallots, and some sweet herbs, and bake the whole in the oven. When the fish is ready, take it out of the tin, and thicken the gravy with a small lump of butter rolled in flour. A little white wine may be used for flavouring.

Collared eel is prepared by cutting off the head and tail of a fairly large fish and then skinning it and slitting it down the centre, removing the backbone. Lay the eel flat on a table and spread over it a seasoning made from two finely chopped sage leaves, 2 cloves and 2 blades of mace, a small bunch of herbs (chopped), and pinches of allspice, salt and pepper to taste.

Roll up the fish and tie it securely with a piece of tape. Put the head, tail, and backbone into a pan of well-seasoned water. Boil down these trimmings, then add the fish to the stock, and stew it for 35-40 min., or until it is tender.

To pickle eels, skin the fish, slit them down the centre, and, after removing the bones, rub the flesh over with salt. Lay the eels aside for 3 days, turning them daily; then wash and dry them thoroughly. Season them with a little nutmeg, cloves, mace, and bay leaf, then roll up and tie them in a cloth. Boil them until tender in equal quantities of white wine and vinegar, take them out of the pan to cool, and put them, with the liquor, into clean jars.

Eel Broth. A nourishing broth for invalids is made by simmering ¾ lb. of small eels in a pan containing 2 quarts of water, a few sprigs of parsley, 2 or 3 thin slices of onion, and a few peppercorns. Continue simmering until the fish is broken, then season the broth sparingly and strain it off.

Eel Pie. To make eel pie the eels should be washed, skinned, cut into short pieces, and placed in a pie-dish on a foundation of forcemeat. Lemon juice, chopped parsley, and seasoning should be sprinkled over them, and the pie covered with a crust of short or puff paste. The pie should be baked from ¾ to 1 hour in a moderate oven, and a white sauce can be served with it.

Eel Spitchcock. This dish is prepared by cleaning an eel, rubbing it over with salt, and then slitting it up the middle and removing the bone. After washing and drying it, cut it into pieces 2 or 3 in. long, dredge these with flour to dry them and then shake it off. Make a thick egg batter, to which a little seasoning, minced parsley, sage and shallot, have been added. Dip the pieces of fish in this, and then roll them in fine breadcrumbs. Repeat the process, and then broil them over a clear fire until they are pale brown in colour. *See* Batter; Conger Eel; Pastry.

EELWORM. This is a minute garden pest which attacks cucumbers, tomatoes, daffodils and other plants.

The first symptom of attack is a drooping and yellowing of the foliage, followed by the stem becoming limp, and the collapse of the entire plant. The finer branches of the root are more or less studded with swollen portions or knots, varying in size up to ¼ in. across; knots of larger size are also often present on the thicker branches of the root. To destroy these eelworms the soil must be thoroughly saturated three times, at intervals of a fortnight, with a solution of one part cresylic, or liquid carbolic acid, in 40 parts of water. The plants that are ruined by the eelworms should be burnt.

EGGS AND EGG DISHES

The Best Ways of Preparing a Staple Article of Food

See also the entries Batter; Curry; Custard; Omelette; Savoury; Souffle, etc. The articles Diet and Food may be consulted, as may those on Chicken; Duck; Poultry.

Like milk, an egg is a perfect food, as it contains all the requisites of a diet—proteids, fat, carbohydrate, salts, and water. The yolk is rich in fat and in lecithin, a substance which is important in the nutrition of the nervous system and in growth. A duck's egg contains more fat than that of a hen. The digestibility of an egg is impaired by keeping, hence the value of fresh eggs. Digestibility is also affected by cooking; raw, lightly boiled, or poached eggs being much more easily digested than hard-boiled. Hens' eggs are those most commonly eaten; ducks' eggs are larger, and stronger in flavour. Turkeys' eggs are considered to be delicately flavoured, and the small, spotted egg of the plover is regarded as a delicacy.

Beaten Eggs. The binding properties of a beaten egg are utilized in the mixing of dry ingredients, such as dried fruits, sugar, and flour, for puddings and cakes; minced meats and fish, for the making of rissoles, cutlets, etc. Savoury mixtures are most successfully fried if dipped in beaten egg, as the egg cooks round the outside and makes a coating that prevents the frying fat from reaching the food. Eggs, boiled or poached, are much used as an addition to simple dishes; the boiled whites and yolks, chopped finely, are a favourite garnish for cold service meat dishes. Hard-boiled eggs are a feature of most salads.

Eggs are beaten into batter to give lightness and substance to the coating mixture. When boiled or steamed puddings are mixed with them, the ingredients adhere more closely together; the mixture is lighter, colouring and flavouring richer, and the whole more nourishing. Eggs bind the ingredients of a cake, and help to make it lighter, especially when the yolks and whites are beaten separately.

The yolks add colour and richness to savoury dishes, and make soups for invalids more strengthening. Pastry is given a deep brown gloss if it is brushed over before baking with a little egg. Yolks of eggs are the foundation of mayonnaise sauce, and also of almond paste for cakes.

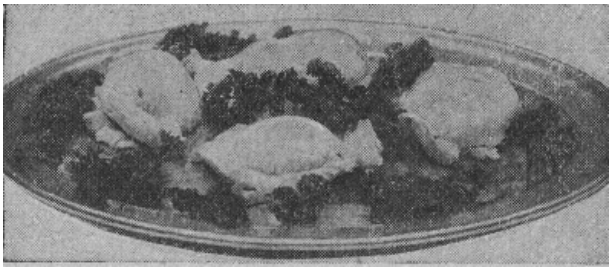
Whisked white of egg with the broken shell is used for clarifying clear soups. Added to jellies when they are almost set, and whisked into them, it makes the jellies light and foamy. A jelly will turn out whole if the mould has been smeared with white of egg, and circles of kitchen paper brushed over with white of egg make excellent jampot covers.

White of egg is particularly useful in cooking for invalids, as it is rich in albumen, and more easily digested than the yolk. The beaten whites of two eggs added to a tumbler of boiled water that has been left until tepid, with a pinch of salt added, make a nourishing drink for an invalid who can retain no other food.

Boiling and Poaching Eggs. To boil an egg, it should be lightly placed in a pan and covered with boiling water, then drawn to the side of the fire where it will simmer, but not boil. In ten minutes the egg will be cooked with a firm white and soft yolk. To boil an

egg hard 15 min. boiling over the fire or gas ring should be allowed, and if required for use cold, the egg should immediately be plunged into cold water to prevent the yolk becoming discoloured, and to make the shell leave the white. When boiling cracked eggs, wrap them lightly in tissue paper.

To poach an egg, if a poaching vessel is not available, a shallow pan should be half filled with boiling water, to which a pinch of salt and a teaspoonful of vinegar are added. The egg should be broken into a cup, gently slipped into the pan, and drawn to the side of the fire. As soon as the white has set, the egg is cooked. Poached eggs are served on toast, and garnished with parsley, or are served over a dish of mince. To fry an egg, use the frying-pan containing the fat from fried bacon, or heat a small piece of fat. Break the egg into a cup and slip into the boiling fat. The pan should be placed over gentle heat, and the egg is ready as soon as the white has set. If preferred the egg can be turned with a thin egg slice and fried on the other side before serving.



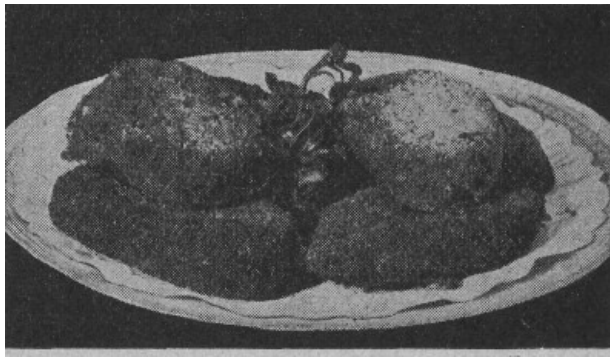
Egg. Poached eggs on toast, an appetising breakfast dish.

An egg poacher is an appliance which comprises essentially an outer pan or water vessel with an inner plate whereon are located the egg divisions. These may be any convenient number, but four is a useful size for the average household.

Scrambled Eggs. Scrambled eggs served on rounds of toast make a good breakfast dish. Prepare them by breaking 2 eggs into a basin, whisk them and mix in 2 tablespoonfuls milk, and a little salt and pepper. Melt 2 oz. butter in a saucepan and, when hot, pour in mixture. Stir with a fork over a gentle heat until the mixture sets, and then turn it on to pieces of toast.

What are sometimes known as Scotch eggs are made by shelling 2 hard-boiled eggs and rolling them in a little flour to dry. Skin 2 raw sausages, season the meat and wrap it round the eggs. Coat the latter with beaten egg, and then roll them in breadcrumbs. Put them into a deep frying-pan containing smoking hot fat and fry them slowly, to make certain that the sausage-meat is thoroughly cooked. When fried, cut each egg in half, place each half on a hot croûton, and garnish it with fried parsley. Tomato sauce makes a good accompaniment to this dish.

Egg-and-tomato cutlets is a dish that does not take much time to cook. Melt 1 oz. of fat in a small saucepan, and in it fry 2 tomatoes. When cooked remove them and rub them through a sieve. Add to the fat 2 hard-boiled eggs, chopped into small pieces. Put the tomato pulp back into the pan and add 1 teaspoonful of chopped parsley and seasoning, and 1 gill of thick brown sauce. Then beat up the yolk of an egg, pour it into the pan, and stir the whole over a gentle heat until the mixture binds. Turn it on to a plate to cool, shape the mixture into cutlets, brush them over with the slightly whipped white of an egg, and coat them with breadcrumbs; then fry them in smoking hot fat. If the mixture is too soft to shape into cutlets, add some breadcrumbs to it. When the cutlets are ready for dishing, drain them and arrange them on a paper doily on a hot dish.



Egg and tomato cutlets, which are easily and quickly prepared in an emergency.

Eggs au Gratin. Eggs treated in this way form the basis of a tasty supper dish. Put 2 oz. of sliced cheese in a casserole or baking-dish, well greased with butter or dripping. Sprinkle with pepper and salt, a little chopped parsley, and a piece of butter or margarine. Pour over it ½ gill white sauce, and break on the top sufficient eggs to cover, or allow one egg to each person. The yolks should not be broken.

Sprinkle the eggs with breadcrumbs and grated cheese and place a few pieces of butter on top. Bake in a hot oven for about 10 min. The remains of any savoury white sauce can be used to pour over the cheese in place of the milk and flour. A few drops of anchovy essence added to a plain white sauce mixture give a piquant flavour.

Egg Jelly. A jelly that is made from eggs is much used in sickroom cookery. To make it, dissolve ½ oz. of gelatine in 1 gill of cold water. Add 4 oz. of castor sugar and the juice and rinds of an orange and a lemon. Stir over gentle heat, on no account allowing the liquid to boil. Remove the lemon and orange rinds and beat separately the white and yolk of one or two eggs.

Add to the yolks a wineglassful of sherry or brandy and stir in the gelatine liquid. Stir in lightly the stiffly beaten whites of the eggs and pour the jelly into a wetted mould.

Egg Mayonnaise. This favourite hot-weather dish is one made from 6 hard-boiled eggs, the same number of tomatoes, ½ pint of thick mayonnaise sauce, and a little pepper and salt. Shell the eggs, and cut them into halves lengthways. Then cut the tomatoes into halves, put them on a baking-tin, and bake them in the oven until they are just tender, but not broken.

Let these get cold, and then arrange them in two straight lines down a pretty dish, dusting a little salt and pepper over each Lay the halves of eggs on the top, with the cut side downwards. Flavour the mayonnaise sauce with tarragon vinegar, and then pour it gently over the eggs until they are smoothly coated. Garnish this dish with pickled chillies cut into small diamond shapes. *(See* Mayonnaise.)

Eggs sur le plat are prepared by melting a small piece of butter in a fireproof dish and then breaking 2 eggs into it. Season to taste with salt, pepper, and chopped parsley, and then pour over them 2 tablespoonfuls of cream and put one or two little lumps of butter on the top. Bake the eggs in a slow oven until they set, and then serve them in the same dish.

Poached eggs, served on squares of toast with a little green sauce poured over them make an appetising dish. Poach 6 eggs as already described, and prepare the sauce by washing 2 oz. of leaves of tarragon, chervil, parsley, chives, and watercress mixed. Pound these together in a mortar, mixing with them a few drops of anchovy essence, and pass the mixture through a wire sieve. Add to it ½ pint of white sauce, and stir the whole in a pan over the fire until all the ingredients are well blended.

Poached eggs may also be served on spinach. Rub ¾ lb. of cooked spinach through a wire sieve, or chop it finely, melt 1 oz. of butter in a saucepan, and put in the spinach with a little seasoning. When quite heated through place the spinach on a hot dish, and arrange 2 or 3 poached eggs on top.

A tasty and economical dish is given the name of vegetarian egg. To prepare it boil 4 eggs hard, put them into cold water, then remove the shells. Boil 4 oz. of lentils until tender. Melt in a saucepan 1 oz. of butter or margarine, stir in 1 oz. of flour and a tablespoonful of milk, or water in which the lentils were boiled, and cook until the mixture leaves the sides of the pan. Add the lentils, a teaspoonful of mixed herbs, and pepper and salt. Mix all together and turn on to a floured plate. When the mixture has cooled and become stiff, divide it into small pieces and cover the eggs with it. Dip them into beaten egg, then roll them in breadcrumbs. Fry in hot fat, cut each in half, and serve hot, garnished with fried parsley.

Egg Drinks. Egg flip is a drink prepared from beaten eggs, sugar, and brandy, though the last-named ingredient is sometimes replaced by sherry or port.

Egg nog is prepared by beating up an egg, straining it into a tumbler, and adding to it 2 teaspoonfuls of brandy and half that quantity of castor sugar. Fill up the glass with ½ pint of scalded milk.

Substitutes for Eggs. The various substitutes on the market include egg powders, custard powders and dried eggs, but it must be remembered that although these may give to any dish an identical appearance, they cannot supply the food values of the real article.

In a simple cake mixture eggs can be omitted and a level teaspoonful of baking powder used to each cupful of flour. A dessertspoonful of vinegar in which half a teaspoonful of bicarbonate of soda has been dissolved can be used in place of 2 eggs in a cake containing fruit or ginger. The vinegar should be the last ingredient to be added. Milk must be used to bind the dry ingredients. When using eggs for cakes or puddings, one egg can serve for two if yolks and whites are beaten up separately. Instead of an egg with a milk pudding, a teaspoonful of grated suet can be used. In making custard, instead of 2 eggs to a pint of milk, one egg and a tablespoonful of cornflour can be substituted. The cornflour should be blended with a little cold milk and added to the milk just before it boils, and brought to the boil in the pan. Stir in the egg after the milk has been removed from the stove.

Testing Eggs. There are various ways of testing the freshness of eggs. The shell of a fresh egg is dull and frequently has almost a bloom, while that of a stale egg is glassy and smooth. An egg with a stained shell has probably been preserved in lime, and if a musty smell clings to the shell it has probably been preserved in bran. One of the surest tests for the freshness of eggs is to place them in a bowl of water. A fresh egg will sink to the bottom of the vessel and lie in a level position, and a bad egg will float on the surface.

Another test is to hold the egg up to the light, in front of artificial light if possible. A fresh egg has an almost transparent shell; the yolk is discernible and the white unclouded. A black speck inside the egg or a thick and clouded appearance is a sign that the egg is not fresh. A stale egg appears to be more transparent at the end than the middle, whereas a fresh egg gives a reverse effect.

Preserving Eggs. Waterglass is one of the most widely sold preparations for preserving eggs; the process really is preservation in lime. The freshness is so successfully retained that the eggs treated in this fashion can be used for all the purposes of fresh eggs.

To make the lime preservation at home, pour 6 quarts of boiling water on to 3 lb. of lime. Add 1 oz. of cream of tartar and ½ lb. of salt. When the preparation is cold, plunge the eggs in. They will swim in the liquid, and should be kept in the tub or vessel in a cool room, or on the shelf of the larder, and taken out as required. It is important that they should be kept at a low temperature, so that the air and fluids which are in the shell do not decompose. Clarified butter and gum arabic can be used as outside preservatives. The eggs are dipped several times in clarified butter and hung in nets, small end downwards, in a room that is kept at an even temperature of about 33° F. If gum arabic is used, paint over the eggs with a brush dipped in the gum, and afterwards pack them in dry charcoal.

New laid eggs may be stored in racks, that is, on wooden shelves containing holes for the insertion of the eggs, with the small ends downwards. They can be kept fresh for months provided they are preserved straight from the nest and are perfectly dry and kept at a low temperature in the summer, but secured from freezing

in the winter. It is unsafe to keep them in a refrigerator, as a fungus forms inside the egg.

Eggs can be preserved by pickling in the following manner. They are first boiled for 10 min., then placed in cold water. The shells are taken off, and when the eggs are quite cold they are put in jars and covered with spiced vinegar. The jars should then be covered with airtight covers, and the eggs can be kept until they change colour.

Cups and Spoons. Eggcups are generally made of china or pottery, but are also to be had in aluminium, nickel, or silver, and in wood. China eggcups should match the breakfast service in colour and pattern. Some are provided with saucers to match, or four or six eggcups are made to fit into a single stand when they are brought to the table. For the nursery, sets are made with appropriate designs. Individual eggcups are also made to order, with each child's name painted on his own cup.

The eggspoon is a variant of the ordinary small spoon, and is used for eating a boiled egg. It is somewhat smaller than the typical teaspoon and somewhat shallower in the bowl. Four or six of these are often made to go with an eggstand, and sometimes the bowls are lined with gilt. *(See* Spoon.)

Uses for Eggshells. Eggshells are used both for cooking and cleaning purposes, and constitute a valuable ingredient in food for poultry. For whitening enamel-lined pans, the shells should be finely crushed and, in the case of stains, mixed with ordinary salt. Crushed eggshells are effective for removing discoloration from glass water-bottles and decanters. The shells should be put into the bottle with warm water and a little shredded soap, allowed to stand, and shaken occasionally. Eggshells are pounded and mixed with other foods for chickens, or with hard-boiled eggs in the case of small chicks. In cookery eggshells are sometimes used in order to clarify clear soups and broths.

EGG - AND - TONGUE ORNAMENT.

This is a form of carved ornament used on furniture and for panel mouldings. It is also a favourite style of moulding for picture frames and is frequently found on chimney pieces in Georgian style. It is also known as egg-and -dart ornament, as the character of the decoration is made by egg-shaped forms alternating with tongues or arrows. It was used by both Adam and Chippendale.

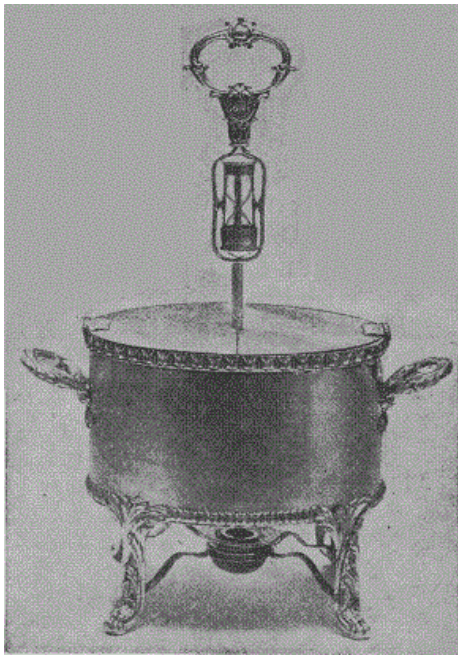


Egg-and-Tongue Ornament, used in furniture and mural decoration.

EGG BOILER.

An article that served this purpose existed in the 18th century. It is usually an ovoid or flat vessel in two parts, with a ring for 3 or more eggs. The body is supported in a frame with legs, and under it is a small spirit lamp. An antique egg boiler in silver is illustrated below. It is made to hold 8 eggs, and on the handle is a sand glass. The lid is divided and opens outwards on hinges at either side to disclose the egg ring which is attached to the handle and is removable from the vessel.

The egg warmer was made to serve a slightly different purpose, i.e. to keep the eggs warm, not to boil them. It had no lamp, but was provided with a liner or hot water jacket and a light tray by which the eggs could be let down or raised from the bowl.



Egg Boiler. Antique specimen with hinged lid. It has a spirit lamp beneath and sand-glass above. (Courtesy of Chapple & Mantell, Ltd.)

EGG COSY.

Egg cosies are designed to keep boiled eggs hot when they are put in their eggcups. They are usually included in breakfast tray sets, with tray cloth, napkins and tea cosy to match. Tiny detachable linen or lawn covers are worked in coloured cross-stitch to match the china used. The padded cosy is made like a miniature tea cosy. Egg cosies can also be made from white blanket cloth stitched in colour. Two semicircular pieces are needed. When sewn together they should be large enough to cover the egg and egg cup. *See* Cross-stitch; Tea Cosy.

Egg Plant. This is an alternative name for the aubergine, a plant of the natural order Solanaceae. *See* Aubergine.

EGG SHAMPOO.

The beaten yolk of an egg either used alone or mixed with hot water makes a good shampoo for a greasy scalp.

The yolk of an egg is beaten up in a gill of tepid water. This is rubbed thoroughly into the scalp and

hair, and then the head is douched repeatedly with warm water till the hair is clean. The shampoo is effective, and does not have the hardening effect on the hair of soap, ammonia, or spirit. If liked, a few drops of oil of lavender may be added. *See* Hair; Shampoo.

EGG STAND. Stands made to hold a number of eggcups for use on the table can Ibe had in a variety of materials and styles. Some are of china and others of earthenware or metal. The eggcups are placed in holes in an article which is shaped not unlike a basket, from which they can be removed when required. Silver or electro-plated stands usually have pegs on to which the cups fit, and a device for holding spoons. A handle, often in the shape of a ring, is provided for lifting the stand. The screws or other fastenings of these articles need inspecting occasionally.

Egg frames, as they are called, existed in the 18th century, when they were made in silver and Sheffield plate. They are sometimes found in combination with a toast-rack or salt-cellar. One fine example stands on ball feet and is decorated with shells and the gadroon. It is fitted with cut-glass eggcups.

EGG WHISK. Various kinds of patent egg whisks can be obtained from the ironmongery stores. One of the most satisfactory types is manipulated by means of a small wheel with a handle attached. This wheel, when set in motion, causes the wires to rotate rapidly so that the egg is whisked to the required stiffness in the minimum amount of time.

Eglantine. This is a name sometimes given to the fragrant sweet briar (q.v.).

EGYPTIAN STYLE: In Furnishing. Sometimes if it is wished to give a special character to a sitting room, or to make an appropriate setting for ornamental Egyptian possessions, this style is suggested in the decoration and in the furnishing fabrics. The latter may be woven or printed in the conventional stripes or in the figure and animal designs of ancient Egypt, while views of pyramids, the Sphinx, and fallen pillars half buried in desert sand appear on lampshades and are embroidered on cushions, or are painted on screens or wall panels.

Browns, from sand colour to the darkest shade are used with Nile green and scarab blue to show the Egyptian inspiration, which also appears in trimmings and beaded tassels, arabesque designs on rugs or carpets and carved wooden screens. Such a furnishing scheme must be kept as simple as possible or the owner of the room will quickly tire of it.

EIDERDOWN. Owing to its extreme lightness and the large quantity of air and down it encloses, an eiderdown gives extra warmth with only a negligible increase in weight, air and down being non-conductors of heat. Ventilation is provided by small circular holes, which are strongly buttonholed to prevent fraying and any escape of down.

Down quilts, as well as providing extra warmth, are decorative when covered in silks and sateens of beautiful colour and design, The most important matter is to get a perfectly down-proof material that is light in weight and soft to the touch. Down-proof printed sateen, cotton-back satin, fancy shantung, Jap silk, and artificial silk taffeta are the materials chiefly employed. The last two possess the disadvantage of easily slipping off the bed unless sateen is used for the under side. *See* Down; Quilt.

ELASTIC. The elastic used for garters, suspenders, braces, belts, corsets, surgical stockings and many other purposes owes its stretching quality to rubber. The more strips of rubber there are in a given width the better the elastic.

If overheated the rubber loses its virtue. Moist heat is less detrimental to it than dry, so that an elastic article that may stand washing will suffer from artificial drying; rubber is ruined by hot ironing or by overstraining. Oil is detrimental. After a certain time any rubber perishes and must be renewed.

Elastic Stocking. A stocking made of a woven elastic fabric is used to exercise equable pressure on the leg from the foot upwards, and so assist in the return of the blood from these parts when the veins are dilated and varicose. It should always be properly fitted. A woven elastic bandage has the advantage that it can be freshly applied each morning and the pressure properly adjusted. *See* Varicose Veins.

ELBOW. The region at the elbow or bend of the arm possesses two joints, the elbow joint and the joint between the upper ends of the radius and ulna, the bones of the forearm. The elbow joint is of the hinge variety.

Dislocation may take place at these joints, a common one being a backward displacement of the upper end of the ulna, stiffening the joint and forming a prominence on the back of the elbow. The treatment of dislocations is to support the arm in a sling and apply cold to the joint while awaiting the doctor. Fracture of the lower end of the humerus near the joint is liable to be followed by stiffness for a long time.

Sprains of the elbow are treated by the application of cold water and supporting the limb with a greater arm sling. Tennis elbow is a painful affection of the arm; it does not interfere with the coarse movements of the limb, e.g. lifting weights, but it renders very difficult movements calling for a finer adjustment of the muscles, e.g. handling a teacup. It has been suggested that it is caused by using a racquet with too big a handle for a comfortable grasp. *See* Bandage; Dislocation; First Aid; Fracture.

ELDER. The common elder (Sambucus nigra) is a hardy shrub distinguished by its soft stems, lobed leaves, the odour of its white flowers and its clusters of black fruits. It will flourish in shady places and is

useful as a shelter shrub in seaside and other windy gardens. There are several varieties with coloured leaves, e.g. aureo-marginata; the variety laciniata has deeply cut ornamental leaves. The golden leaved variety of the red-berried elder (Sambucus racemosa aurea) is a handsome shrub of considerable garden value. The branches should be hard pruned each spring, for the leaves are most highly coloured on the fresh shoots. Propagation is by cuttings set out of doors in autumn.

ELDERBERRY WINE. For elderberry wine, take 5 gallons of water, boil for half an hour, and then stand till just cool to the hand. Add this water to a tub in which have been placed 20 lb. of Malaga raisins, chopped with a knife or shredded and the stalks removed. A wooden tub is best for this purpose, but a glazed stoneware vessel will serve.

Stand the tub for 10 days in a moderately warm room, stirring at least three times a day in order to keep the raisins submerged. At the end of this time press the juice out of 10 lb. of fully ripe elderberries, and to this juice, which should be about 5 pints in amount, add 2 ½ lb. of sugar, boil for half an hour, cool, and add to the raisin liquor. Stir the mixture thoroughly, and strain it off into a 4 ½ gallon cask.

Slight fermentation may go on for some days, and the cask should be bunged lightly to let the gas escape; better still, bore a hole in the bung and fill it loosely with cotton wool. Keep the cask full, and do not allow it to get chilled. The wine should be ready to bottle in a couple of months. If the raisin liquor should show no sign of fermentation after 5 or 6 days, 2 or 3 oz. of brewer's yeast may be added; but this should be unnecessary if it has not been allowed to get too cold.

ELDER FLOWER WATER. To make this water, take 8 oz. of elder flower blossom and 1 pint of raw alcohol. The flower blossoms are steeped in the alcohol for 10 days, and the liquid is strained through filter or blotting-paper. A few drops of simple tincture of benzoin is then added. The mixture is placed in small bottles with airtight stoppers. Elder flower water is soothing and whitening when applied to the skin. It can be added to the washing water.

ELECAMPANE: In Medicine. The drug is obtained from the root of Inula helenium, a bog plant, and is used for many medicinal purposes. It is found useful in dropsy; it acts as a tonic and stimulant, and it may also be used as an expectorant and as an emmenagogue. Externally it has been found helpful in scaly skin diseases. The dose is 20 grains to 1 dram.

ELECTOR. An elector is one, whether man or woman, who is entitled to vote at elections for members of Parliament and for town councils, county councils and other local authorities. To become an elector one's name must be placed upon the electoral roll, which is drawn up every year. The ordinary qualifications are residence or the occupation of business premises for three months, and the attainment of 21 years. Those who are in doubt about their position should apply to the town clerk if they live in a borough, or, if not, to the clerk of the county council. *See* Vote.

ELECTRICITY: In Medicine. Treatment by electricity may be employed in various kinds of disease. The best-known forms used are those of galvanism and faradism. The former is constant current electricity; the latter is an induced current of an alternating nature. A high frequency current is one which reverses the direction of its flow so rapidly that there may be as many as two million alternations per second. Diathermy, which is a heat-producing agent, is carried out by an intense current of this description.

The galvanic current is used in ionisation for treating neurasthenia and other constitutional diseases; to stimulate paralysed muscles; for nerve and muscle testing; in electrolysis for the removal of birthmarks and superfluous hairs. The faradic current is of value in the regeneration of wasted muscles; in obesity, this form of electricity being used in the Bergonié method; and in certain gynaecological conditions.

High frequency is especially valuable in conditions of pain and congestion, and in treating skin lesions such as boils and ulcers. Diathermy is used to destroy piles and various kinds of tumours; to increase metabolism: to relieve neuritis; in pneumonia, and for other purposes. Diathermy is much superior to poultices and similar hot applications, because the heat is produced in the tissues themselves.

The application of electricity to the diagnosis and treatment of disease can only be carried out properly by a doctor or under his immediate supervision; much of the work is done by specialists.

Indirectly, electricity is used in medicine to operate the electro-magnet, used for removing metallic foreign bodies from the eye; burrs, used in operations on bone and on the teeth; and vibratory machines for massage. Instruments on the principle of the telephone are used as aids to the deaf. Electric lamps are used for radiant heat baths, and electric currents, with suitable apparatus, are necessary for the production of artificial sunlight and of X-rays. *See* Electrolysis.

ELECTRICITY IN THE MODERN HOME

Devices which Lighten Labour and Increase Comfort

This article describes the wiring and fittings desirable for an up-to-date house, and explains how to make the best use of electrical equipment. See also Bells; Cooker; Fire; Fuse; Kitchen, etc.

In a house that is connected to a public electric supply main the possible applications of electricity for lighting, heating, cooking and the driving of small machines are almost endless. If the wiring of a house is carried out in accordance with the recognized rules (and it is the business of the supply undertaking to see that this has been done before the installation is connected to its system), the chance of any accident is

negligible. A wire cannot cause a fire unless its temperature has been raised to a red heat or more; but while heat is developed in any conductor through which a current of electricity passes, wires such as are used in the electrical installations of houses do not become appreciably heated unless the current passed through them is a great deal larger than that which they are intended to carry.

Safeguards Against Fire. The circuits are always provided with fuses, which are in effect weak places that, in the event of the current becoming excessive through some accident, give way at points so arranged that no harm can be done. These fuses consist of short lengths of metal which melt at comparatively low temperatures, so that if the current in the circuit becomes too great, they are heated and melt before the rest of the circuit becomes unduly hot. In so doing they break the circuit and cut off the current, which cannot be restored until a new fuse is put in.

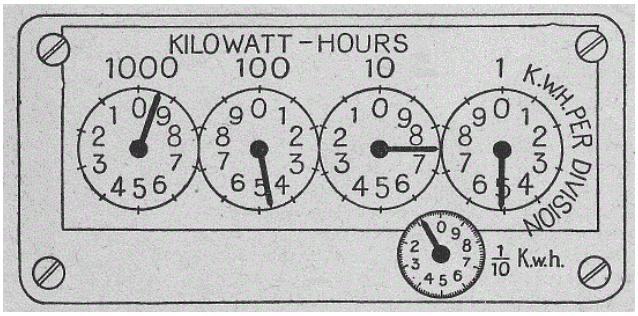
A small supply of proper fuse wire should always be on hand for emergencies. This can be purchased from most electricians, and should be of the same thickness as before. For any ordinary house lighting circuit it should not be larger than that known as 5-amp. wire. The use of too large fuse wire may be an infringement of the wiring rules approved by the fire insurance company. Full directions for replacing a burnt out fuse are given in the article Fuse. If after replacement the new fuse should melt also, then some definite reason should be looked for and the fault removed. This is a job for a practical electrician. It may be that the lights and small appliances on the circuit take a total of more than 5 amperes, when, in emergency, the fuse might be strengthened to two strands of wire—*not more.* The main double pole switch should be open while any such repair is in progress, so that no current can pass.

Mains and Meter. In the case of a public supply, the main wire, or service cable as it is properly called, will be brought into the house, and terminate in the basement or other convenient location on the ground floor. The company will also fix two safety devices known as fuse-boxes, and, when the installation is complete, will test the whole system. If all is correct, they will fit the fuse wires and close and seal the fuse-boxes. Both the meter and the fuses remain the property of the company and must not be interfered with.

From these fuse-boxes the current is taken to a meter, to indicate the amount of current consumed, and from this point to a double pole switch, so that the current can be entirely disconnected from the house at will. The current is taken to various fittings known as distribution boards, and thence by thinner cables to the various lamp points and other fittings. This system is known as the wiring system, and it is the part of the work carried out by the electrician or contractor employed by the house owner.

The source of supply settles the nature of the electric current (i.e. direct current or alternating), and the voltage of the system. The voltage for lamps and fittings must correspond with that of the system. Thus a lamp that is made for a 220-volt circuit can only be used on that voltage; if the voltage is less, the lamp will only glow dull red, and if a higher voltage is used the filament will burn out and the lamp be destroyed. The quantity of current depends on the number and type of lamps used in the house, and this determines the size of the wires and the nature of the safety devices or fuses.

Measurement of Electricity. The pressure of the electricity is called voltage, measured in volts; the quantity is the current, measured in amperes (amps.); and the power is measured in watts, this being ascertained by multiplying the volts and the amps. Thus a pressure of 200 volts and a quantity of 5 amps, is known as 1,000 watts. 1,000 watts equal 1 kilowatt (kw.). The basis of payment is the Board of Trade "unit" or kilowatt hour (kw.h.), which is equal to the power taken in kw. multiplied by the time of use. Thus a 1-kw. fire used for one hour or a 2-kw. fire used for half an hour consumes one unit.

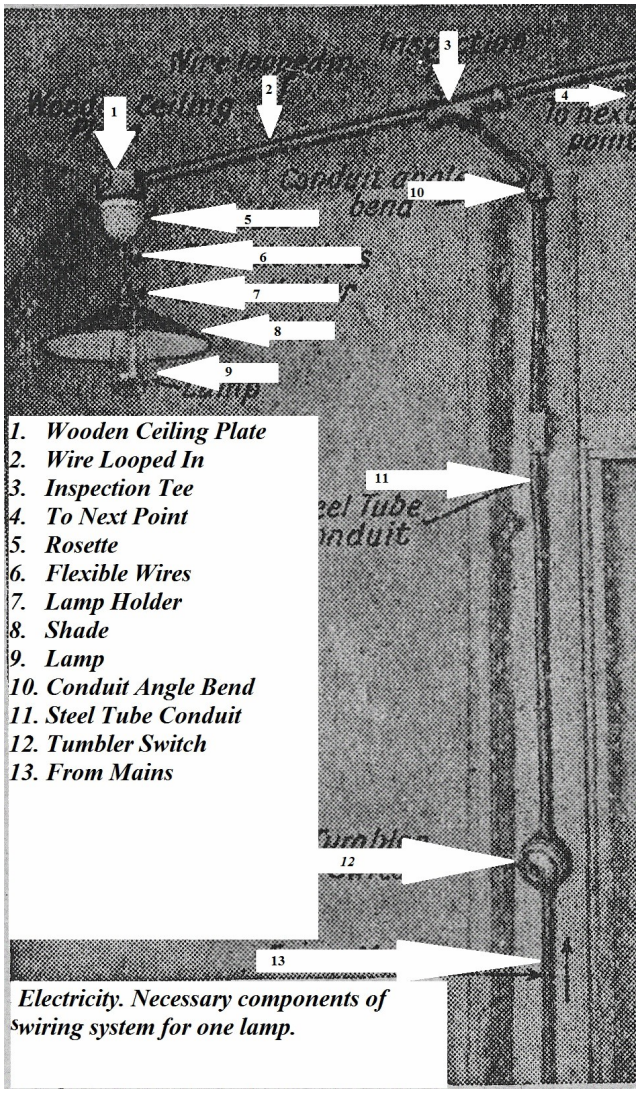


Electricity. The dial of an electricity meter showing positions of the dial hands. The correct reading should be 9475.

In reading the dials of an electricity meter, start with the right-hand side, putting down the figures in order of units, tens, hundreds, thousands. The dial hand should always be read as indicating the figure it has last passed and not the one to which it may be nearest. Thus, if a dial hand is very close to a figure, whether it has passed that figure or not must be determined from the preceding or lower dial. If the dial hand of the lower dial has just completed a revolution, the dial hand of the higher dial has passed the figure, but if the dial hand of the lower dial has not completed a revolution the dial hand of the higher dial has not reached the figure, even though it may appear to have done so. When one dial hand is on 9, especial care must be taken that the dial hand of the next higher dial is not read too high, as it will appear to have reached the next number, but it will not have really done so until the dial hand at 9 has come to 0. The dial hands on adjacent dials revolve in opposite directions; therefore, a reading should always be checked after being written down, as it is easy to mistake the direction of rotation of the hands.

The small size dial, marked 1/10 kw.h., and sometimes coloured red, is usually for convenience in

testing the meters, and in reading the meter consumers need not regard anything below the dial divided into units or kw.h.



Electricity. Necessary components of wiring system for one lamp.

Wiring Specification. The following specification of wiring suitable for medium size rooms is issued by the Electrical Development Association, 2, Savoy Hill, London, W.C.2.

FRONT ENTRANCE.—One lighting point at front entrance; switch in suitable position in hall.

HALL.—One ceiling lighting point. In large or long halls, additional ceiling or wall points as required. Two two-way switches fixed in convenient positions. One large plug and switch in a convenient position for fire and vacuum cleaner.

DINING ROOM.—One ceiling lighting point over centre of table; one switch in room near entrance. Wall points as required. Additional switches to be installed to control wall lights. One small plug fixed near sideboard for toaster, warming plate, percolator, etc. One large plug and switch at side of fireplace.

DRAWING ROOM OR LOUNGE.— One ceiling lighting point in centre of room; switch near entrance. Two small plugs fixed near window or fireplace or in other convenient position. One large plug and switch on skirting at side of fireplace or window.

KITCHEN AND SCULLERY.— One ceiling lighting point. Additional ceiling or wall points may be installed in ceiling or on wall over cooker, or sink. One switch to control ceiling light. One small earthing plug fixed between 3 ft. and 4 ft. from floor in suitable position for use of iron, etc.; two large earthing plugs and switches for fire, water heater or wash boiler. Special wiring with cooker and kettle control board if not provided by supply authority.

LARDER, BACKDOOR, AND OUTHOUSES.—Lights to be installed as required. One switch to be fixed in most convenient position for each light.

GARAGE.—One ceiling lighting point; one outside light over garage door if desired. One switch inside door to control inside light; one waterproof earthed switch to control outside light to be fixed outside. One small earthing plug for convenient connexion of hand-lamp, engine heater, etc.

NOTE.—In the kitchen, scullery, larder, garage and wherever there is a concrete, stone, tiled or composition floor, lampholders are to be made of insulating materia1and switches are to be earthed or made of insulating material.

LANDING.—One ceiling lighting point to be fixed so as to illuminate landing and top of stairs. Two two-way switches to be fixed, one on the landing and the other near the hall light switch on ground floor. One small plug for convenient connexion of vacuum cleaner.

BEDROOMS.—One ceiling lighting point. Wall points for bracket lights to be installed if desired. Two two-way switches to control ceiling light, one fixed at the door and the other near the bed. An additional switch to be installed to control wall bracket points. One small plug to be fixed preferably 3 ft. from the floor near the bed for table lamp, kettle, etc. One large plug and switch to be fixed on skirting in a convenient position for fire.

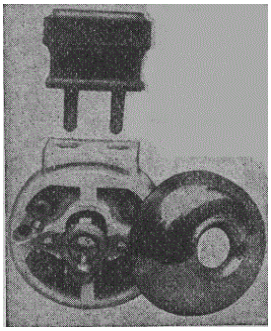
BATHROOM.—One ceiling lighting point preferably over basin; wall bracket over shaving mirror. One switch to control ceiling light. Lampholders to be made of insulating material. Switches to be earthed or made of insulating material. All appliances such as towel rail, water heater and fire, to be permanently fixed and all exposed metal connected with earth. Portable electric appliances, such as a fire, should not be taken into the bathroom.

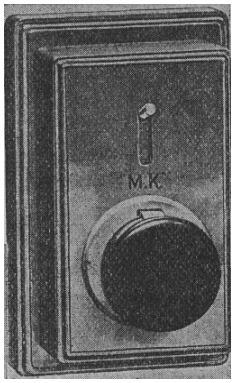
WATER CLOSETS, ATTICS, LOFT, CUPBOARDS.-Ceiling or wall lighting points as required. One switch for each light. It is recommended that lights should be installed in all places such as cupboards under stairs, etc., which are not properly illuminated by general lighting.

The above specification is based on the assumption that electricity will be available under a "Two-part" or "All- in" tariff at the same price for lighting as for heating. If this tariff is adopted the wiring is much simplified. In arranging for an installation it should be specified that the work and materials should

be in accordance with the rules and regulations of the supply company concerned, the fire insurance companies, and the Institution of Electrical Engineers. This is specially important when a house is being erected under a contract.

Wall Plugs and Sockets. One of the great advantages of electricity in the house is its cleanliness, and another is its flexibility With a few yards of flexible wire a portable electric lamp can be placed exactly where it is most comfortable to read by, and similarly small electric appliances, such as irons and toasters, can be used in the position that is most convenient. The flex has attached to one end a bayonet catch adapter which can be inserted in the lampholder of any fixed electric lamp. The bulb, however, must previously have been removed, and this means that the fixed lamp and the portable lamp or appliance cannot be used simultaneously. This difficulty can be got over by using a special form of adapter, one end of which is inserted in the fixed lamp holder, while the other has two branches, one to take a lamp and the other to take the adapter attached to the flex of the appliance.



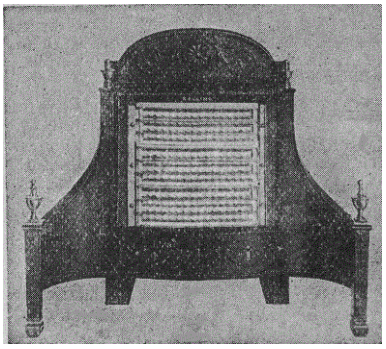


Electricity. Above, switch plug; right, interlocking switch-controlled connecting plug.

A better plan, however, is to have sockets and plugs placed on the walls of the rooms. The adapter at the end of the flex then takes a somewhat different form, consisting of a plug with two prongs or pins which go into two holes in the socket and establish the circuit. Preferably, the wall sockets should each be provided with a switch, so that the current can be switched off when the appliance is finished with and before the plug is withdrawn from the socket. A good type of switch plug incorporates an interlocking device, so that the plug cannot be withdrawn from the socket unless the current is first switched off.

The merits of the various types of electric light fittings are discussed in a subsequent article, and the larger cooking appliances are dealt with under the heading Cooker. Apart from these and the various heating appliances, described later, there are the many accessories for the home which add to comfort or lighten labour.

Most electric appliances, such as a toaster, coffee percolator, table warming plate, or flat iron can be safely connected to the ordinary lighting circuit. This applies also to the vacuum cleaner or the motor for working a sewing machine, but not to the larger appliances. The lighting circuit is not usually designed to carry the heavy currents that are required by large appliances, and if it is asked to do so the result will be blowing of the fuses. If electrical heating, or cooking appliances are to be used on any considerable scale, it is essential to have a separate circuit. This need not involve an extra meter, as most supply undertakings have a system by which a fixed standing charge is made, and all units consumed are charged for at a flat rate, whether used for lighting, heating, or for small mechanical appliances. In the electric fires used for warming rooms, and also in such appliances as toasters and grills, the heating elements are exposed to view. In electric kettles and saucepans the heating elements are concealed in the walls or in a double bottom, and are liable to be burnt out and destroyed if the current is turned on when the vessel does not contain any liquid. Similarly in an electric boiling plate they are arranged inside so as to heat the iron plate, which in turn heats a utensil placed upon it. Electric ovens are made on much the same plan. Immersion heaters are another form of electric heater which can be used for liquids, and are small portable heating elements which are placed in the liquid to be heated. The advantages of electricity as an illuminant are many and well known. For warming rooms it is rapidly coming more into use, and the all-electric house, where the essential services of lighting, heating, cooking, etc., are performed by the aid of electricity, is a feature of some modern housing schemes.



Electric Heating. Fig. 1. Period heater in Adam style, finished in black, copper or bronze. (Courtesy of Belling & Co.)

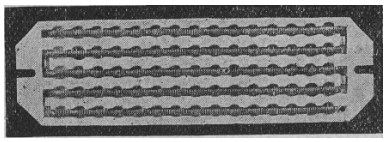


Fig. 2. Standard element or firebar used in the electric heater shown above and in similar apparatus.

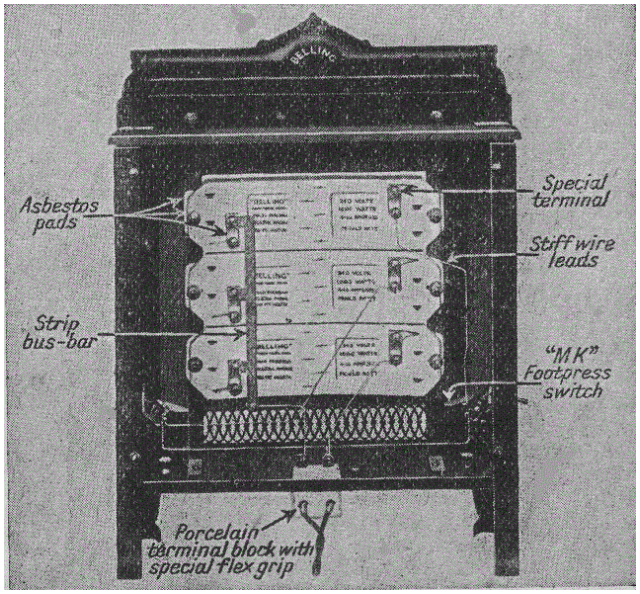
The power that is required for lighting a moderate-sized house can be estimated roughly bv taking the number of bedrooms and reception-rooms, multiplying it by three to get the approximate number of lights in the whole house, and then allowing an average of 30 watts per light. It is assumed that in all cases gas-filled lamps are used and the walls are light in colour and the ceiling white.

Electric Heating. By far the majority of electric heaters used to-day are of the open wire element type. The element which provides the heat consists of some

variety of porcelain, fireclay, asbestos or mica bar, on which open coils of resistance wire are wound. These coils end in terminals which are wired up to the switches of the heater, and when the current is turned on the coils glow to incandescence and thus project heat out into the room.

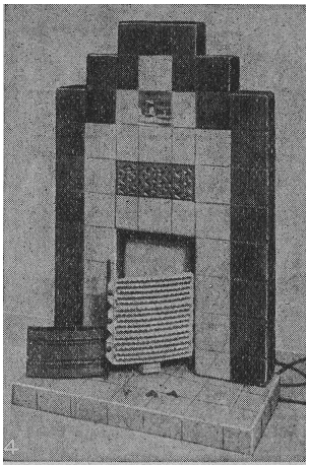
Fig 1 shows a period stove, designed to heat a room 18 ft. by 16 ft. It takes 3, 2 or 1 unit per hour, according to the switching. A smaller size to heat a room about 16 ft. by 14 ft. by 9 ft. high, consumes at the maximum 2 units per hour, but can be reduced by the switch to half power, when it will take 1 unit per hour. It is generally arranged, in fires of this type, to leave one of the elements permanently connected across the main supply. Thus the plug must be removed from the wall socket, or the wall plug switched off, entirely to switch off the fire, preventing any possibility of a live flexible lead being left lying about the floor, where it might be a source of danger.

Fig. 2 shows the standard element or firebar employed in this make of stove. The face of the bar consists of a number of wells of parabolic shape, in which the heat generating wire is seated in correct focus. The heat rays projected on to the bar from the glowing wire at its focus are thrown out in parallel horizontal beams, and thus the maximum amount of radiant heat is projected. Fig. 3 shows a back view of a fire with the cover removed. The switch used on this type is designed to be operated by means of the foot.



Electric Heating. Fig. 3. Back view of electric fire of the type illustrated above, showing the heating elements, wire connexions and foot switch. (Courtesy of Belling & Co.)

With electric fires there is freedom from draughts. An existing coal grate need not be displaced, as a portable electric fire may be stood on the hearth in front of it. Fig. 4 shows a fireplace specially designed for electric heating. The fire is shown in process of fixing. This type may be placed flat against a wall. Fig. 5 illustrates an imitation coal fire, in this case one of the Efesca type. In the "Tri-city" fire, shown at Fig. 6, there is a series of metal reflectors.



Electric Heating. Fig. 4. Bell self-contained fireplace, showing how fire is fixed.

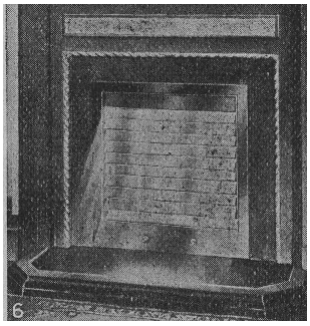
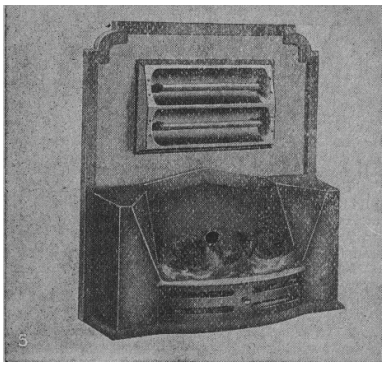
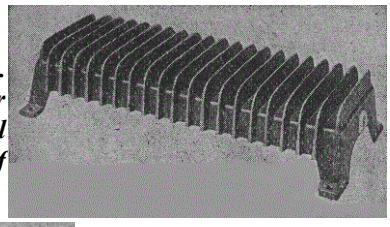


Fig. 6. Tricity sunray radiator.



Left. Fig. 5. Efesca electric fireplace.

A figure that is given to decide upon the size of electric fire required to heat a given room is 1,000 watts, or 1 unit per hour per 1,000 cubic ft of space to be heated. Thus in an ordinary room, say, 10 ft. high by 14 ft. by 14 ft. (i.e. cubic capacity 1,960 cubic ft.), a 2,000 watt (2 kw.) fire, consuming at maximum 2 units per hour would be a suitable size.



Electric Heating. Fig. 7. Horizontal air warmer for a small room.(Courtesy of Belling & Co.)

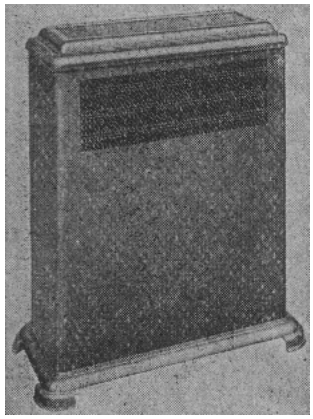


Fig. 8. Electric convection heater controlled by a thermostat. (Courtesy of Belling & Co.)

Other methods of warming by electricity include various forms of convection heaters (popularly termed "radiators") and also systems where the heat is mainly dissipated by actual radiation from the surface of the element, which is non-luminous. An example of the convection heater is the air warmer shown in Fig. 7. It is designed to heat rooms 12 ft. by 10 ft. by 9 ft. high, and con-

sumes 1 unit per hour. The dimensions are 8 in. by 18 in. by 4 in. high. Other convection heaters have a three-heat switch and a thermostat can be fitted if required. In the hall it will prevent draughts and circulate warm air upstairs (Fig. 8). There are also hot water radiators, in which the water is warmed by an electric immersion heater fitted in the lower part of the casing. The convection heaters described are especially useful for warming halls or passages.

A system well worthy of attention is that known as "Unity" tubular electric heating. It works by low temperature radiation, the whole surface of the tube being active. The heating coil is laced on a mica frame and encased in a steel tube 2 in. in diameter. The tube is supported on brackets, the number and length of the units being proportioned to the size of the room to be warmed. There is a rapid rise of temperature when the current is switched on, and full heat is available in a few minutes. The temperature may be automatically controlled by a thermostat. This system is illustrated at Fig. 9.

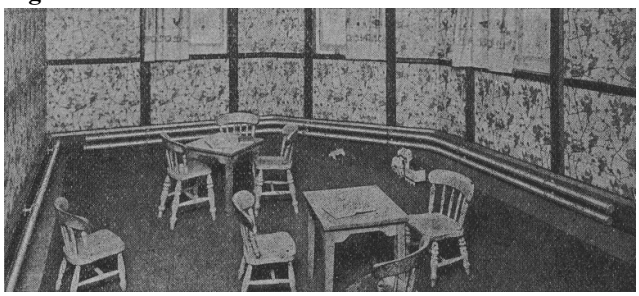


Fig. 9. "Unity" Tubular System installed in a nursery school. Heating tubes are attached by brackets to the skirting boards and the system operates by low temperature radiation.
(Courtesy of Young, Osmond & Young, Ltd.)

In a system known as Dulrae panel warming self-contained electric heating elements are disposed in the ceilings of the room, and the apartment is warmed by direct radiation from the heated ceiling areas. This system can be readily installed when a house is in course of erection, and may also be applied to existing buildings. An automatic device regulates the heat, and this may be set to just the temperature needed to keep the room and its contents well aired (e.g. when the house is left unoccupied).

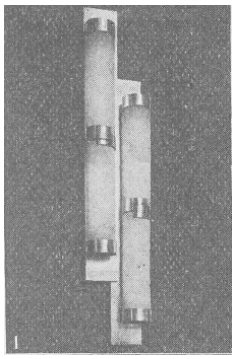
Safety Precautions. Always turn off all switches, where provided, on the device first, then switch off at the wall socket. To disconnect, take hold of the plug; do not pull the flexible cord or get it into a tangle. Frayed, knotted, or otherwise damaged flexible cords, broken connectors, plugs and switches, should not be used until properly repaired or renewed. Appliances, of a loading exceeding 700 watts should not be used from lampholders.

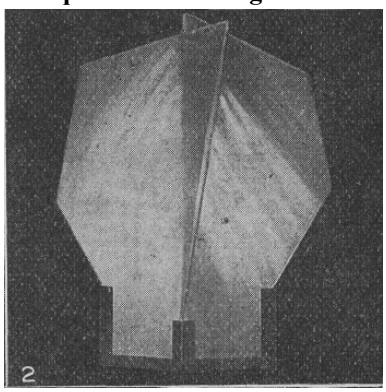
ELECTRIC LIGHT: FITTINGS FOR THE HOME

Suggestions to Suit the Several Styles of Room

The reader is referred to the preceding article on Electricity; and also to Candleshade; Lampshade; Standard Lamp. Bedroom; Hall; Staircase may be further consulted.

The effective possibilities of room lighting have assumed an important place in schemes for interior decoration since electricity has been within the reach of so many people and is likely to become still more accessible. Even where any public supply of current is unavailable it is not a matter of great expense or difficulty for a house in the remotest country district to have electric lighting by means of its own generating plant, as for this sole purpose a much smaller plant is sufficient than would be required for heating.





Electric Light. Fig. 1. Strip lights in tubes. Fig. 2. Shade of translucent glass. Fig. 3. Stalactite corner lighting. Fig. 4. Central fitting in opaque glass.

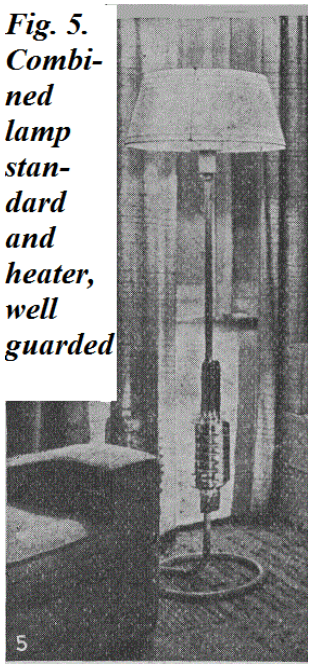
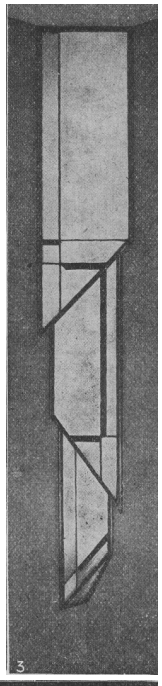
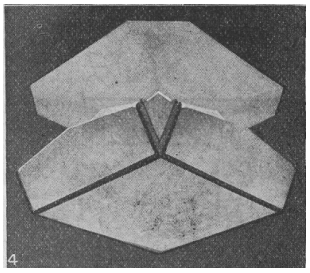


Fig. 5. Combined lamp standard and heater, well guarded





When planning the lighting for a room the practical side will, of course, not be overlooked for the sake of the decorative. The two necessary considerations on the first side are the adequate placing and strength of lights for their requisite purposes in the

particular room and the economy achieved by choice of the correct type of fittings. It is a much better scheme, for instance, to have wall plugs conveniently placed for extra lamps than to depend on one central fitting for all purposes, which must either be too dazzling for the eyes or quite ineffectual for concentrated light on reading or work. It is not economy to strain the eyesight or to produce irritation by a glare when it is unnessary.

Several new forms of gas filled lamps have been introduced which overcome the tendency to a glaring light when used with the type of pendant or wall bracket which discloses the bulb. At the same time these do not in any way interfere with lighting efficiency. The most commonly known are the 'opal' and 'pearl.' The bulb of the former has an inner clear glass and an outer one of thin opalescent glass, while the latter bulb is frosted on the inside.

Modern Ideas on Lighting. The modern lighting expert not only brings out the good features of a room, but also creates fresh beauty by his artistic methods and designs. Wall niches covered with gold or silver leaf or metallic paint and a framing of mirror glass, metal or contrasted moulding, are rendered even more effective by night than by day with a concealed light placed above and below to show off the china or other ornament in the niche. Other niches or small wall cupboards have glass panes in the doors, which are in themselves fine pieces of decoration, being tinted, engraved, semi-transparent with sand-blasted designs, or beautiful with metal work in wrought iron or bronze. The light, white or coloured, shines through these glazed doors with a glowing effect. Other decorative ideas for corner lighting are glass statuettes and flower bowls placed on stands which are lit from inside, the light shining through a top of frosted glass which illuminates the glass object on the stand. Moulded glass panels are also set into walls to give diffused lighting when lit from behind.

Strip lighting is effective for recesses, or cupboards, but is apt to be too expensive for the concealed lighting of a whole room, although it has recently become much cheaper. Strip lights set in tubes of frosted glass are, however, a feature of modern lighting and are very practical either as wall fixtures arranged vertically with metal plates and bands as shown in Fig. 1, or set in a single tube horizontally for illuminating mirrors. An illustration of a fitting of this kind can be found in the article on dressing table attached above the mirror in the design for constructing a pedestal table.

While modern wall and ceiling fixtures tend to severity of style, beautiful effects are obtained by means of good outline and by the faint stripings and diffused lighting which glows from the translucent or opaque glass used by the designers. Such fittings as those illustrated in Figs. 2, 3, 4 are obviously suited to the modern type of room and would look out of place in a room furnished in a period style. Fig. 2 would be a charmingly decorative wall fixture for a drawing room, while Fig. 3 would be equally appropriate for a dining room, hall, staircase, or lounge fitting and would decorate a corner in the practical fashion of to-day when things beautiful are also required to be useful. Other charming wall brackets for sitting rooms have oxidised silver or gilt mountings with either rimpled or tinted glass.

For a sitting room there is still a general liking for a central fitting using two or three 60-watt lamps, especially where a room is of good size. This fitting is usually supplemented by table and floor standard lamps and by wall fixtures where these are necessary. Fig. 4 illustrates a plain ceiling fitting of effective and beautiful outline for dining room or living-room with appropriately severe style of furnishing. Pendants are also made of imitation vellum in squared or oblong tiered designs with coloured tassels of woollen beads and silk on the corners of the lowest tier. These pendants have a somewhat Chinese character, which renders them particularly suitable for a room with pieces of lacquer furniture. A modern lantern form of ceiling fitting for a hall is designed for tubular lamps with an outer framework of oxidised metal alternating with strips lacquered in a brilliant red or green.

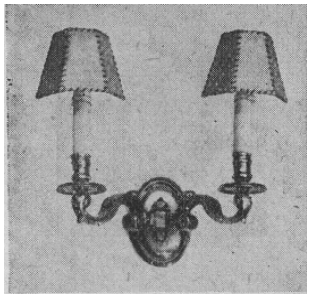
Colour in Lighting. Colour is of importance in lighting as it is often possible to improve the aspect of a room by this means. Warm tints should be chosen, whether for the colour of lamps behind translucent glass or for shades. Bleak lighting, white or bluish, for general effects should be avoided, though for local lights or for reading and working lamps, it may be essential. The suitable colours for shades are pink, and tones from cream to orange, because these are related to the actual colour of the light itself. They are not only becoming, but also impart a cosy look to the sitting room, an inviting one to the entrance hall, and an appetising one to the food in the dining room—all important points in the well-run home.

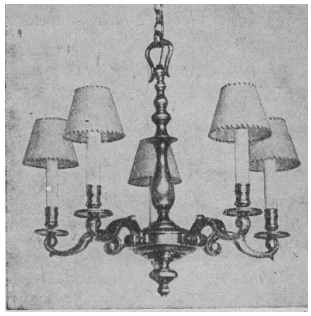
Lighting the Kitchen. Kitchen lighting is of still greater importance from the practical point of view. A good kitchen central light is a 100-watt lamp enclosed in a bowl of opal glass fixed close to the ceiling. A light should also be placed over the stove, while one in the larder and in the kitchen cupboard saves much time and trouble.

Bathroom lighting also is satisfactory with a diffusing central opal globe enclosing a 60-watt lamp. A small fixture is useful over the bathroom mirror with a 25-watt lamp. Should the mirror be used to shave by, the light may be fixed underneath so that it shines upward on the chin.

Period Fittings. While it is obviously absurd to talk of Tudor or Queen Anne electric fittings, the lighting fixtures have to be brought into decorative harmony with such period styles in furnishing, as expensive forms of concealed lighting are impracticable for most people. In a bedroom the most important lighting fixture, besides that for the dressing table, is a good reading lamp or bed-head light. For a country

bedroom wooden wall brackets in oak are designed to hold candle lamps which are in keeping with old-world furniture.





Electric Light. Fig. 6. Wall brackets and central fitting for a lofty room. (Courtesy of Waring & Gillow)

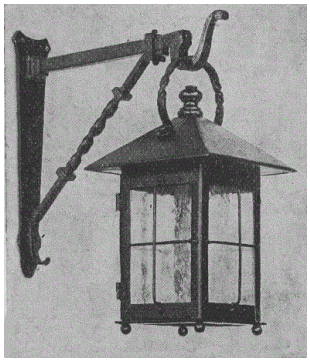


Fig. 7. Lantern fitting in wrought iron suitable for a hall or staircase.(Courtesy of General Electric Co.)

The simple central fitting in tinted glass illustrated in Fig. 5 is suitable for a dining room or sitting room, and is pleasing whether used with modern or 18th century style of furnishing. In a dining room such a fitting can be hung rather low over the table. The lofty and good sized panelled room of Georgian style is suitably lighted by gracefully shaped wall brackets and a ceiling fitting as shown in Fig. 6. For a lower room the centra] fitting is often dispensed with, the wall lighting being supplemented by standard lamps in equally harmonious designs.

Lantern fittings in wrought iron look particularly well for panelled halls and staircases or for rooms with oak-beamed ceilings. The one illustrated in Fig. 7 is a good example, and such lanterns may be either suspended on chains or hung from wall brackets made of the same metal. The latter plan is suitable for rooms or staircases with low ceilings.

In a hall a bracket light is convenient over the mirror; a 60-watt lamp will suffice for the ceiling fixture, and a 40-watt for the bracket, and also for a landing or staircase wall light in a small house.

ELECTRIC MOTOR: ITS CARE AND USE

With Instructions on Building a Model Motor

In the first part of this article we give hints on the care of fractional horse-power motors. The second describes a model motor which the amateur can build. See Boat page 196.

Small motors—fractional horse-power motors, as they are termed—are used for many domestic appliances, and the handicraftsman can employ a suitable type to run his lathe or other small machinery.

As a rule, the household appliances-—vacuum cleaner, washing machine, refrigerator, etc.—are covered by the maker's guarantee, and the motor or machinery should not be interfered with. It may be an advantage, however, for the handy man to know how to deal with minor defects on other small motors.

The electric motor working under industrial conditions is a prime mover giving the greatest service with the minimum of attention. The essentials are to keep the oil reservoirs for the bearings properly cleaned and filled with good oil; to see that the lubricating rings are travelling or carrying oil to the shaft; to keep the brush gear, commutator and windings free from dust, dirt and oil; to make sure that the commutator is clean, and that the brushes are properly bedded to the curvature of its circumference.

To clean an oil lubricated bearing, first remove the drain plug, where this is provided, or the overflow pipe when it is not, and draw off the old oil. Replace the plug and fill the reservoir with paraffin until it reaches the top of the overflow pipe. After a while this can be drained away again. After refitting the plug fill the reservoir with fresh oil, and replace all oil-hole caps.

A motor fitted with ball bearings need not usually be disturbed more often than once every twelve months. The wisest plan is to get an electrical engineer to repack the ball race with grease, since the bearings require properly fitting and adjusting.

Oil must be wiped away from brush gear, commutator and windings, and all dust and dirt either blown out with a bellows or otherwise removed. Oil, unless removed, may penetrate the insulation of electrical machinery and prepare it to receive the dust and dirt which so often leads to a breakdown.

A careful inspection of the commutator should be made before this part is touched. If it is of a coppery colour its condition is healthy, and no more should be done than just wipe it with a clean rag. Otherwise, the surface can be polished with fine carborundum cloth wrapped round a piece of wood and held against it while the armature is revolved. Care must be exercised with a commutator that is ventilated or has undercut micas, to ensure that copper dust does not fall between the segments and set up short circuits. A commutator of the latter type should have periodical attention by an electrical engineer.

To bed carbon brushes properly to the commutator surface a strip of carborundum cloth should be inserted between the brush and the commutator (with the cutting face towards the brush) and carefully drawn backwards and forwards until the whole of the carbon face has been shaped.

Electric Motor for Toys. The small electric motors that are nowadays used on toys usually work on both alternating and direct current. Some small motors are constructed with a permanent magnet instead of a field winding, as, for example, the smaller boat motor shown in page 196. These will only work from dry batteries, such as the Ever Ready No. 126, or a special light-weight accumulator.

The construction of a small motor suitable for driving a toy boat or for any other small-power purpose is not difficult, as all the parts can be pur-

chased in the rough. Figs. 1-6 show a practical type of motor with horizontal field magnets; the winding is at the back, and the whole is low and compact, and adapted for almost any kind of mechanical toy. Castings may be obtained from Whitney's, 129, City Road, London, E.C.I.

Electric Motor for Toys. Figs. 1-6. Plan and diagrams of a small electric motor suitable for driving a model boat
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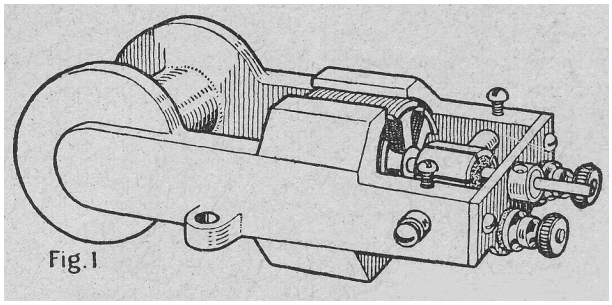


Fig. 1

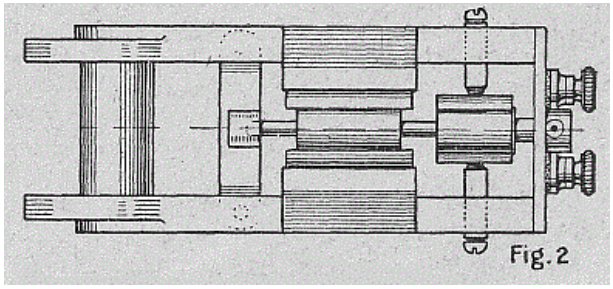


Fig. 2

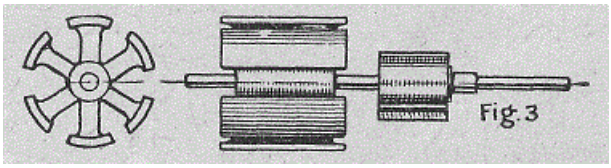


Fig. 3

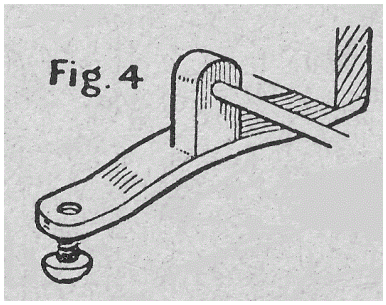


Fig. 4

Electric Motor for Toys. Figs. 1-6. Plan and diagrams of a small electric motor suitable for driving a model boat.

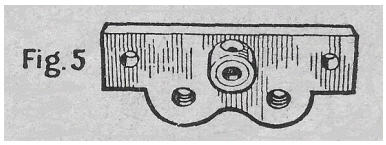


Fig. 5

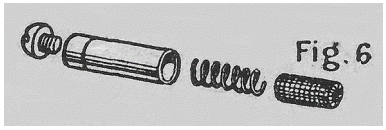


Fig. 6

The field magnet tunnel should be bored in a lathe, but if this cannot be done it must be carefully cleaned up to shape with a half-round file. Then the various holes are drilled and tapped as shown on the drawings, and the field windings put on. Each layer must have just the same number of turns of No. 22 D.C.C. wire, and is insulated with a thin slip of waxed paper, and the wire coiled evenly. For the motor in question 36 feet of wire will be needed. Before winding, the cone and side cheeks should receive a covering of several thicknesses of waxed paper. The armature casting is drilled and fitted to the shaft, and the arma-ture poles trimmed up if required so that they just clear the poles of the field magnets. The casting is secured to the shaft by a grub screw, a hole being drilled for this through one section.

The armature windings are No. 24 D.C.C. Each slot holds two layers with six turns each, and 13 ft. of wire will be needed. The wire should be given a coat.of shellac varnish. All turns of the wires are made around the armature cores in the same direction. Each winding starts on one side of the cores and terminates on the other. The starting end of the first coil is attached to the commutator segment two places away from the pole piece, and the finishing end, twisted up with the starting end of the second coil, goes to the next adjacent segment of the commutator, and so on. The finish of the last coil is joined to the same segment as the beginning of the first coil. The slots in the commutator are set exactly opposite the centre of the pole pieces. The latter should be insulated with cotton tape.

The back bearing (Fig. 4) is attached to the main casting underneath by two screws. Fix it temporarily and mark the position of the hole for the armature shaft. The hole for the shaft should not go right through. A small oil hole is made on top and countersunk a little way with a larger drill. Two holes are drilled in the frame and tapped for the screws. The bearing should be positioned so as to bring the armature in line with the field magnet poles, and the armature must of course turn quite easily and just clear the poles.

The brushes (Fig. 6) are made from narrow strips of copper gauze rolled up to fit inside the brush holders, and are held against the commutator by coil springs made from steel wire. A hole is drilled through the top of the frame and tapped to take a brass screw which retains the brush holder in place and allows it to be adjusted. A hole for each brush holder is drilled through the face of the frame, large enough to take a fibre insulating bush, through which the holder passes. The brush holders may be made from brass tube, a nut being soldered on to the outer edge for the terminal.

The front bearing of the armature shaft is a boss on the bridge piece (Fig. 5), the latter being attached by two screws as shown. The boss is drilled through and an oil hole formed on top. Holes are needed also for the two terminals. The latter require each a fibre bush. A hole is drilled through each of the fixing lugs, to fasten the motor to its bed.

The Commutator. The commutator has six segments. It is formed from brass tubing, driven on to a piece of fibre rod. The position of the segments being marked out, pins are driven into the fibre through holes drilled in each segment, and the segments are

parted by making slots with a hacksaw. Take the slots clean through the brass ferrule and well into the fibre. The pins prevent the segments from coming away from the fibre. A hole is drilled through the axis of the fibre, and the commutator is driven on to the armature shaft, to which it must fit tightly. The armature will find its own running position in relation to the field, and the shaft is then positioned correctly in the bearings by slipping a short piece of brass tube on the shaft between commutator and front bearing. This forms a washer, and its length must be such as to afford sufficient play between front and back bearing. The latter forms a stop for the back end of the shaft.

The wires from the field coil go one to the lower brush shown in Fig. 2, and the other to the lower (nearest) terminal. The other brush and terminal are connected together by a short piece of wire. The accumulator positive is joined up to the upper terminal and the accumulator negative to the lower terminal. The appearance of the finished motor may be seen from the illustration in the article on Boat, where also a suitable propeller, coupling, and shaft are shown. A 4- to 6-volt accumulator will energise the motor, and if it is desired to use it in a model boat a special lightweight low built type of accumulator can be employed. Should this or any similar motor not work, the whole of the connexions should be examined; if they are in order the windings should be tested for continuity, and it should be ascertained if there is a leak to the frame of the motor. The commutator segments should be examined, as it is possible that a short circuit is occurring between one segment and another. If the motor still refuses to work, then the adjustment of the brushes will have to be tried.

ELECTRIC SHOCK. A severe electric shock causes a person to cry out, and he may fall to the ground and stop breathing. If he remains in contact with a live wire the current should be turned off. If this cannot be done at once, his connexion with the wire should be broken; but proper precautions must be taken in doing so. The rescuer should stand on a pile of dry clothing, if a dry rubber mat is not available, and his hands should be covered with rubber gloves, tobacco pouches or dry woollen clothing. A dry stick, if at hand, may be used to push the wire off the body. It will be noted that emphasis is laid on everything used in connexion with the rescue being dry, as moisture conducts electricity readily.

If the patient has stopped breathing, artificial respiration (q.v.) should be carried out. Smelling salts may be held to the nose, or if the patient can swallow he may be given diluted spirits of sal-volatile. He should be kept as warm as possible.

ELECTRODE. In a primary cell electrodes are the plates or elements. The electrode most vigorously attacked by the electrolyte is known as the anode, and the other plate as the cathode. The poles or terminals of an electric battery are known as electrodes also. *See* Battery.

ELECTROLYSIS. The operation of breaking up chemical compounds by passing an electric current through them is termed electrolysis, and when skilfully performed it is effective in removing superfluous hairs, birthmarks, moles, and for other purposes. Living tissues are killed by electrolysis, the area of destruction varying with the strength of the current and the length of time for which it is used. A caustic effect is produced, but there should be no scar if electrolysis is performed by a skilled operator. As this method for destroying superfluous hair requires so much time and patience it has to some extent been superseded by diathermy. Electrolysis is applicable to scattered hairs; comparatively few can be removed at one sitting, while by diathermy as many as 200 can be depilated by a skilled operator. When used to destroy naevi (birthmarks) a general anaesthetic is usually necessary, especially in the case of children undergoing the operation. Electrolysis is sometimes effective for the cure of aneurism and hydatid cysts. *See* Depilatory; Hair.

ELECTRO-MAGNET. The combination of a coil of wire and an iron core is known as an electro-magnet, the wire as conductor carrying an electric current round the iron bar in the centre. It has a common application in the electric bell. *See* Bell; Relay.

ELECTRO-PLATE. The wisest thing when purchasing electro-plated table forks and spoons is to go to one of the leading firms of silversmiths or general stores and to pay the price for a quality that can be recommended by the retail dealer. Even if the best qualities which are marked A.I, E.P.N.S., are not within the reach of the purse of the prospective purchaser, there are other qualities, known in the trade as B and C. which are reliable, provided they have the recommendation and guarantee of an old-established retailer. The patterns of table forks and spoons that are most popular are those which are simplest in design, such as the old English and fiddle patterns.

It is best to wash plated ware in hot water to which a few drops of ammonia have been added with enough shredded soap or soap powder to make a good lather. The electro-ware should be thoroughly washed in this water, a soft mop or piece of flannel being used. It should then be rinsed in very hot, clear water, and immediately dried in a dry, soft towel After drying, rub with chamois-leather.

ELECTRO-PLATING FOR THE AMATEUR
How to Coat Small Articles with Silver or Nickel

This article describes the process of electro-deposition and explains how to make solutions for copper, nickel and silver plating. The work also contains entries on a number of articles to which the process can be applied, e.g. Bowl; Crumb Scoop.

The process of electrically depositing one metal upon

another is known as electro-plating. The home-worker can do a great deal with an inexpensive outfit, provided only small articles have to be plated, and the first thing is to clean them.

The amateur is counselled to treat all articles of brass or copper as follows. First clean and polish with fine emery-paper, or on a buff in the usual way, then attach a fine wire to the object and immerse it in a solution of potash. The solution is composed of 2 oz. of caustic potash to 1½ pints of water. This must be brought to boiling point, and the articles immersed until perfectly clean. Rinse them in clear hot water, and then place them in a potassium cyanide solution, composed of 4 oz. potassium cyanide to 6 pints water.

The cyanide is an extremely poisonous substance, and the greatest care should be taken in using it. The hands and arms must be kept well away from these solutions, and the fumes must not be inhaled. The articles must be wired so that they need not be touched with the hands.

The process of electro-deposition is briefly as follows. When an electric current is allowed to flow from one immersed terminal to another through a metallic solution (the electrolyte), and the anode, or terminal at which the current enters the solution, is of the same kind of metal as that in the solution, the metal will be conducted from the anode and deposited on the cathode. This ultimately results in the cathode becoming heavily coated with the metal and the anode being either reduced in size or entirely dispersed. If metal articles to be plated are arranged and connected so as to form the cathode, they will therefore become coated with metal *(see* illus.)

Batteries and Bath. Assuming that only small articles are to be dealt with, the following outfit may be suggested. The source of electric current can be a 4-volt accumulator of 40 ampere-hour capacity; or a Bunsen battery or Daniell cells may be used. The bath can be a glazed earthenware jar, deep glass bowl, or a wood vat. Some stout brass or copper rods ⅛ to 3/16 in. diameter, and long enough to span across the mouth of the jar, are needed on which to hang the articles to be plated. These rods are most conve-niently provided with binding screws or terminal nuts at one end for easy attachment of the electric conductor or wire. Copper wire of 24 and 16 gauge is needed, the fine wire for wiring small articles and the stout 16 gauge for the larger ones.

The next requirements are the metals and solutions. Iron and steel articles are first coated with copper, and a solution for plating is composed of 4 oz. of copper sulphate dissolved in 12 oz. of distilled water. Add a strong solution of ammonia until no more green crystals are precipitated: add more ammonia solution, until the green crystals are re-dissolved, resulting in an intense blue-coloured solution. Then add slowly a strong solution of potassium cyanide until the solution is clear. Add ¼ as much again of the same potassium solution, and water to make 2 quarts. The anode may be a perfectly clean piece of copper plate or bar.

Silver Plating. For silver the solution may be prepared by dissolving ¾ oz. of silver nitrate in 8 oz. of water, and adding slowly a strong solution of potassium cyanide. Pour off the liquid and wash the white precipitate carefully by putting it in a corked bottle, partly filled with water. Shake it well, stand it aside and allow the precipitate to settle. Pour away the water, refill, shake up and allow to settle as before. This should be done until the precipitate is clean.

After this washing, add a solution of potassium cyanide until the precipitate is entirely dissolved. Then add about ¼ as much again of the same potassium cyanide solution, and make up to 1 quart with water. This kind of plating requires from 2 to 4 volts, and a pure silver anode must be used. Iron, steel, zinc, lead, and pewter should be copper-plated immediately before the silver plating is effected.

A "quicking" solution of 1 oz. of potassium-mercury-cyanide, 1 oz. of potassium cyanide, and 1 quart of water should be prepared. Articles that have been copper plated are first cleaned and pickled, immersed directly into the quicking solution, and left there until the surface is uniformly covered with mercury, when they are rinsed in clean water and placed in the silver-plating bath.

First coating with mercury in this way gives better results than direct deposition on the copper, as the silver adheres much better. Iron and steel articles should be kept moving while being plated. The silver will be deposited in from 20 to 30 min., and if all is correct the article will appear dull or lifeless and nearly white, and must be polished with scratch brushes, rouge, and buffs. A small polishing head is very handy for this work. Gold can be deposited in the same way, using a gold anode and a solution of the double cyanide of gold and potassium in distilled water.

Nickel Plating. Nickel plating is similar to copper plating, and a suitable solution for it is composed of nickel ammonium sulphate, 1½ oz.; ammonium sulphate, 1½ oz.; water 1 quart. Hot water will fasten the dissolution of the crystals. An electric current of 2 volts, and density of 5½ amperes per sq. ft. of area of the article to be plated, is required for this solution. Pure nickel is used for the anode.

Electrical connexions are completed directly the objects are placed in the bath of solution; the anode is connected to the carbon of a battery, or the + sign of an accumulator, and the cathode is connected to the zinc of the battery, or to the — sign on an accumulator. Do not allow any article being plated to touch the anode or the sides of the vat, or a short circuit will result. Place the objects into the vat and see they are all clear of each other before switching on the current.

Plate as many objects as possible at one time. Prepare the objects by cleaning, etc., immediately before plating; do not leave them hanging about, or they will get dirty and the result will be failure. See

that all connexions are securely made. Judge the correctness of the work by watching results.

ELM: The Wood. The elm is a hardwood with rather limited uses, though excellent for some purposes. The English variety is a dark brown colour with curly and plaited grain, which does not split easily.

Elm is not used for building and very little for furniture, not being durable enough for the first, while its appearance is against it for the second; besides which, it is liable to warp. The bodies of barrows are often of elm, and it is largely used for wheelwright and agricultural purposes. *See* Wood.

EMBEZZLEMENT. This is a form of theft by a servant or clerk from his employer. It differs from larceny in this: a servant commits larceny when he takes money or property of his master out of the master's possession with the felonious intent of depriving the master of his property. He commits embezzlement when, having money paid to him for his master, he appropriates it for himself with the intention of not accounting for it as he ought to do.

The punishment for embezzlement is imprisonment up to 2 years with or without hard labour, or penal servitude for not less than 3 and not more than 7 years. The court has also power to deal with a first offence under the First Offenders Act. Besides by clerks and servants, embezzlement may be committed by partners as against their co-partners, and also by one joint owner against another, and by public officers who may not be strictly clerks or servants.

EMBOLISM. When some solid body is carried along by the blood stream until the narrowing walls of a blood vessel prevent it from going farther, the result is embolism or stoppage of the blood vessel. If an artery of the heart is blocked death will ensue, and the result will be serious if an important artery of the brain is affected. Pending the doctor's arrival the patient must be kept at rest.

EMBROCATION or Liniment. The liquid preparation known as an embrocation or liniment usually contains oil or spirit, to be rubbed in or applied outwardly to the skin in sprains, chronic rheumatism, chronic lumbago, etc. Examples are camphor and ammonia liniment, soap liniment, belladonna liniment, etc. Liniments act mainly as counter-irritants (q.v.). A useful liniment for relieving pain is the following:

Chloral hydrate	1 part
Menthol	1 „
Thymol	1 „
Camphor	3 parts

The following is a stimulating liniment for sprains, chronic stiff joints, etc.:

Oil of turpentine	12 oz.
Soft soap	1 ½„
Camphor	5 „
Water	5 „

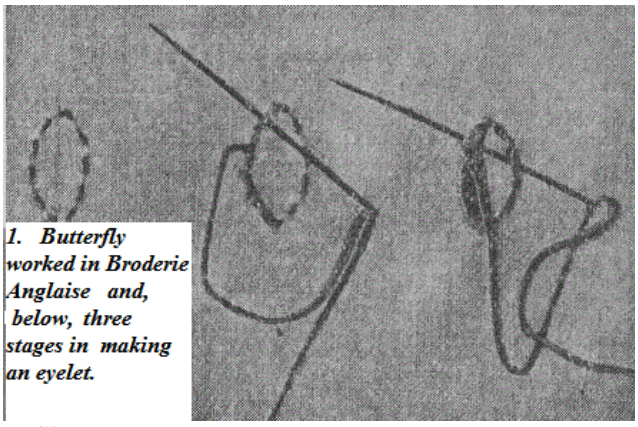
For chest complaints in young children camphorated oil is a favourite liniment, but care should be taken lest undue irritation of the skin is set up by too vigorous rubbing.

EMBROIDERY FOR HOME AND DRESS
Decorated Needlework Described in Detail

For related information see Applique; Canvas; Gross Stitch; Darning; Drawn Thread; Lace; Tapestry; Woolwork. See also Cushion; Table Cloth; Tea Cosy, etc.

The embroidery of today can be described under two headings. There is first the work which consists of the use of simple decorative stitches combined in modern designs, realistic, imaginative or formal. This work is comparatively easy to do, and some charming and gay effects can be quickly achieved with very little trouble. Then there is the more elaborate work of the fine needlewoman, and all intricate traditional embroidery, which will never lose its popularity.





1. Butterfly worked in Broderie Anglaise and, below, three stages in making an eyelet.

Simple Modern Needlework. The first class of work makes it more possible for the average woman with little experience and little spare time to produce quickly achieved and attractive work. Some of the simplest stitches are the most charming in effect, and simple designs consisting of straight lines or curves can be most attractive if carefully planned combinations of stitches are used. Some stitches, used in a way that is not obvious, add greatly to the attractiveness of the design. Chevron stitches, for example, massed together to fill in a design, give the delightfully crisp effect of smocking. If a transparent material such as organdie is

used, double backstitch worked on the wrong side, so that the crossed stitches show through, give an exquisite shadowy effect. Rows of buttonhole stitches, each row being worked into the last one, make a very attractive modern filling stitch, and rows of fly stitch making a design of lozenge shapes has also an unusual and pleasing appearance.

After a little practice it becomes easy to discern which stitches should be used for each kind of design, and which stitches should not be used together. The more unusual filling stitches, such as those mentioned above, should not be used, for instance, for formal flower designs. For these, satin stitch, long and short stitches massed together, and other smooth stitches are more suitable, with occasional French knots and lazy daisy stitches where necessary. For the flower group the main stitches used are satin stitches for smaller leaves and petals, and long and short stitches for the larger ones. The round design with the four figures is much more gay and sprightly, and here the main stitch used is double back stitch, worked in rows, giving a very modern crisp effect which would be completely out of place in the more formal flower designs.

Transfers of widely varied embroidery designs are easily obtainable, and the actual stitches and colours to be used in working out the design are usually left to the imagination. Simplicity should be the main rule in choosing these. Too many different styles of stitch make the general effect as unpleasing as a badly conceived colour scheme, but the appeal of the design is usualfy strong and direct if worked in a few well-chosen stitches and colours.

Simple designs for the corners of table mats and napkins, tray cloths and tea cloths can be easily invented when the possibilities of the various stitches have been grasped. There are many variations and elaborations of these, and some of them can be attractively combined for borders and patterns. Chain stitch, for example, is very easy to elaborate, and a very pretty border can be produced by working French knots, in a second colour, in the angles of a zig-zag chain. Double chain stitch is also very attractive, and is worked by making open triangular chain stitches first to the right and then to the left.

Interlaced buttonhole stitch makes a very firm fancy border, and two colours can be used. The stitches in the first row should be made just wide enough apart for the stitches in the second row (worked from the opposite side) to lie between them. Also the length of the buttonhole stitches can be varied to form a regular pattern, or they can slope in alternate directions, to form crosses. A very pretty stitch is made when herringbone or double back stitch is laced with a different coloured thread. This is called twisted lattice stitch. Simple feather stitch can be elaborated by taking the open stitches twice or three times to each side instead of once.

Fine Embroidery, Various Kinds

Of the fine traditional embroidery, embroidery on white materials, embroidery on linen or canvas, embroidered laces and tapestry are among the most important. Tapestry work is dealt with in a separate article.

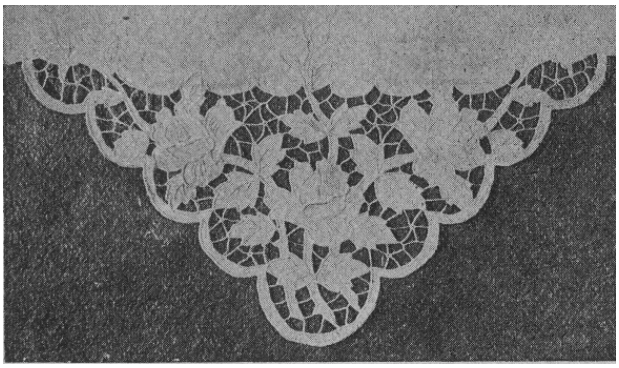
For elaborate and fine work of this kind, for work where large expanses of material are to be filled, and also for appliqué work, it is advisable to use a simple embroidery frame. It not only keeps the work flat, but makes it possible, in creative work, to see the whole design in perspective while it is being done —the various colour effects and the relation of one detail of design to another. Also both hands are left free for the actual working of the stitches.

Embroidery on White Materials. This class of embroidery includes all openwork such as Madeira work and Broderie Anglaise, and all barred work such as Richelieu and Renaissance embroidery.

Madeira work and Broderie Anglaise need great care and accuracy of workmanship. They consist of round and oval eyelets arranged in a design, varied with solid satin stitches for stems, leaves, petals and circles. The design is transferred to the material and the eyelets are outlined by running stitches, and the running stitches are then whipped. The ovals or circles intended as eyelets are slit with fine scissors down the centre and the larger ones are slit again crosswise. The cut material is very carefully rolled back underneath until it reaches the running thread all the way round, and the outline is then overcast closely and neatly. Very small holes are pierced with a stiletto, not cut. The solid work is first padded with rows of running stitches or crossed stitches in the case of small round or oval spots, and then smoothly satin stitched. The border is usually worked in a simple or elaborate form of buttonhole scalloping. Fine embroidery cotton is usually used for this work, with a softer and thicker thread for padding. For real Madeira work a greenish blue thread is usually used against a white background, and much of the finest Swiss embroidery is worked with a blue-grey thread. Any good material can be used (linen, crêpe-de-chine, lawn or heavy Japanese silk).

Richelieu and Renaissance embroidery is usually worked entirely in buttonhole stitch, which outlines the design and forms bars to hold the pattern together. The bars are made by passing a foundation thread from outline to outline three or more times, and button-holing over the strands without sewing the material beneath. When all the bars in each section have been made, and the outlines have been buttonholed, the surplus material beneath the bars is cut away from the back. The bars may be worked by overcasting the foundation threads, or a weaving stitch may be used. Ornamentations (picots) may be made on the outside edge of flowers and leaves by making various kinds of knots or spirals of thread drawn round into a circle, or

loops of buttonhole stitch worked on semicircles of thread, and in Richelieu work the connecting bars also may have picots.



Embroidery. Fig. 2. Renaissance work, an effective form of embroidery for white materials, such as the tablecloth shown here.

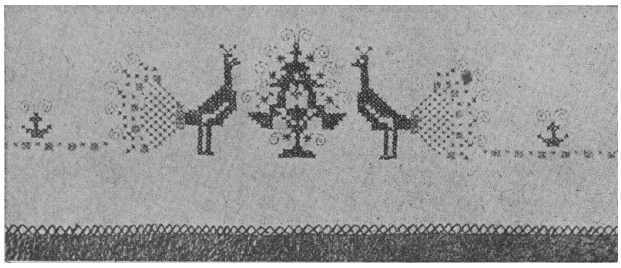


Fig. 3. Cross-stitch in colour on white linen, suitable for the border of a duchesse cover.

In Venetian embroidery, the plain linen spaces are afterwards filled in with fancy stitches and fillings. In Danish hedebo work, openwork produced by bars is combined with open lace stitches worked over the plain material, which is afterwards cut away. Little square openings are made, on counted threads, and these openings divide the whole work into squares and triangles. Designs of open lace stitches, worked over the plain material, which is afterwards cut away, are combined with figures worked in padded satin stitch and stem stitch.

Piqué embroidery is done on a firm background, and the main outlines of the design are filled in with fancy stitches to represent figured materials or damask. The main outlines are chain stitched and overcast, and the interior of the designs are filled in with various embroidery stitches which are intended to represent figured material on damask. Horizontal, vertical or sloping flat stitches are used for these fillings, and the work is done closely, so that very little of the material background shows.

Embroidery on Coarse Linen. One of the most popular forms of embroidery on coarsely woven linen is cross stitch work, which can be done wherever the stitches can be easily counted. A specimen is illustrated (Fig. 3), where cross stitch is combined with darning stitch (used for the peacocks' tails and for the flowers on the shrubs). Most of the old samplers were worked in cross stitch, and a surprisingly wide range of designs can be adapted and executed in this useful and very easy stitch. Charts are easily obtainable showing the position of each stitch on the counted threads of the linen or canvas, and the colours to be used are indicated.

Darning stitch also is very simple to do, and can be used to fill in designs which are outlined in stem stitch or some other bold outlining stitch. Embroidery of this kind is known as Khetha work, and a sample is illustrated at (Fig. 4). The stamens are here suggested in satin stitch. The background of the material, on the other hand, can be filled in with darning stitch, and the design left plain. In this case, the edge of the design is outlined, and French knots and single cross stitches are used to indicate the centres of flowers, etc.

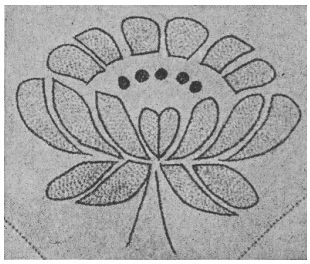
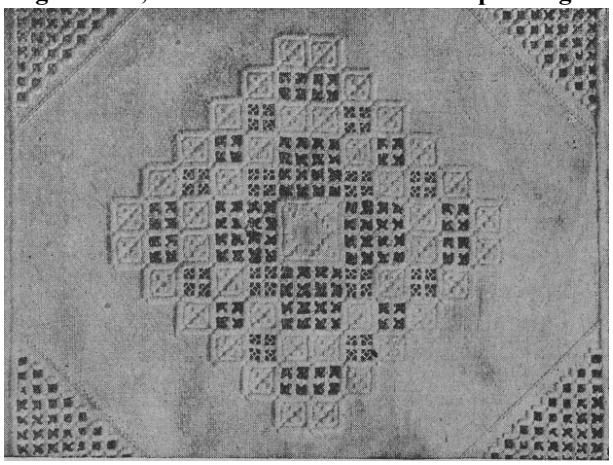


Fig. 4. Khetha work, in which the effect is chiefly produced by the darning stitch.

Norwegian hardanger work (Fig. 5) is a form of openwork which can be done on loosely woven linen, on canvas or on any material where the threads can easily be counted. Bars of buttonhole stitching, with picot ornaments, are used where the material is cut away, or the bars are worked in darning stitch and loop stitch, and the pattern in straight stitch, which is satin stitch without padding.



Embroidery. Fig. 5. Hardanger work. Design for a table runner worked on loosely woven linen or canvas.

Punch work produces a drawn thread effect (Fig. 6) by means of a special punch needle, without the trouble of drawing threads. Various outline stitches may be used for the pattern and satin stitch, for flower centres, the punched holes of the background being worked with tiny hem stitches.

Hungarian embroidery is worked on coarse unbleached linen, the rougher the better, in gay colours and bold designs. By these means beautiful effects are gained.

Distinctive names are also given to other kinds of embroidery, some of which are of a national character. In all work classed as linen embroidery clear spaces of the material are left between the designs, the whole

ground never being covered as in tapestry work.

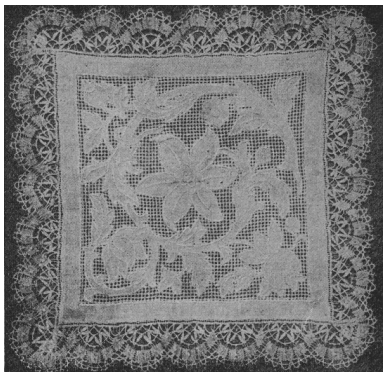


Fig. 6. Punch work. Effective design for linen mats edged with lace, suitable for a luncheon set (Courtesy of Harrod's, Ltd.)

Silk and Velvet Embroidery. Embroidery on silk and velvet requires special care. The design cannot be satisfactorily marked on the right side of velvet; it must be lightly traced on the back and the outline followed with white tacking thread, so that the tacking stitches are prominent on the right side of the material. If the work is too big to hold over the finger, an oblong frame must be used, as a pile material cannot be pressed into a round frame. A piece of stout calico should be sewn round the edges of the velvet, and by this it should be laced to the frame with long stitches, the top and the bottom edges first, getting them quite taut, and the sides last. Ordinary embroidery stitches are employed, but in the case of chenille, which cannot be drawn through the material, it must be couched down as in laid work (q.v.). Beautiful work is done by copying Japanese and Chinese designs. Chain stitch is much employed for bouquets of flowers, while needle painting is done by means of a flat embroidery stitch and colour shading.

Gold Embroidery. This includes all embroidery done with gold and silver threads. It is expensive work, so is only employed where very rich effects are desired, such as ecclesiastical ornaments and vestments. It requires a strong foundation, such as brocade, velvet, or thick cloth. The padding for bold designs is done with ordinary white padding cotton, only the surface stitches being worked with gold thread. The working threads should be handled as little as possible, and a fine stiletto is a great help in making small holes for coarse threads to pass through. This work requires much practice, and in some countries many years' apprenticeship is served in it.

Appliqué Embroidery consists of the laying of pieces of one kind of material on a foundation of another kind to form a pattern, giving the effect of patchwork, but carrying out a definite design. It comes under embroidery in its modern form, as the designs are sometimes attached by means of buttonhole and fancy embroidery stitches, while the centres are filled with ornamental stitches and lace fillings instead of the old corded edge or plain fell stitch. It stands out in bold relief, and is quick work in comparison with ordinary needle embroidery. Hence its popularity for the decoration of cushions, curtains and bedspreads.

The small pieces that form the design should be tacked down in position before working, putting the tacking threads near the edge of the top piece and working over them when doing the embroidery. They can be drawn out afterwards from the back of the work. In the case of floral designs the veinings of leaves and the special outlines of flowers can be worked afterwards through the two materials. By this method the motifs are kept in position with embroidery stitches, which is more popular than the old method of pasting the top material to the foundation.

Embroidered laces come under the same heading as canvas embroideries, where the background is of a loose texture, and all kinds of fancy lace stitches and fillings are used, and others producing a drawn-thread effect. Colbert embroidery comes in this class, and includes imitations of Dresden lace stitches and damask stitches and open fillings. Fancy darning on net is included under the title of embroidery laces, but work done on filet net comes under a title of its own and is a special class of work. *(For embroidery delicate stitchcraft see page 756 and for instructions how to make principal stitches see page 758)*

EMERALD. These beautiful gems are usually set in combination with finest diamonds. The stones that are deep green and perfectly transparent are higher in value than almost any other gem of the same size or weight. Less valuable emeralds are those in a lighter shade of green in which there are white or dark quartz-like markings. These stones when closely examined have the appearance of being cracked, but notwithstanding these natural flawlike markings, they command very high prices.

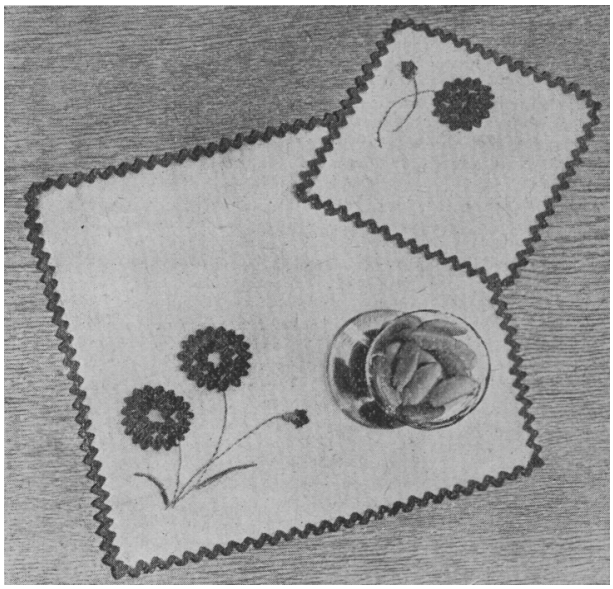
Emeralds should always be set in gold claws or in gold band settings, the latter having the upper edges with milled grain finish which gives the gold band the appearance of having had a very fine file drawn across it. Though diamond ornaments may be set in platinum, emeralds used in combination with brilliants should be set in gold.

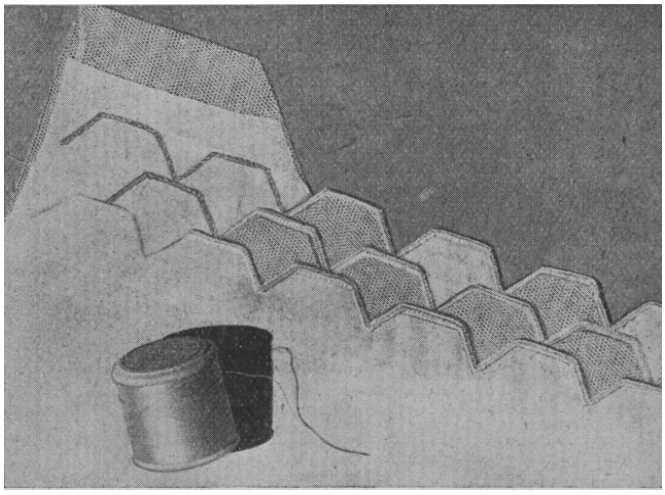
The under side of the settings of gems is invariably open, to enable light to be reflected through the facets of the stones. Therefore it is easy to keep emeralds or similar gems free from dust or soap by brushing the backs of the stones with benzine. Another method is to brush them with eau-de-Cologne or some other spirit which will easily evaporate. A soft toothbrush is best suited for the purpose. Care should be taken to prevent emeralds from becoming scratched as they are much softer than other gems.

In recent years the emerald has been so closely imitated that the stones known as synthetic emeralds are almost indistinguishable from the real gems. These copies not only reproduce the clear emerald, but also the stones with quartz markings. *See* Jewelry; Ring, etc.

EMERY. Emery is a very hard mineral, a variety of corundum. Owing to this quality, it is used for

(Continued in page 758)





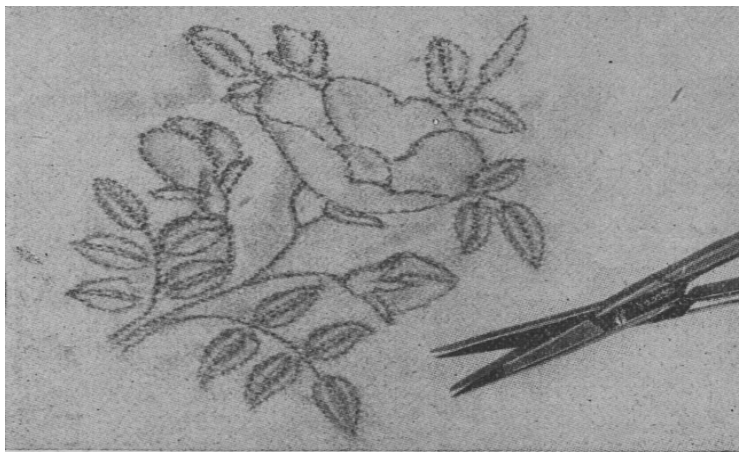
Left: Place mats and glass mats in organdie and royal blue rick-rack braid. They need no transfers, and the same idea can be adapted to other uses. Right, above: Dainty edging for lingerie. Net is placed beneath the material, and the pattern is buttonholed. Where desired, the top material is cut away, revealing the net.

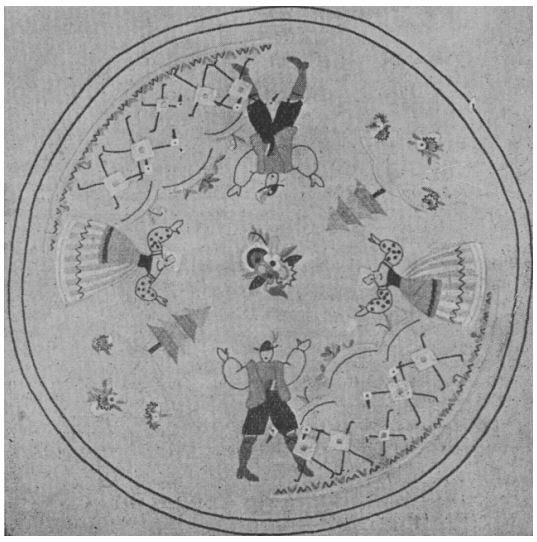


Left: An exquisite flower design. The lupins are worked in pink and mauve; the harebell spray and clematis blossom and leaves in natural colours. Clever needlewomen will invent many other designs.

Right: From an old-world flower print, this exquisite honeysuckle design is worked in simple stitches, in natural colours of flowers. Stranded cotton was used. Full size about 9 in. square.

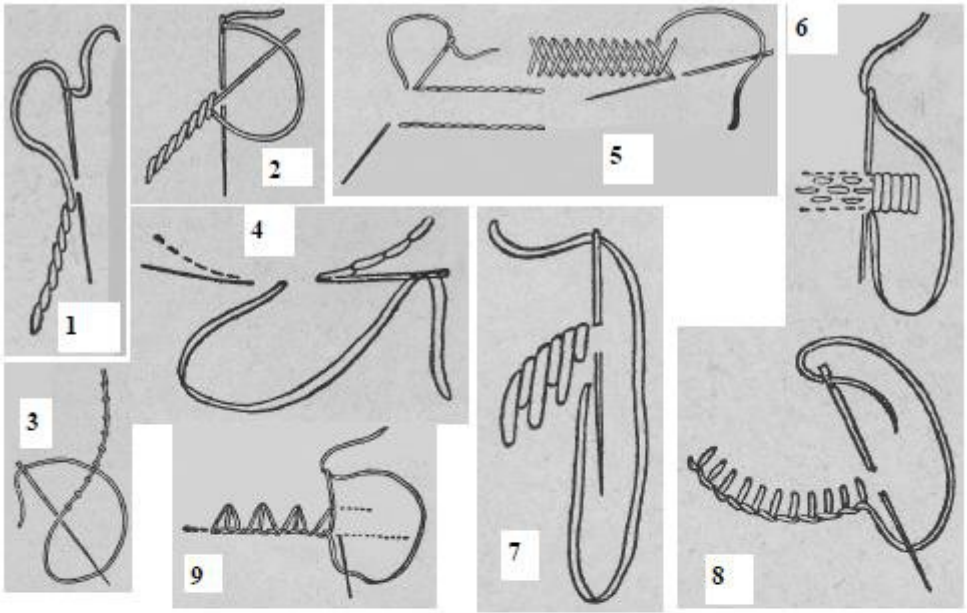






Left, above: "Shadow" work motif, worked in double back-stitch. The sterns are outlined with ordinary back-stitching. Right: An original "Quarrelsome Couple" motif makes an attractive design on a tea or breakfast cloth, a tea-cosy set, or a round cushion.

EMBROIDERY: HOW TO MAKE THE PRINCIPAL STITCHES USED IN THIS FORM OF NEEDLEWORK



1. Stem Stitch.

Take up a little of the material, throw the thread over to the left, and draw it through. Bring the needle out to the right at the top of the last stitch, so that the stitches overlap slightly. Continue in this way.

2. Raised Stem Stitch.

Work this stem-stitch as before, but first lay along the line you are working a thick thread of cotton as a foundation, and take the stem-stitches over it.

3. Snail-Trail.

A useful stitch for stems. Bring the needle up to the right side of the material. Hold the thread beneath the left thumb. About ¼ inch from the beginning put in the needle again, to the left of the thread (putting the needle over the thread which is still under the thumb). Bring the needle up again the other side of the thread, and draw the thread through. A straight stitch and knot will have been formed. Continue in this way.

4. Back Stitch.

Make a straight stitch. Bring the needle through farther along at a distance equal to length of stitch. Make next stitch backwards to fill the gap; bring needle out, leaving another space. Continue in the same way.

5. Crossed Back Stitch.

This is used on transparent materials; it makes a close line of cross-stitch on the wrong side, and two rows of back-stitch on the right. It is worked on the right side. Put in the needle as if for ordinary back-stitch, pass it under the material, sloping it a little down to the second line. Draw it out and make a back-stitch on the second line. Bring the needle up again under the material, leaving enough space to make a back-stitch on the top line as before.

6. Satin Stitch.

Work the stitches across, placing them close together to cover the fabric without overlapping. To get a raised effect tiny running-stitches can be put in first for padding. This stitch should be worked from left to right.

7. Long and Short Stitch.

One long and one short stitch taken alternately.

8. Buttonhole Stitch.

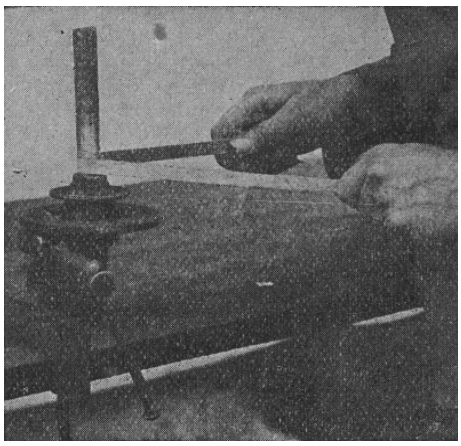
Working from left to right, the needle is passed downwards over the thread.

9. Ornamental Blanket Stitch.

Work like buttonhole-stitch, from left to right; but pass the needle two or three times into the same hole at the top, thus making little pyramids.

abrasive purposes. Emery cloth and emery sticks are made, like emery paper, by coating the particular material with powdered emery mixed with glue or with some other adhesive substance.

Emery Paper. This is invaluable for finishing the surface of metal work. It consists of a paper or linen back coated with an adhesive and evenly covered with powdered emery. The material is available in sheets, rolls, or narrow strips, generally known as emery tape or bands. It is made in many grades, from the finest, viz., FFFF or SF, to a very coarse grain, CF, equivalent in cutting power to a second cut file.



Emery. How to use a strip of emery tape for cleaning up work after it has been brazed.

A specially fine grade of emery paper is much used by jewellers and scientific instrument makers, and sold as blue back. Emery tape is frequently used in lengths of 3 ft. or thereabouts, especially for cleaning up covered work. It is held and manipulated by both hands, one pulling on one end of the tape, the other maintaining an even pressure *(see* illus.).

Emery Powder. This is an abrasive; its most usual domestic application is in the form of knife powder, sprinkled on a leather covered board, against which the knives are rubbed and polished. There are a number of various grades.

Buff sticks, polishing bobs, and similar appliances are coated with emery powder, either by moistening the emery with a drain of oil or by coating the surface of the stick with glue and sprinkling the emery upon it while hot.

Emery Wheels. These are manufactured in a wide range of sizes and grades, from a very small size to large ones requiring a powerful engine to drive them. For amateur use a 3 in. or 4 in. wheel is quite large enough to drive by foot-power, or by means of a small bench emery grinder driven by hand. The latter are invaluable for keeping tools in good condition. *See* Grinding; Polishing.

EMETIC. A number of medicaments are used to induce vomiting, and are termed emetics. Examples are: mustard and water, a tablespoonful of mustard in half-glass of cold water; a full glass of warm water, in which a tablespoonful of salt has been dissolved; a tablespoonful of ipecacuanha wine. This last is a favourite emetic for use with children. A dose of a teaspoonful may be given a child of 18 months in bronchitis where the patient is unable to cough vigorously.

An emetic should always be the first treatment in poisoning by irritants or narcotics, but must not be given in poisoning by corrosives, such as sulphuric acid, etc.

If there is any delay in the action of the emetic, vomiting may be hastened by tickling the back of the throat with a feather or a paper spill. *See* Poisoning.

EMMENAGOGUE. This is a remedy for increasing the menstrual flow when it is diminished in different diseased conditions. One of the simplest and safest means to be employed for this purpose is a very hot hip bath, to which a teaspoonful of mustard has been added for each gallon of water. There are about a dozen official emmenagogues, the most useful being ergot, potassium permanganate and apiol, the essential extract of parsley. Extracts of certain ductless glands have also been of value. Pron. E-men'a-gogue.

EMPHYSEMA. This is a chronic chest complaint in which the air cells of the lungs become over-distended with air, the resulting pressure leading to destruction of the walls of the air-cells. The diminution in the total lung surface thus produced means deficient aeration of the blood. The disease develops very gradually. In advanced cases the chest becomes rounded or barrel shaped, and the patient is round-shouldered. Cough becomes a marked symptom as the disease continues to advance. The patient should live, if possible, in a dry, equable, sunny climate. The bowels should be kept free. Pron. Em-fy-sē'ma.

EMPIRE STYLE. In furniture this name is given to the style which originated in the years after the Revolution in France. An attempt to copy Greek and Roman forms, its characteristics are classical mouldings and pediments, capitals, wreaths of laurel and of palm. Mahogany, satin wood and rosewood were used; a feature of many pieces is the bronze mounts. Tables, chairs and other pieces are also ornamented with mounts in heavy gilded designs. Much of the furniture was silvered or gilded, while the tripod and the X legs for chairs, etc., were often seen. This style succeeded the Directoire in France and then passed to England, where Sheraton made pieces in Empire and also in Directoire style. *See* Dining Room; Directoire; Sheraton.

EMPLOYEE. This word refers to any person who is employed by another, who is called the employer. Most of them must be insured under the national health scheme, and employers are responsible for injuries and accidents that may happen to them while at work. *See* Charwoman; Chauffeur; Groom; Insurance; Servant.

EMPLOYERS' LIABILITY. The liability of an employer for injuries to a servant will in most cases be determined under the Workmen's Compensation Act. In some cases, however, the employer will also be liable either at common law or under the Employers' Liability Act. The sums then recoverable will be greater than the amount of compensation under the Workmen's Compensation Act. By the common law, an employer is only liable to a servant for accidents which happen to the servant through the employer's fault or negligence. He is not liable for injuries sustained by the servant by reason of the negligence of a fellow-servant, even though the fellow-servant is in a position of authority over the one injured.

By the Employers' Liability Act, which does not apply to domestic servants, nor to any employees except those engaged in manual labour, the employer has been made responsible for injuries to a workman resulting from a negligent order given by a person whose order the workman was bound to obey; the defective condition of the ways, works, machinery, or plant; the negligence of a person having superintendence of the work; obedience to the rules or by-laws of the employer.

If an accident to a servant happens by reason of the breach by the employer or anyone for whom he is responsible of any rule or regulation laid down by Act of Parliament for the safety of the workpeople, the employer is liable, quite apart from the Employers' Liability Act. Domestic servants have the rights of any other employee under the Workmen's Compensation Act. *See* Servant; Workmen's Compensation.

EMPLOYMENT EXCHANGE. These institutions are found in every populous centre in Great Britain. At them the unemployed in the district register their names, and it is possible for employers to obtain there domestic servants, charwomen, and others. Application should be made, if possible, in person, to the clerk in charge, who will take down the particulars of the vacant situation and send likely persons along to the address given. No fees are charged. They were established in 1909 and until 1916 were known as Labour Exchanges.

EMPYEMA. Empyema is a collection of pus in a cavity of the body, particularly the pleural cavity between the lung and the chest wall. It may be a sequel to pleurisy with effusion, or it may occur as a complication in infectious diseases like typhoid and scarlet fever, or in consumption and pneumonia.

Empyema may begin suddenly with a chill and sharp pain in the side, made worse by coughing. Then the signs of fluid in the chest make their appearance. In other cases, as in scarlet fever, its onset may be very insidious, with no symptoms pointing to the chest, but it is noticed that the patient shows pallor and declining strength. If after the crisis in pneumonia the patient appears to have fever, the possibility of empyema should be suspected. This is very important in the case of young children in whom the disease, though simulating pneumonia, may be empyema from the start. When a young child supposed to have pneumonia is markedly delirious, empyema should again be kept in mind; also in obscure wasting diseases in children or when the wasting is accompanied by symptoms suggesting tuberculosis of the lungs.

In these cases the doctor diagnoses empyema by drawing pus from the chest, and treatment is to drain the cavity. If the compressed lung expands again the patient may be little, if at all, handicapped thereafter.

EMULSION: In Medicine. An emulsion is a watery mixture with a milky appearance due to its containing oil in fine droplets. Examples are emulsions of cod liver oil and of castor oil. Many people who have difficulty in taking plain cod liver or castor oil can take the flavoured emulsions with ease, as being more readily digestible.

EMULSION: In Photography. Whether on glass, film, or paper for the production of negatives or positive prints, photographic emulsion consists of a light-sensitive salt, such as silver nitrate, suspended in gelatine or collodion. *See* Ferrotype; Film; Plate.

ENAMEL FOR THE DECORATION OF THE HOME
Advice on the Treatment of Furniture, Woodwork, etc.

Here are described the correct methods of using enamel paints, how to re-enamel a bath and how to apply quick drying cellulose finishes. The decoration of small wooden objects in enamel is also included. See Paint; Painting, etc.

The householder rightly looks upon enamel as a high-grade paint, used chiefly for the preservation and decoration of interior woodwork. Metal is extensively enamelled, but with essential differences in treatment, and the articles are usually stoved for 24 hours or so, to bake the enamel. Enamel as applied to jewelry, pottery and other articles is quite distinct from that used by the house decorator. The process is described in the article Enamelling (q.v.).

In the use of enamel for woodwork, etc., preparation of the work is of the highest importance. For new interior woodwork proceed as follows: First rub down the wood with glass-paper, unless it is already perfectly smooth, then brush over all knots with a preparation sold as knotting; when this is dry apply a coat of priming to the whole of the woodwork. Brush the priming well into the wood, and when it is dry, clean it down with sandpaper, remove all dust, and fill up all cracks with stopping and putty. Screw and nail heads, which should be below the surface, must be covered with stopping or putty well pressed in until it is level with the surface.

To close up the pores of the wood, the whole must be given one coat of a suitable under-coating. This when quite dry and hard should be smoothed with old fine sandpaper and dusted; it is followed by a second undercoating of a colour similar to that of the enamel.

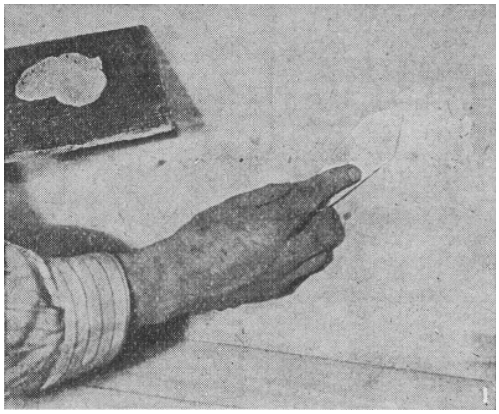
This second coating must be allowed to dry thoroughly and quite hard; it should present a perfectly even colour and a good surface, but will be matt or semi-glossy in appearance. It must not be soiled, or touched with greasy hands. When quite hard give one good flowing coat of the enamel. Interior wall surfaces of plaster or cement must first be primed or filled with a good coat of reliable priming solution; this is needed to stop the suction of the plaster, as otherwise the unequal porosity of the ground work will affect the colouring, the enamel drying with a patchy effect.

New exterior woodwork should be treated in the same way as inside work, except that outside quality material should be used for the undercoats. Exterior white enamel work should be finished with two coats instead of one, the second applied after the first is thoroughly hard and dry. The amateur will probably more often be called upon to deal with existing woodwork that has already been painted. If in good condition, and when the new colour is the same as the old, it will suffice to rub down and wash the paint with soda-water, stop up holes and give one coat of matt enamel or second undercoating, finishing with the glossy enamel. When the old paint is in bad condition it can be well rubbed down, given one coat of stopping, again rubbed down when dry, all cracks filled and then treated as for new work.

Interior wall surfaces, previously painted and in good condition, can be given one coat of undercoating and one of glossy enamel. Walls in bad condition are enamelled as for new work. Distempered walls to be converted to the modern flat enamel finish can be treated as for new work, but finished with undercoating and a final coat of flat enamel.

Application of Enamel to Metal

Exterior ironwork should be cleaned of rust, given a coat of anti-rust priming, followed by two coats of glossy enamel, flatting the first coat of enamel by sandpapering and dusting prior to applying the final coat of glossy enamel. Bicycles and similar vehicles made of metal are preferably baked or stove enamelled. If they have to be done at home without an enamelling oven, treat them as for exterior work, taking care to clean thoroughly every part before commencing the work. Special enamels are sold for this work.



Enamel. Fig. 1. Applying putty to all holes and cracks.

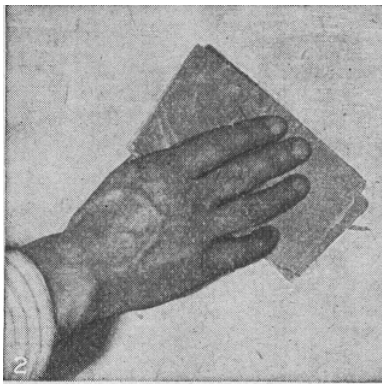


Fig. 2. Sand-papering lightly to produce a level surface.

Fig. 3. Applying the undercoating.

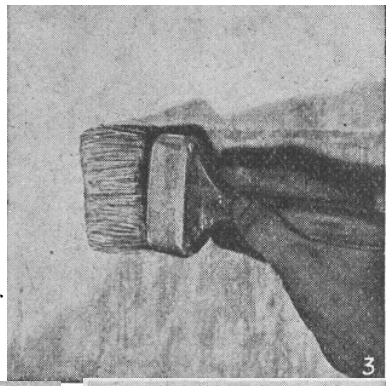
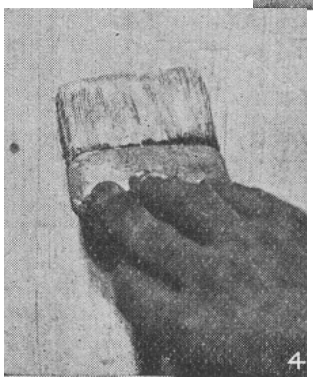


Fig. 4. Laying off vertically.



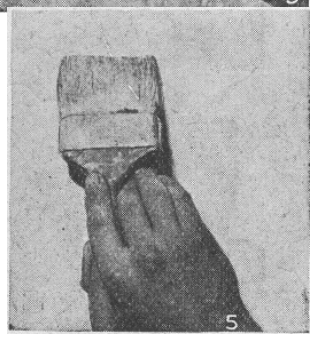
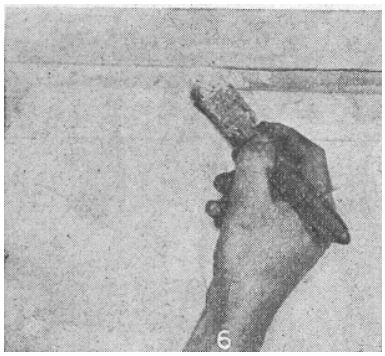


Fig. 5. Flowing on the enamel; note grip on brush and absence of brush marks.

Fig. 6. Cutting-in edge of moulding.



The illustrations show the right and wrong ways of manipulating the brush. A useful type is a flat bristle brush ready ground, or worn in by previous use, cleaned and washed. When using proprietary enamels always use undercoatings made by the same manu-facturers. Do not add anything to the enamel; simply stir it and apply it in broad, generous strokes of the brush. Do not apply too much enamel, or it will run and show ridges, nor must it be brushed out too thin, or bare places will appear, with unequal gloss. The thing to bear in mind is that a good coat of enamel should be of equal thickness everywhere on the enamelled surface, and just as thick as it can be

without sliding downwards. When enamelling a room do the prominent parts, like the door, cupboards, and windows, first, and finish with the skirting. Begin with the panels of a door; then do the muntins, top, middle and bottom rails or cross-pieces, and finally the stiles.

Enamel sets very quickly, and in half an hour from application it cannot be touched up without showing. Endeavour to apply the enamel so that the finished work is always behind the brush. Thus in covering a large area work up and down or across from side to side, so keeping the edge of the enamel always alive or workable. In dealing with windows, cut in all the small rails first, and then finish on the broad areas.

Enamelling a Bath. To cleanse the bath scrub it with hot water and soap extract. This will usually remove all the grease and dirt, but should these be obstinate the application of some gritty scouring powder may be necessary. When the scrubbing has been completed, two or three good scourings with cold water should follow. The next step is to wipe the bath dry and to smooth the surface by rubbing with glass paper of medium texture. Special care should be taken to rub down the parts around the exit pipe and wherever the old paint has been chipped away from the surface.

The bath must then be allowed to dry thoroughly. From now onwards until the last coat of enamel has dried no water mist be permitted to fall into the bath. It is well to tie up the taps so that they cannot be turned on. Also, as taps often drip, it is a good plan to suspend an old empty paint can under each tap, or to stop the mouths with a cork. Just prior to the application of the first coat, the bath must be wiped free of dust and grit. If smuts have blown in from an open window, it may be advisable to rub them off with a rag dipped in turpentine.

Many good enamels are specially sold for bath work. The one selected should be purchased in two grades; (a) to dry with a matt or dull surface, and (b) to dry glossy. Twice as much of (a) is needed as of (b).

The first and second coats should be made with the dull-drying medium. They should be applied sparingly. Do not try to hide all the marks of discoloration with the first coat. The aim should be to obliterate a little of the discoloration as each coat goes on until none is left when the final painting has been carried out. If a non-glossy enamel be used for the two preliminary coats, each will be dry after the lapse of two days, and then the glossy enamel may be applied; this should be left for a week. As paint hardens quicker in dry weather, it is best to do the work in spring or summer. If on placing the hand firmly on the new surface there is the slightest disposition to adhere, it may be considered as still insufficiently hard.

When, however, the paint is dry, the bath should be filled with cold water, the plug should then be removed and the hot tap allowed to run. In this way, the cold water should gradually give place to warm and then hot water. The latter should be allowed to remain overnight, when the job may be considered at an end. If the plug be made of metal, it will be advisable to replace it with a rubber one, so that it will not chip the new surface.

Cellulose Finishes. Cellulose enamels are on an entirely different basis from oil paints, and thus possess different properties. In the manufacture nitrocellulose is dissolved in specially prepared solvents to which plasticisers, gums and resins are added. Special pigments are incorporated to give the desired colours and tints. The drying takes place by evaporation of the liquid solvent content, and the action is very rapid.

In their first stages of development cellulose enamels were only suitable for application by spray, a method used extensively in industrial work. It has been found possible, however, to produce cellulose finishes which do not dry too rapidly in the early stages to make them impossible to brush. These modified finishes are, in fact, very suitable for application by brush, and the technique differs only slightly from that with oil paints. The products are characterised by many desirable properties such as quick-drying, good gloss and great durability. They are generally suitable both for indoor and outdoor work.

Special Methods for Cellulose Enamels

When using a cellulose enamel stir the paint well up from the bottom and apply with a clean rubber-set brush having soft bristles. The brush should be well charged with the paint and handled so as to distribute it evenly over the surface. The second charge of the brush should be applied at some little distance away from the first and the material laid off towards the previously painted area. By finishing the stroke with the tip of the brush lightly in a wet portion, brush marks and "drags" will be avoided. The material should not be brushed out in the manner of an oil paint, but only sufficiently to give complete and even cover. Only a small area at a time should be covered. At room temperature, the first coat should be left a minimum of 2 hours before the second is applied. The shades are mixed together to obtain any particular colour.

Brushing cellulose enamels can be applied over almost all types of surfaces, but these should, of course, always be clean and dry. All traces of polish, wax, grease and oil should first be removed with turpentine. Rust on metal should be removed by sandpaper and good quality petrol until no trace of it remains. On bare wood, plaster or wallboard a specially made undercoat is usually recommended, as this helps in building up to a good finish.

Such undercoats are usually on an oil base. The undercoat should generally be given a drying period of eight hours or more, before the finishing coat is applied.

Before applying cellulose enamels to finished surfaces these should be sandpapered smooth, and the same applies to all rough places or parts where the old paint film is broken through, when the edges should be "feathered" down. All traces of varnish must be

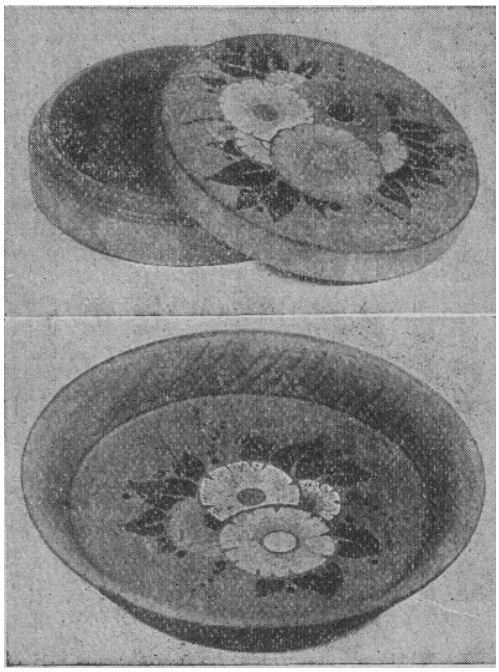
removed. Cellulose enamels should not be brushed over a surface that has been recently painted with varnish or enamel, or lifting may occur. When applied over surfaces which are already painted, the life of the cellulose finish will only be that of the old paint film beneath.

Clear Cellulose Varnishes. These are particularly suitable for use by amateurs on stained furniture, such as sideboards and dining tables, where french polish would ordinarily be employed. It is necessary to remove every trace of grease or wax polish from the surface before the clear cellulose is applied. The varnishes are not intended to be employed over a cellulose enamel to increase the gloss, as a better method is to rub the surface with a cloth moistened with a little polish supplied by the manufacturer of the enamel. An occasional rub over with this polish will ensure that the gloss is retained. Clear cellulose varnishes are only suitable for indoor work.

The solvents in cellulose finishes are inflammable, and the material should not be used near a fire or any open flame. It can be used on geysers and fireplaces without fear so long as no flame is present while the material is being applied, or within a few hours after application. When used indoors the room should be well ventilated.

ENAMEL: Flower Designs on Wood.

A modern note for small articles is struck by staining white wood brown or grey and using enamels only to paint the decorative pattern than by doing all the work in the latter material. White wood door plates, trays, blotters, boxes and book ends can be quickly transformed into charming sets by this means. The contrast of the matt background and shining flowers is attractive.

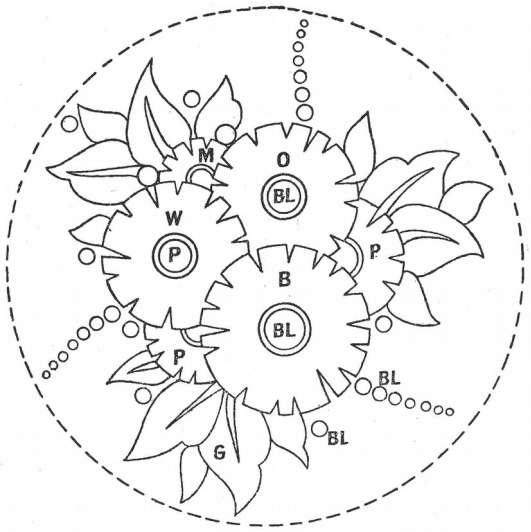


Enamel: Trinket box in stained grey wood with flower design in brightly coloured enamels. See key diagram.



Enamel: Powder jar in stained grey wood with flower design in brightly coloured enamels. See key diagram.

The set of powder jar (or it would do equally well for Cigarettes), trinket box and pin tray here illustrated could be stained grey, using a water stain that is obtainable in small bottles. The surface of each white wood article is first rubbed down with a piece of glass paper and then, having diluted the stain to about half its strength with water, each piece is painted. When dry the stain is rubbed down with glass paper and polished with a stiff brush in order to give a satisfactory surface on which to enamel the pattern.



Enamel Design and key to colours on the lid of the trinket box illustrated below B, pale blue shaded with dark. 0 orange and pink. W white and yellow. P pink. M. mauve. BL, black. G, dark and light green.

The chosen design is traced on tracing paper and transferred to each article, using red carbon paper, a small piece of which is placed between the design and the wooden surface. Take care not to dent the wood.

The colours are then filled in according to the chart, using small tins of enamel supplied from an arts and crafts department or studio. Outfits of 10 colours can be obtained for 4s. 6d. with medium. A boxwood stick is used to apply the enamel in a circular motion, spreading it evenly over the surface; where one part of the design intersects another, allow the underneath part to dry before colouring the rest. For example, on the pin tray the leaves are done first, then the two half-

open flowers are coloured, then the white one and last the blue, allowing each part of the design to dry in turn. The design on the trinket box only is outlined in the diagram above, but this is reproduced in actual size and can be easily adapted to suit the several pieces.

ENAMELLING AS A DECORATIVE ART

Methods of Using Fired and Cold Enamels

Having told how a pendant and a cigarette box can be decorated by fired enamel, this article goes on to describe the use of non-firing enamels, with designs for a trinket box in imitation cloisonné.

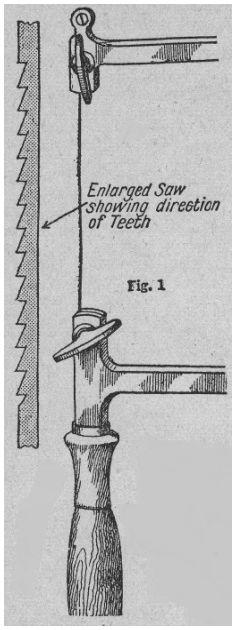
In most cases enamelling is used in conjunction with metalwork. In cloisonné enamels, for instance, it is inseparable, fine wires being first soldered to a base. The muffle furnace is of great importance to the enameller. This can be heated by gas or electricity. For quite small articles the jeweller's enamelling furnace shown in the photograph on page 766 could be employed. It is worked with a draught burner and does not require air blast. The following tools are needed: a small bench, a pair of furnace tongs, a porcelain pestle and mortar, a pair of small shears, an etching point, or scriber, and a set of enameller's saucers.

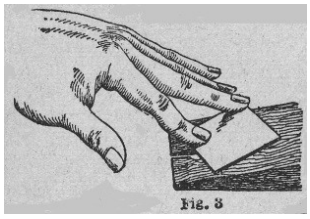
The other requirements are a palette knife, 6 assorted needle files, 1 half-round file (smooth), 1 flat file, safe-edge, super fine; 2 pairs of small pliers (1 snipe-nosed, 1 flat-nosed), 1 flat steel stake, 1 small planishing hammer and handle, 1 wooden mallet, a small saw frame and saws (No. 0 or 00), an upright drill stock and small drills, a wire brush, acid bowl, and a small vice.

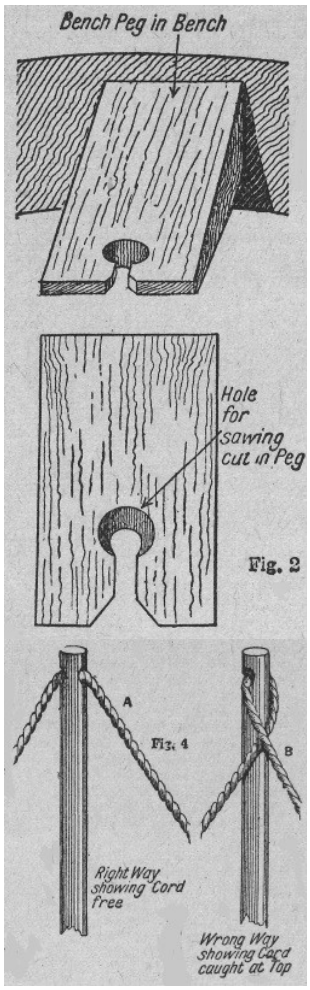
Enamel Pendant. A simple pendant would form an easy job for the beginner. The design having been chosen, the following materials will be needed: A piece of fine silver sheet, gauge 10, size 2 ½ in. by 2 ½ in. Fine silver, i.e. unalloyed, should always be used for best colour results, as standard silver, i.e. alloyed,, blackens when heated and dulls the enamel. Besides this there are required a sheet of silver foil, gold shell, 1 oz. gum tragacanth, a small bottle of pure sulphuric acid, and a piece of standard silver wire.

Take the piece of silver and trace upon it the shape of the pendant. Carbon paper will give a good impression on the metal. Then, with the scriber, or etching point, engrave the traced line, so that it is plainly seen when the carbon rubs away. The next operation is to saw round the engraved line.

Fix a saw in the saw frame, being careful that the teeth are pointing outwards and downwards towards the handle. Screw up, so that the saw is absolutely taut (Fig. 1). Saw a small hole in the bench peg, the small projecting part of the bench (Fig. 2). Place the silver on the peg, just above the hole. Hold it firmly with the first and second fingers of the left hand. Place the saw in the hole against the edge of the silver, moving it up and down in even strokes. It is the down stroke that cuts, and must, therefore, have slightly more pressure. Keep the saw perpendicular. When coming round a curve, move the metal gradually round, not the saw. See that it is kept flat all the time (Fig. 3). If it is allowed to tip up it may break the saw.







Enamelling. Fig. 1. Saw frame. Fig. 2. Bench peg. Fig. 3. How metal should lie flat on peg. Fig. 4. Right and wrong ways of twisting cord for drilling.

Drilling the hole for the insertion of the ring needs a little practice. Place the drill in the chuck. Keep the drill-stock perpendicular placing two fingers on the cross-bar. See that the cord is not caught at the top (Fig 4). Revolve the spindle until the cord is twisted down it. Very gently press the cross-bar down, and it will come up again without a second movement (Fig. 5). When spinning, no further pressure is necessary. The metal must now be annealed or softened. If the bench is not fitted with a burner for the blow pipe, the furnace can be used.

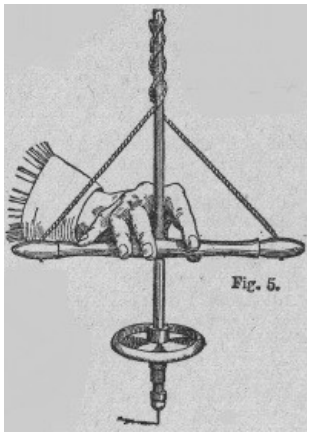


Fig. 5. Drilling. Note twist of cord.

Having in the first instance obtained a good heat in the muffle, put the silver on the firing plate. With the furnace tongs place it in the muffle for a few seconds until the silver reaches red-heat. Great care must be taken to withdraw it immediately, as it will melt if left longer. The silver may be plunged into water to cool. It will now be soft and pliable, and is ready for doming. Holding the silver by the edges, place it on the steel stake and tap it with the planishing hammer, making even pits in circles until it becomes the required dome (Fig 6). Should the metal become stiff and springy, the annealing process must be repeated. Enamel applied to flat metal draws up, cracks, and flakes off. Hence the reason for doming.

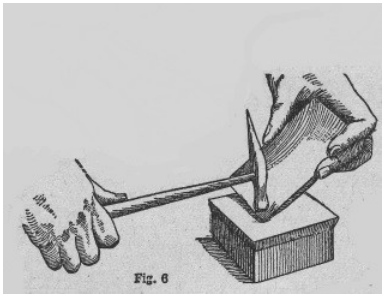


Fig. 6. Doming the silver.

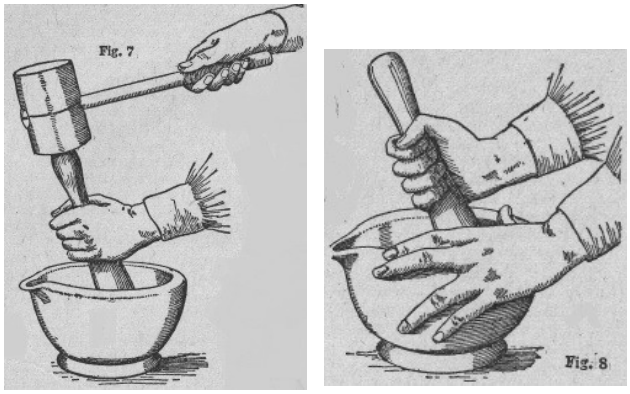
The pendant is now ready for cleaning. The presence of any grease or discoloration may ruin a colour; therefore too much attention cannot be given to the following: Pickle is the technical name given to the weak solution of acid used for cleaning metals.

Particular care must be taken in the mixing, and these instructions faithfully followed, or a serious accident may result. The quantities are one part sulphuric acid (vitriol) to 20 parts water (about 10 fluid oz. of water to ½oz. of acid). Always pour the water into the bowl first; then add the sulphuric acid gently, a few drops at a time, covering the entire surface of the water.

Even so, the bowl will be found warm to the touch. Should this process be reversed, or the acid poured in quickly or carelessly, the sudden mixing would create heat enough to cause an explosion.

After leaving it a few seconds the pickle is ready for use. Place the bowl upon a gas ring with a small flame. Put the silver in, and heat until it is just on the boil. Remove the silver from the bowl with a match-end or piece of wood. It is not advisable to put the hands in the pickle more than is necessary. Never use iron tweezers. Iron in pickle leaves a pink deposit on the silver. Next take the silver to a tap, and with the wire brush, under running water, brush the surface briskly. When back and front are absolutely bright and free from grease it is ready for the enamel.

The grinding must now be done. Clean the mortar thoroughly. In it place, with a little clean water, a small piece of enamel of the desired colour. Experience only will teach the amount necessary to cover a surface. Take the pestle, which must also be cleaned, and tap it gently with the wooden mallet, reducing the enamel to small flakes (Fig. 7). Then grind with the pestle until it becomes a fine, even powder (Fig. 8). The water will now be milky. This milkiness must be washed away under running water until the water is perfectly clear. Care must be taken not to wash the enamel away. This can be avoided by giving it time to sink at each rinsing. Put the enamel in one of the saucers with a little water, and cover it with the lid. Repeat this operation with each colour that is required.

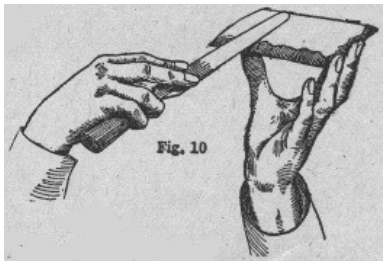


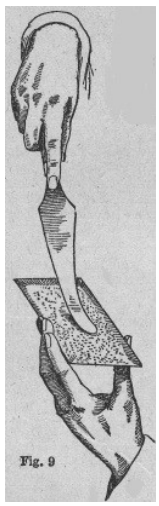
Figs. 7 and 8. Grinding the enamel.

Where a thin metal is employed, a counter-enamel will have to be used. This means that the back is covered with enamel. It is done to prevent cracking, as the metal and enamel contract at different rates during cooling. Take two flakes of gum tragacanth and soak in a saucer with water. When the liquid is sticky to the touch, cover the back of the pendant with it, using a clean sable paint brush. The pendant or piece of silver to be dealt with should be held on the tips of the fingers by the edges, back upwards, to avoid marks on the silver.

This having been done, the next step is to take a small spatula or penknife, and with it convey the enamel to the back (Fig. 9). Tap the edges gently to disperse it over the surface. Then smooth it over, using a slight pressure until the whole surface is evenly and thoroughly covered. Care should be taken that the enamel is not too thick. The moisture should be soaked up with clean, white blotting paper or linen rag. To apply the enamel to the front the pendant must be turned, but still held in the same way. The colours must be blended and shaded as required, but no gum tragacanth is necessary on this side of the article. The surface should then be smoothed over with a palette knife (Fig 10), and the moisture absorbed by the method just explained.

Fig. 9. Pressing down counter-enamel.
Fig. 10. Smoothing surface of enamel.





The firing plate (Fig. 11) is now required. This is made of nickel-sheet, and must be cut in such a way as to clear the sides of the muffle, and short enough to allow the door to close. Turn the end up, so as to give a grip for the tongs. The muffle should now be an even cherry red, with no dull black spots. This is essential for good results. Place the enamel on the firing plate, lifting it carefully with a palette knife. Remove the door from the muffle and rest the plate in front and leave it there (Fig. 12). When all traces of moisture have evaporated it is ready for firing. At this stage the powdered enamel is dry and easily shaken off, so care must be taken in placing in the muffle (Fig. 13).

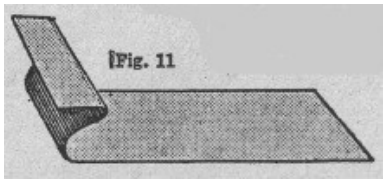
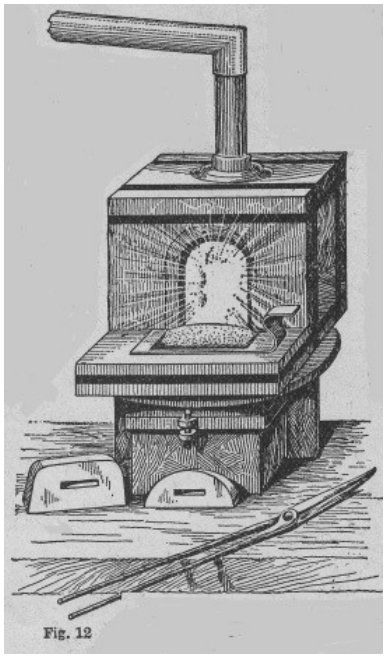


Fig. 11. Nickel firing plate on which enamel is carried.



Enamelling. Fig. 12. Firing plate with enamel placed in front of muffle to allow moisture to evaporate.

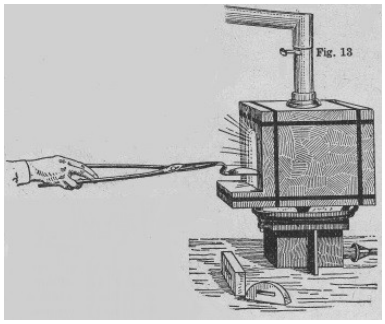
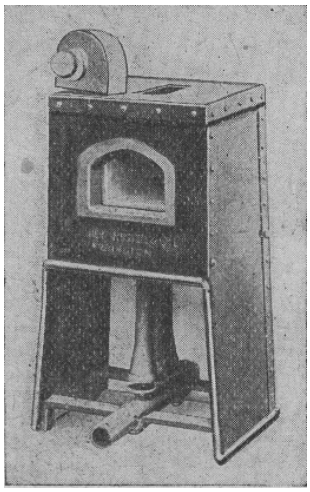


Fig. 13. Placing plate into muffle for firing.

The difference in the melting points of various colours make it impossible to say exactly how long an enamel should remain in the muffle. The enameller must watch carefully and see the changing as the enamel melts. It is not good to have the door out all the time, as it chills the muffle. When the enamel is nearing the molten state, hold the tongs over it, and when they are reflected in it, the enamel is fired and must be removed quickly. Overfiring is disastrous, and neglect at this stage may easily spoil the pendant or other object being fired. Do not remove the pendant or other object from the plate, but put it near the muffle to cool gradually. The enamel has now had its first firing. It may happen that there are holes in the surface, or that part of the counter-enamel has dropped off. This must be patched when cold, and refired before proceeding.

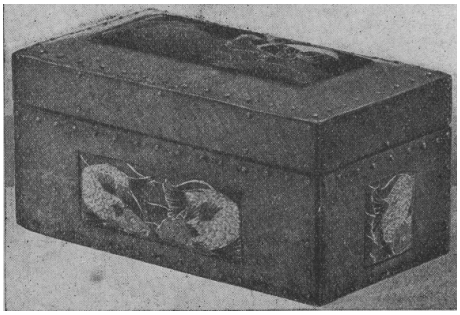


Enamelling. Small gas furnace which can be worked with a draught burner, and does not require air blast.

Silver and gold foils are used for still brighter effects. In this pendant, silver, foil might underlie the small spots of the design to give a jewelled appearance. Take the sheet of silver foil and, holding it between the packing papers, cut small circles to the number re-quired. These are applied to the surface of the enamel by means of a spot of gum tragacanth solution, Fire again, but this time it is only necessary to reach red heat. When cold, cover the foil with spots of enamel. A small sable brush is best for this purpose. Spots of white or other light colour are also done in this operation. Again only a slight firing is given, so that these spots are glazed but do not sink to the surface level. There remains the heightening of salient features of the design with gold. For this take the gold shell and a fine sable brush. Using a little water, paint the design with a strong, clean line, and fire again.

The pendant is now finished except for the jump-ring for hanging. This may be made from a piece of standard silver wire, gauged to slip easily through the hole already drilled.

Cigarette Box. The panels of the cigarette box illustrated in Fig. 14 are simple examples of painted enamel. They are held by means of copper frames applied to a wooden box. In addition to the tools and materials already mentioned, a ground glass slab and glass muller are required, also a small bottle of oil of spike lavender, a bottle of fat oil of turps, and one gramme of iridium black. The plaques are enamelled on copper sheet, gauge 5 or 6.



Enamelling. Fig. 14. Cigarette box in polished copper, riveted on cedar wood, with enamelled designs on inset domed plagues.

Mark off, with the scriber, the five panels (i.e. four for the sides and one for top), seeing that they are parallel and true. They should measure about ¼ in. each way above the actual size when finished. The doming pulls the edges inwards, and thus the design would be hidden under the frame if it were not slightly smaller than the metal. With the shears cut on the etched line and round off the corners with a file. Anneal the metal as indicated in the making of the pendant.

Dome each plaque (Fig. 6). It is important that all the edges and corners lie flat on the bench and do not rock. Next pickle and brush the plaques, making them very bright.

Coloured enamels applied directly on to copper look dark and heavy, therefore the plaques are first covered with a clear crystal enamel., called copper flux. To cover the five plaques, about ½ lb. of copper flux will be required.

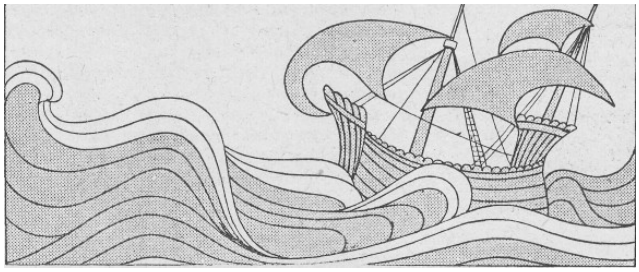
Cover the back and front of the panels, not forgetting the gum tragacanth on the back. Remember to press the counter-enamel down well, and smooth the domed side. Enamel will not find its own level when it is molten, so if care is not taken at this point, a bumpy surface will result. Dry the plaque in front of the muffle and fire it until the flux is quite clear. While it is cooling, trace the design on tracing paper. Place over the plaque a piece of carbon paper and the tracing above it, fixing it down with four drawing pins.

Run over the tracing with a hard pencil to produce a clear carbon line on the flux. Take the ground glass slab and on it put a small quantity of iridium black, one drop of fat oil of turps, and a few drops of oil of spike lavender. Grind together with the muller. With a fine sable brush paint over the carbon line. It must be strong and distinct. If too much oil is used it will be blurred, especially after firing. Evaporate the oil in the front of the muffle, then fire until the line is glazed. The greatest heat is at the back of the muffle, therefore that end of the enamel will be fired first. The enameller must not wait for the other end to fire, but take the plaque out and turn it so that the other end gets the same temperature. This must be observed in every firing to avoid overfiring at one end.

Cut the silver foil into the required shapes between two pieces of paper. Cover the back of the foil with gum tragacanth and place it in position on the plaque, pressing it down firmly. This must also be dried before firing, as if moisture is left under the foil it will bubble. While it is cooling, grind the colours, wash each carefully, and place them in clean saucers. In applying, with an end of a palette knife or pen-knife, care must be taken not to merge one into the other. To avoid this, clean up any enamel which has gone over the outline with a sable brush. Dry and fire as before.

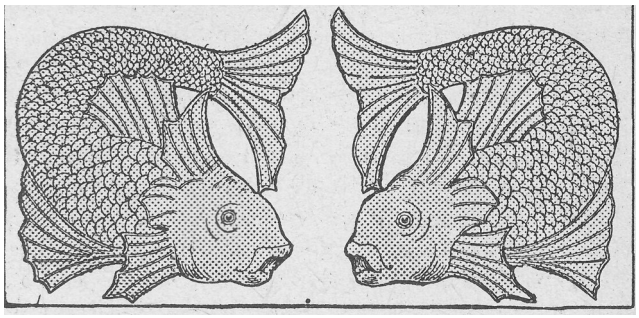
Finishing Touches with Gold Shell

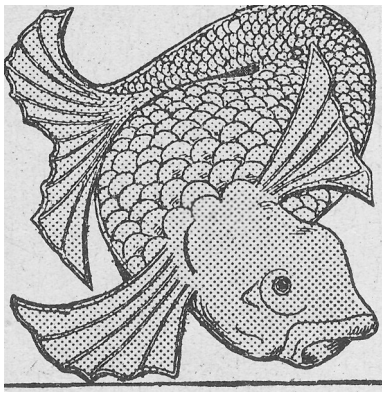
Possibly the work will look blotchy and uneven in colour. Particles may have flown off when it approached the heat, leaving here and there patches of the flux exposed. These must be covered with colour and fired again. When the colour is satisfactory it is worked on with gold shell, which is used in line and dots. Where the drawing needs improvement, e.g. on the rigging of the ship, line work is expressive, and dots are effective on the crest of the waves. After firing the gold, this panel (Fig. 15) is finished. The side and end panels are shown in Figs. 16 and 17. As regards colour and manipulation, they are repetitions of the lid panel just described.



Enamelling. Fig. 15. Design for an enamelled plaque in the lid of a cigarette box.

The numbers of the enamels used in the panels may be useful. They are as follows: sky—blue, 167; Ship—ruby, 115; Sails-yellow, 105; Sea—blue, 136. For the fish, ruby and yellow are employed, the sea being of the same shade (136) as in the top panel. The five panels having been completed, they are applied to the box in the following way. Sheet copper, gauge 10, is used. Cut separate pieces to cover the lid, sides, and end of the box. In the centre of each of the pieces measure the space to be cut for the panel, making it a quarter of an inch smaller each way, so giving it ⅛ in. all round to hold it when fixed. Drill a small hole to insert the saw, and saw along the line, keeping well on the inside. File up the frame until it is true and fits the enamel. Bevel the back to follow the shape of the dome sides.





Figs. 16-17. Designs for side and end panels.

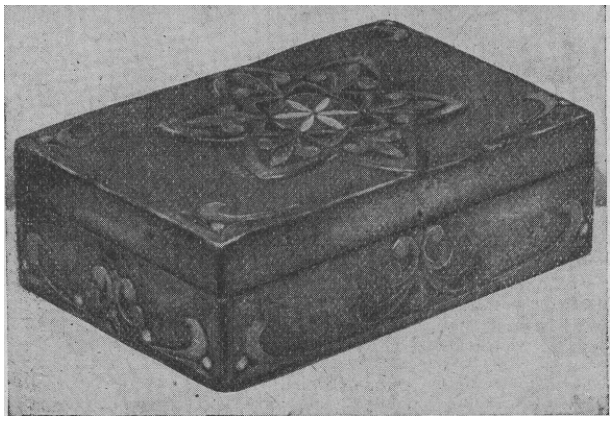
Dome the copper frame, so that while the enamel is held in place the outside edges lie flat on the box. Bevel the edges round the enamel. Measure off the holes and drill, gauging the drill by the diameter of the pins. Fix the frame to the

box with ½ in. copper pins. If the wood is thin the pins must be cut to the required length before being driven. Cover the sides and the ends in the same way.

In cloisonné enamel, fine wires or cloisonnés are soldered to a metal plate. Finely ground enamel is filled in between the wires and fired. The surface is then ground evenly to the height of the cloisonnés. Opaque enamels are usually employed in this type of work. The fish design would be quite suitable for an experimental piece.

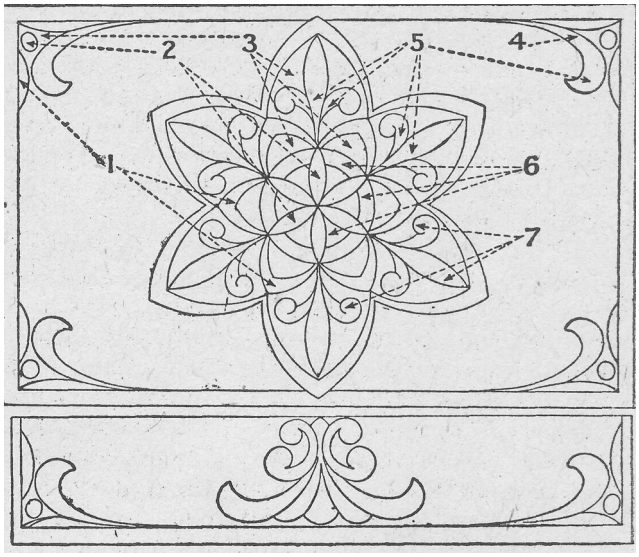
Non-firing Enamel. There is no comparison between the two kinds of enamel, but for many purposes liquid enamel is more practical, and it is much more quickly applied. The materials required are 8 colours in bottles, 1 bottle medium, No. 0, or 00 round sable brush, and 1 small stick with pointed end. Enamel of this kind can be used with equal success on wood, leather, glass, and metal, and its application is a simple matter.

One class of enamelling is an excellent reproduction of cloisonné work, and is not difficult, but accuracy is essential. The design illustrated in Fig. 18, with lid and side shown in outline at Fig. 19, is suitable for a trinket box. Choose a piece of copper 12 in. wide, and measure it on the box. Make a tracing of the design and fit it on the box before tracing it on the metal. Make sure that the design fits the article, and, if necessary, alter it to fit. To trace on the metal, go over the whole of the design with a steel tracer, working from the under side of the metal, and check it to see that nothing has been omitted. Most of this design can be done more accurately with a compass, but, failing this, trace it very carefully. Work on a rubber mat. The raised line thus produced serves to retain the enamel in place and to separate the colours, as in cloisonné work.



Enamelling. Fig. 18. A copper covered box embossed and treated with brilliant coloured enamels. For design see Fig. 19.

Turn the metal over, place on a piece of hardwood, and punch the background, using a large, round-end punch; do not punch too hard, as this buckles up the background. The next thing is to clean the metal. Scrub it well with special powder, using a nail-brush, and dry it thoroughly with a clean rag. Brush on copper patina, using a hard brush. The copper will become almost black. If it does not colour well, or the colour rubs off, it shows that the metal is not clean. Wash it thoroughly and scrub it again, then dry it and apply the patina.



Enamelling, Fig. 19. Design for working liquid enamel without fixing on copper, suitable for lid and side of box.

The metal must be washed again, holding it under a tap, then be hung up to dry, allowing the water to drip off in the same direction as the water from the tap ran over it. When dry, first polish it with a rag, then burnish up the high-lights, using special powder. When the work is polished up well, it must be protected from the action of air, and for this purpose cold lacquer is used. Apply a coat evenly all over the surface, using a soft brush, and leave it until it is thoroughly hardened.

If the top and sides have been worked in one piece of copper, cut the various pieces out. Leave 1/16 in. on the bottom of the sides, and at least ⅛ in. on the end of each side, 1/16 in. being left all round the top. Fit the two short sides first, turning over the 1/16 in., and nail along the bottom of the box. Glue the rest of the metal on to the wood, using metal glue. Fit the back, turning the 1/16 in. over as before, and nailing down, then glue the rest. The front is treated in the same way. The ends of the front and back must be made neat by hammering over the edges of the side pieces.

Round the lid glue slips of copper which have been punched. The top edge can be hammered over the top of the box to about 3/16 in. Fix the top panel over this, get it into its right place and nail it down, using 2/5 copper nails. Prick a hole before inserting the nail, using a metal pricker, then insert the nail and hammer in place, using a nail-driver. This tool is employed so that the marks of the hammerhead do not show on the copper. When the whole of the box has been covered with copper, give it a hard rub with a leather, and it will be ready for enamelling.

Consult the key (Fig. 19) for the colours. Work in the enamels with the small stick sold for the purpose. Work all the colours from the centre to the edge, which is raised, and beyond which the enamel should not go.

(Continued in page 770)

ENAMELLING BY FIRING: DETAILS OF WORK FOR BOX AND PENDANT

Methods of work are described under the heading Enamelling as a Decorative Art.
See page 766



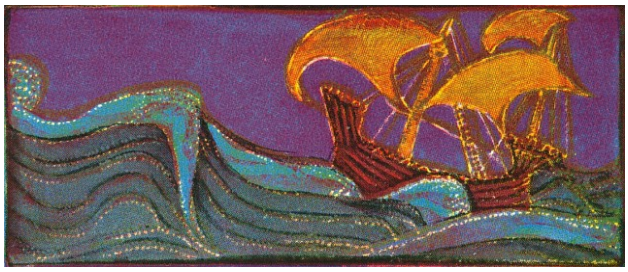
Flux fired on polished copper plaque.



Design in iridium black and silver foil fired on.



Colours fired on.

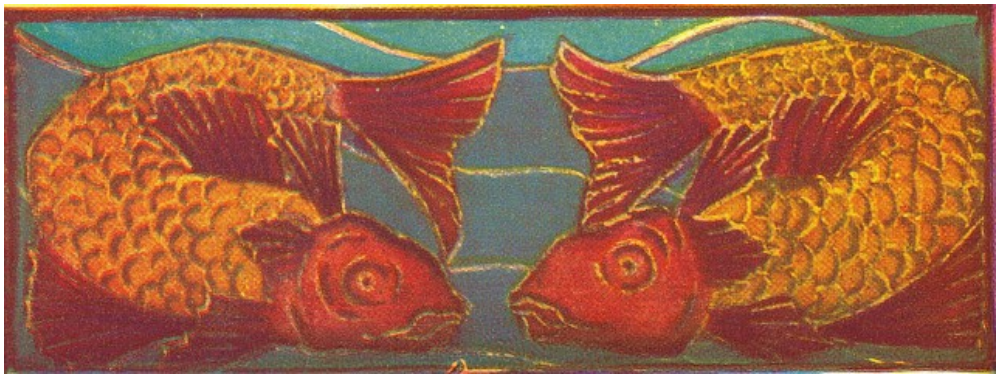


Finished design with gold outlines fired on, making five firings in all.

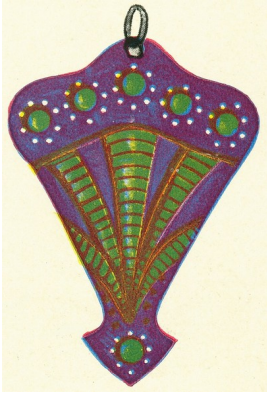


The completed box in polished copper, riveted on cedar wood, with enamelled designs on inset domed plaques.





Front and side pieces in ted and gold.



Pendant in torquoise and green.

See page **766.**

ENAMELLING WITHOUT FIRING: EXAMPLES OF THIS SIMPLE CRAFT

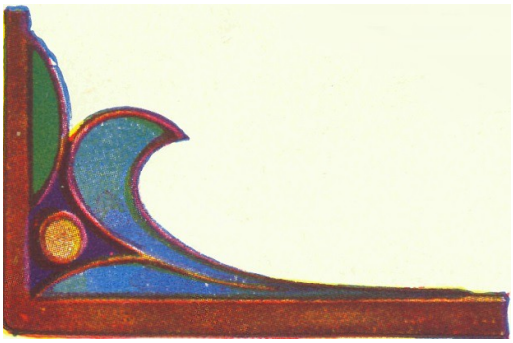
Instructions for this work, as for that in the previous plate, are given under the heading Enamelling as a Decorative Art. See page 766.



Glass bonbonnière decorated with liquid enamel in seven colours.



Lid of glass bonbonnière



Decoration in angles.



Copper covered box embossed and treated with brilliant cold enamels.



Centre ornament, front and back of the box.



Principal ornament on the lid of the box.

See page 766.

Mauve is obtained by mixing a little lapis blue with red. Mix it in a small container made out of a piece of scrap copper. Do not finger the enamel, as the marks of the skin show, and endeavour to work cleanly.

Key to colouring: 1, green; 2, buff; 3, mauve; 4, lapis; 5, cerulean blue; 6, pale mauve; 7, turquoise.

The enamel spreads, so leave it well inside the design, as it does not look well if the colours join up. In all enamel designs there is a division left between the different parts, so following out the idea of cloisonné, where the outlines are formed by the wire divisions, When the brushes are finished with they can be cleaned with methylated spirit. The bottles should be corked well when they are put away, and the liquid stirred before it is used. If the colours become thick, pour a little of the special medium into the bottle and stir it thoroughly.

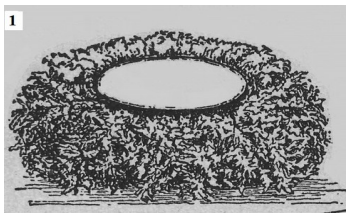
ENCEPHALITIS. Inflammation of the brain substance, especially of the grey matter, which is known as encephalitis, may be due to an injury to the skull, to inflammation extending from disease of the skull bones, as in middle-ear diseases, when an abscess is likely to result, or may be due to poisoning, as in acute alcoholism. It often accompanies meningitis, and may also occur as a separate disease, which is commonest in young children, although occasionally adults are affected by it. Encephalitis is said to be microbic in origin.

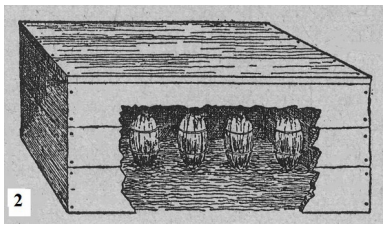
In children it may follow measles, scarlet fever, pneumonia, and other infectious diseases, but more frequently the previous health has been good. The onset may be marked by drowsiness and irritability, and perhaps vomiting. Then convulsions ensue, the child going from one fit into another. The temperature rises perhaps to as high as 105°. The convulsions cease and are succeeded by deep unconsciousness or coma, which lasts for a variable time. When the patient begins to wake up it may be noticed that there is paralysis of one side of the body and face. This, after lasting for some weeks, may gradually disappear, while in other cases a certain amount may be permanent. Mental enfeeblement may also result.

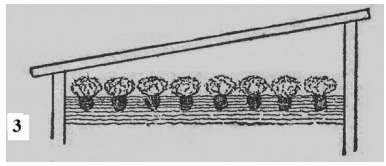
Encephalitis lethargica, popularly known as sleepy sickness, is also a disease due to a microbe and is infectious, though apparently not strongly so. It is likely that some people are carriers of the disease. It is characterised by persistent drowsiness, the patient always dropping off to sleep, from which however he may be roused to answer questions. Squint is common, and a notable symptom sometimes present is persistent hiccough.

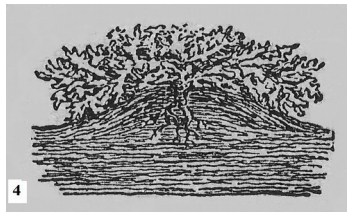
If the patient recovers he may do so completely. On the other hand there may be serious sequelae. Frequently this state resembles that of the disease known as Parkinson's, or paralysis agitans. In other cases there is a tendency to jerky movements suggestive of St. Vitus's dance. Still other cases exhibit mental and moral defects, such as lying, uncleanliness, etc. The disease which may occur at any age, is notifiable, and in any form requires the prompt attendance of a doctor. Pron. En-sef-a-li'tis.

ENDIVE. This salad plant is of value in late summer, autumn and winter. The chief sowings are made in June, July and August. Seeds sown in June and July will furnish endive in autumn, and an August sowing will provide winter supplies. The rows should be 15 inches apart and the seedlings thinned to 12 inches from each other. If the superfluous seedlings are planted on a fresh site they will provide a later supply than those that are left to grow where sown. Seedlings raised in August should be planted in a frame or cloche in October to ensure winter produce. Endive needs well manured and deeply dug soil, which must be kept moist in hot, dry weather.







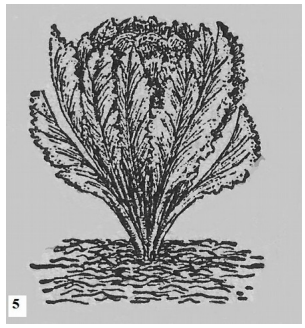


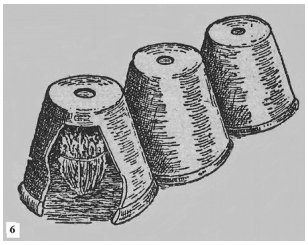
Endive. 1. Blanching under plate.

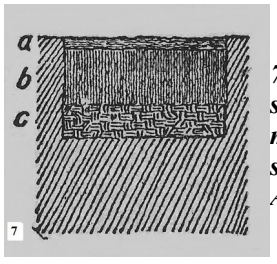
2. Blanching under box.

3. Plants in frame during winter.

4. Planting on ridges.







5. Batavian endive.

6. Blanching under pots.

7. Soil preparation: a fine soil; b soil enriched with manure; c moisture-retain-ing rubbish. (By special arrangement with Amateur Gardening)

The blanching process, which is essential to the production of succulent endive, takes about 4 weeks, and should be started when the plants have well developed centres. A simple method is to cover each plant with an inverted flower pot and to obscure all light by covering the hole in the pot. Plates or tiles may be used. Blanching can also be carried out by tying the leaves together to exclude light from the middle of the plants. The round-leaf varieties of the Batavian endive are excellent, and the various forms of the moss at curled endive are also to be recommended.

Cooking. Although principally used in salad-making, endive may also be cooked like any other green vegetable. When it is boiled, the water should be changed twice so that the natural bitterness of the plant will be reduced, and when tender, the leaves should be put into cold water, left for several minutes, and then squeezed dry. Endive cooked in this way may then be chopped and served like spinach. After a preliminary boiling in slightly salted water, endive heads may be stewed in a pan containing a small lump of butter, seasoning to taste, and a little cream. *See* Salad.

ENDIVE: Use on Furniture. This decoration found on certain pieces of furniture is modelled on the curled leaves of the endive. It is used on Louis XV rococo decoration, and was utilized by Chippendale in his renderings of French detail.

Endocarditis. *See* Heart.

ENEMA: Its Uses. An enema is an injection of fluid into the rectum or lower bowel and is also resorted to in supplying nourishment to the body when this cannot be given in the ordinary way.

An enema for constipation may consist of water alone or with soapsuds, olive oil, castor oil, turpentine, etc. A soapy-water enema is made by pouring a pint of boiling water over 1 oz. of soft soap and stirring well till the soap is dissolved. It is allowed to cool sufficiently. Two tablespoonfuls of castor oil, 6 oz. of olive oil, or a tablespoonful of rectified oil of turpentine may be made up to a pint with warm soapy water; or ½ to 1 oz. of Epsom salts may be dissolved in the same quantity of warm water. Instead of giving a large watery enema glycerin may be used and 2 or 3 teaspoonfuls will probably suffice. In obstinate cases the injection of ½ to 1 pint of warm olive oil will be helpful.

The enema may be administered by an ordinary douche bag or can, to which is attached a couple of yards of narrow tubing ending in a vulcanite nozzle which should be smeared with vaseline. The patient is placed on the side with the thighs bent up on the abdomen. When the bag and tube have been filled with the fluid, the nozzle should be gently inserted into the rectum. The bag should then be slowly elevated some two feet above the patient, so that the fluid may flow in. An enema may also be given by using a Higginson syringe, a rubber tube with a bulb in the middle.

ENGAGEMENT. An engagement or betrothal is the formal recognition of the fact that a man and woman intend to marry. The period lasts from then until the wedding day. Almost invariably the man gives to his fiancée, as the lady is called, a ring known as the engagement ring, and sometimes one is given by her in return. Sometimes a public announcement of the engagement is made through the newspapers.

If the parents of the two are unknown to each other, steps are usually taken to bring them together. Sometimes the engagement is celebrated by a dinner party or other social function. An engagement is regarded in English law as a contract, and if either party breaks it an action for breach of promise of marriage can be begun. *See* Agreement; Breach of Promise; Marriage; Ring; Wedding.

ENGINES AND BOILERS FOR THE MODEL MAKER

Small Power Plants Constructed with Simple Tools

Useful hints are here given on the care and running of model steam plants. Reference should be made to the associated articles Boat; Electric Motor; Locomotive; Railway.

Most model steam engines function on one of two principles, either with the simple oscillating cylinder or with a double-action slide-valve cylinder. In the former case the cylinder itself turns about the pivot pin, and as the end of the cylinder moves from side to side, so it automatically covers and uncovers the steam port.

The steam enters the first port, forces the piston down to the bottom of its stroke, by which time the cylinder has moved over and closed the steam port, and as the piston ascends the cylinder it uncovers the exhaust port and allows the steam to escape. A small spring and adjusting nut are fitted to the pivot pin to keep the cylinder and valve face in contact.

The double-action cylinder is a fixture, and is provided with a slide valve, like a miniature box without a lid; this moves up and down by the action of the eccentric, and alternately covers and uncovers the steam ports, admitting steam first to one end of the cylinder and then to the other. At the same time it connects the steam passage in the cylinder with the exhaust port, which communicates with the exhaust pipe, and allows the used steam to escape to the open air.

Timing the Valve. For anything more than a toy, this type of cylinder should be adopted. An important item is the correct timing of the valve; this is accomplished by first setting the crank at its dead centre, that is, at the end of its stroke, with the piston almost touching the end or cover of the cylinder. The eccentric is set at right angles to the crank; when in this position the valve should cover both steam ports. The eccentric is slightly advanced or rotated until one

of the steam ports is just about to be uncovered. Steam is therefore admitted to the back of the piston, and the engine will function correctly. This principle is applied to model locomotives, and many other types of steam engines, but in various sizes and proportions according to the models.

All small steam engines should have regular attention in the way of lubrication and cleaning. The boiler should not be left standing after a run, but emptied of water; any surplus spirit should be emptied from the container, the body of the machine wiped dry with a cloth and all working parts lubricated. The safety valve requires to be inspected from time to time. All methylated spirit should be kept securely corked up in a can, and away from the engine. The container must be wiped dry on every occasion when it is filled.

The water in the boiler should never be allowed to get too low. Its level can be seen in the water-gauge glass, but as a rule the spirit lamp will burn out before the boiler water is all boiled away. When the spirit lamp is refilled the boiler should always be replenished at the same time. Should the pressure of steam rise to an alarming extent, turn on steam to the engine and run it at full speed; also either remove the spirit lamp or else blow it out.

Simple Steam Engine. The diagrams given in Fig. 1 show the parts needed for the construction of a small horizontal boiler with oscillating engine, together with a suitable lamp. It is suitable for driving a model boat, but by arranging the boiler and engine in a different manner, and making the other parts to suit, they can be adapted to drive a toy steam locomotive of the simple type shown in Fig. 2. In this model the boiler casing is made from tin, the cylinder is disposed between the main frames, and drives the wheels through simple spur gears. The boiler can be made from thin brass tubing, closed with brass ends that must he securely soldered.

The cylinder can be purchased ready for use from most of the dealers in model engine supplies, and a simple form of standard may readily be made from sheet metal. The valve face of the cylinder is soldered to the standard, and holes are made in the latter for pivot pin and main bearing. The crank is bent up to shape from a piece of steel wire. Wheels for the toy locomotive can be bought from the model shops, where also a suitable flywheel can be obtained. The locomotive wheels are simply driven on to their axles, remembering to fix tho gearwheel before putting the second wheel on to the axle. By setting the boiler in a vertical position and making a circular spirit lamp, these parts can be converted into a vertical engine.

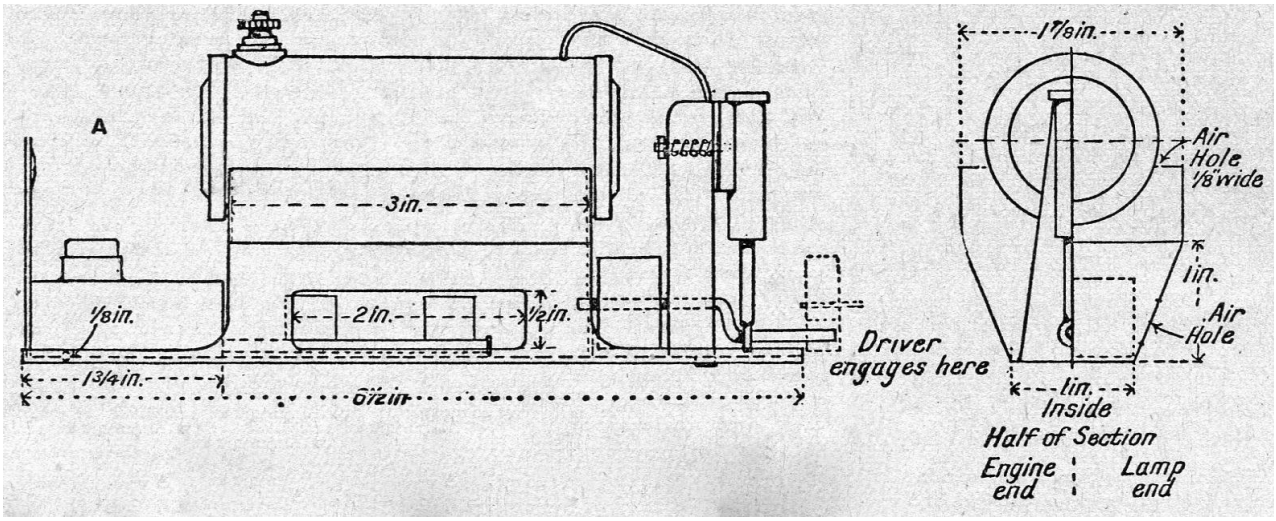
Fig. 3 shows a robust double-acting oscillating engine suitable for a small boat, or for running Meccano models or similar toys. It is larger and more powerful than the simple type just described, the bore and stroke being 7/16 in. The set of parts is sold by the makers, Stuart Turner, Ltd., Henley-on-Thames, at a trifling cost, and the engine may be built quite easily by the least experienced beginner. Cylinder and standard are of gun metal, the crankshaft, disk and crank-pin being in one piece of steel. The boiler illustrated, which has a working pressure of 20 lb., is sold complete with lamp and funnel.

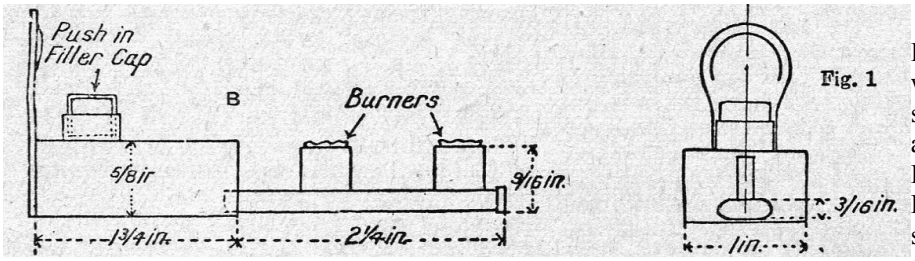
Boilers. A simple horizontal or vertical boiler for a stationary engine is readily made by utilising seamless copper tube of 2½ to 3 in diameter for the barrel, the ends being closed with gun-metal castings or flanged copper disks which just fit inside the barrel. The ends are silver soldered or brazed to the barrel. A casing and firebox of tinplate or other sheet metal may be made for a horizontal type In the case of a central flue upright boiler the lower part of the barrel may serve as a firebox, suitable air holes being made and an opening for the entrance of the lamp-tube and burner. The lower boiler end is fixed inside the barrel at the appropriate height, convex side uppermost, and is bored for the brass tube which serves as the flue. This latter passes up through the top end, and is carefully silver soldered or brazed to both boiler ends. A good boiler for larger stationary engines is the Babcock and Wilcox type shown in Fig. 4. The boiler is made in two sizes, the smaller for engines up to ½ in. bore and 1 in. stroke, the larger for engines up to ¾ in, bore and 1¼ in. stroke. The boiler of the latter is composed of seamless copper tube, 8½ in long and 3 in.
diameter, the ends closed with gun-metal castings silver soldered to the barrel. Through the bottom of the barrel five water tubes, ¼in. in diameter, also of seamless copper, are fitted by silver soldering them to the barrel, one end being lower than the other to ensure rapid circulation. The steam is taken from the top of the boiler, through a screw-down needle valve, inside the boiler casing coiled over the top of the burner to act as a simple type of superheater, and connected to the engines by a union nut.

The casing is made from four iron castings. The castings for the casings, and the gun-metal boiler ends, tubing and fittings, are all supplied by Bassett-Lowke, Ltd., Northampton. The boiler is quiet easily assembled by the amateur. All that is necessary is to drill holes for the fixing screws through each of the end castings, tapping the holes drilled in the side plates, any roughness on the castings being smoothed off with a file. The boiler sits in the circular recess cast in the front plate and rests upon pad pieces on the back plate castings; it is held by set screws through the upper portion of the back plate. The boiler fittings comprise a screw-down steam valve a safety valve, pressure gauge and water gauge, all of which can be purchased with the castings. They are fitted by brazing the bushes, which are supplied with the fittings, into the boiler barrel, and then screwing the fittings into place, seating them on to a thin lead washer. The glands for the water-gauge glass are packed with fine cotton soaked in tallow. The holes for the gauge glass must be directly in line to avoid risk of fracture.

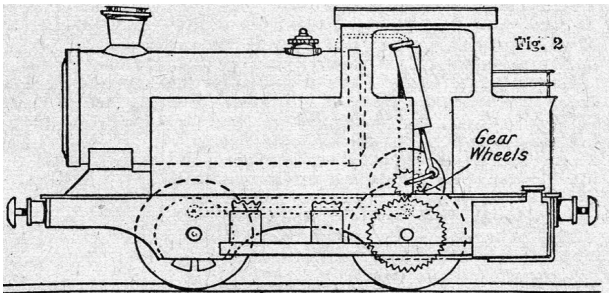
Two separate castings are provided in the shape of a fire door; these fit into holes cored in the front of the

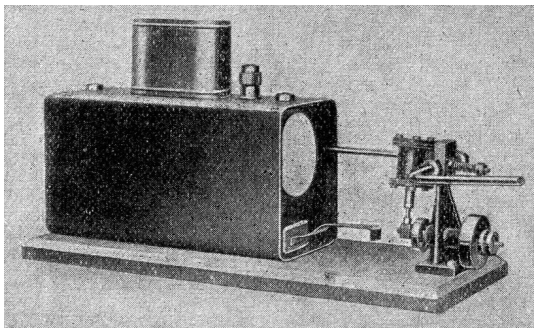
(Continued in page 774)





Engine. Fig. 1 Diagrams of parts which are required to construct a simple engine. A. Side elevation and sections of complete model. B. Details for the spirit burner. Fig. 2. Parts arranged to drive a simple toy locomotive.

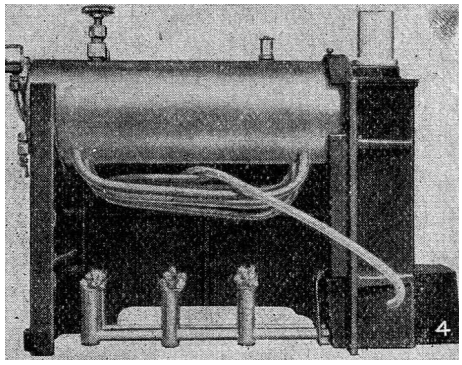




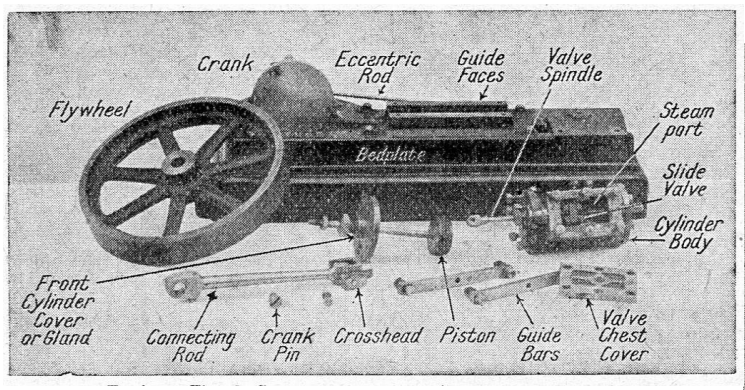
Right. Fig. 3. A useful engine built from parts supplied by Stuart Turner, Ltd., suitable for working small models.

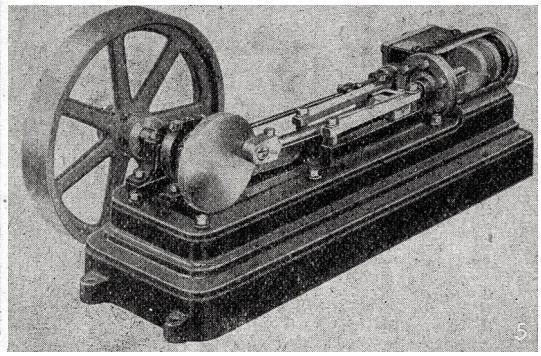
Fig. 4. Babcock & Wilcox type model boiler in part section.

Fig. 5. A Stuart mill engine with cylinder in section.



Below. Fig. 6. Component parts of the Stuart mill engine.





boiler casing, and are held in place by a 3/32 in. diameter steel pin. These are simply pushed into place, meter steel pin. These are simply pushed into place, and may be removed to inspect the flames from the burner. This boiler can be heated by a gas ring or by a vaporising spirit lamp.

The chimney, 7½ in long, is made from stout brass tube 1⅛ in. in diameter, which presses into a hole cored into the top of the smoke stack formed in the back plate casting. The chimney is belled over at the top, and at a distance of ⅝ in. from the bottom is provided with a brass ferrule ¼ in. thick and 1½ in. in diameter. The tube may be polished and lacquered, or painted in any colour. The best finish for the boiler is Brunswick black, and for the castings a brick red to represent brickwork.

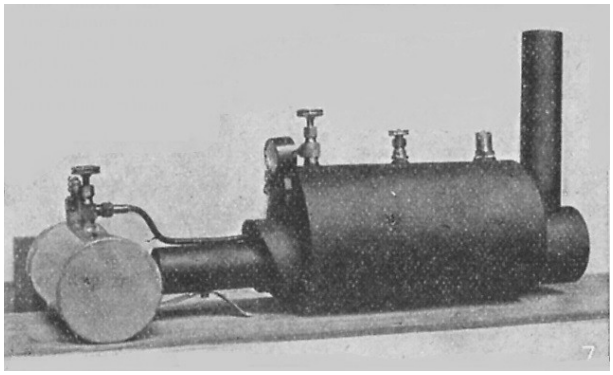
Horizontal Engine. An excellent horizontal steam engine for amateur construction is illustrated in Fig 5, and is known as the Stuart mill engine; the castings and machined parts may be obtained from Stuart Turner, Ltd., Henley-on-Thames, or most model supply shops. It can be purchased in the form of fully machined castings, shown in Fig. 6, thus obviating the necessity for lathe work and enabling the engine to be constructed with the aid of simple hand tools. In Fig. 5 page 768, the cylinder is shown partly sectioned, to illustrate the construction.

The method of erecting this engine consists in taking the bed-plate casting, cleaning up the surface, and lining the crankshaft to the main bearings, remembering to place the eccentric sheave in place before doing so. The flywheel is fitted to the outer end of the crankshaft, and secured with a set screw. The crankshaft has a shouldered screw to act as a crank-pin, which has simply to be passed through the big-end bearing of the connecting rod and screwed in place.

The cylinder, piston, and slide, valve, are assembled and screwed in place with three screws passed through from the underside of the bed-plate casting, care being taken to see that the piston rod is in perfect alinement with the guides. These are composed of two rectangular bars of steel bolted in place, with distance pieces between them and the machined surface of the bed-plate casting. The cross-head has to be tested to see that it slides freely without shake in the guides, any roughness in the casting should be removed with a fine file or by scraping. The little end of the connecting rod should turn freely in the jaws of the crosshead, and is secured with a steel pin. The piston rod screws into the end of the crosshead, and is secured with a lock nut. The piston and glands should be packed with linen thread soaked in tallow to ensure a proper steam-tight sliding fit when the engine is working. The eccentric strap is fitted to the sheave, and the eccentric rod placed in position and secured with a lock nut. The knuckle joint at the end of the valve rod is then screwed in place, and the two connected together by a litle bolt and nut.

The slide valve is timed as described earlier in this article, all bearings carefully lubricated, the remaining bolts and nuts placed in position, and the engine is ready for use. It might be mounted upon a hardwood base and connected to the boiler previously described by fitting the steam pipe to a union screwed to the valve-chest cover, the exhaust pipe being taken to the chimney or disposed of in any convenient manner. This little plant would then drive a number of working models, or even a small-sized dynamo.

Marine Engines. Requirements for the power plant used in a model liner, destroyer, or speed boat are lightness, compactness, economy in steam consumption, and a low centre of gravity. A good boiler is one of the single-flue type (Fig. 7) with a number of water tubes across the flue. Since the flue is surrounded by water no outer casing is needed, and the boiler fits snugly in the hull, the weight being disposed low down.



Engine. Fig. 7. Single flue launch boiler, with blow lamp. (Courtesy of Bassett-Lowke, Ltd.;)

Fig. 8 shows a marine boiler made from sheet copper shaped up and riveted together. This has a dome, from which dry steam is taken off for the engine. In the absence of a dome, the steam pipe is usually made to traverse the flame before going to the engine.

Boilers of the above type are best fired with a paraffin or petrol blow lamp, preferably the former. Special lamps are made for the purpose by the leading model engineering firms (see Fig. 7), but it may be practicable to use one of the tubular commercial lamps made to heat a soldering iron.

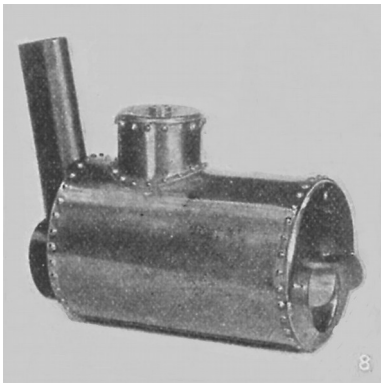
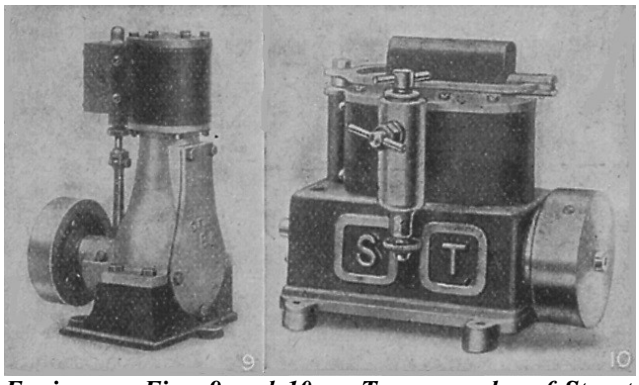


Fig. 8. Another type of marine boiler, made from sheet copper. (Courtesy of Whitneys)

The engine shown in Fig. 9 may be built up from the machined set of castings and parts supplied, with the requisite bolts, nuts and screws, by Stuart Turner, Ltd., already referred to. If the worker anticipates any difficulty in drilling and tapping the

holes, this work will also be done by the manufacturers for an additional charge. The engine is enclosed in an alumi-nium casing, has ball bearings, and weighs, with fly-wheel, 21 oz. Other particulars are: bore ¾ in., stroke ⅝ in. and height from bottom of crank case, 4½ in. The crankshaft is balanced. A displacement lubricator would be a desirable addition.



Engine. Figs. 9 and 10. Two examples of Stuart marine engines which can be built up from sets of machined parts.

Another engine for which a set of machined parts is sold by the above mentioned firm is that, illustrated in Fig. 10. This is an enclosed twin-cylinder engine with ¾ in. bore and ¾ in. stroke. The height is 4 in.; width 3 in.; and overall length 4¾ in. It has a piston valve, and the gear wheels, with other working parts, run in an oil bath. This set is supplied with all holes drilled and tapped. The engine will propel a 4 ft. 6 in. boat.

ENGLISH TERRIER. This lively, intelligent and companionable dog is very similar to the black and tan or Manchester terrier, but his colour is pure white without any markings save his black nose. Any others are blemishes, according to show regulations, though the presence of a spot or two might not be considered as such by the family to which he is attached.

An admirable ratter, he does not always shine as a house guardian, his sense of hearing not being so acute as in other breeds, and often he is distinctly deaf. He has a long, narrow, flat head with fox-like muzzle; small black eyes and upright ears. The tapering tail is carried fairly level with the back. The coat is close, hard and glossy, and the weight from 12-20 lb. The English terrier is rarely seen to-day, having become almost extinct. *See* Dog.

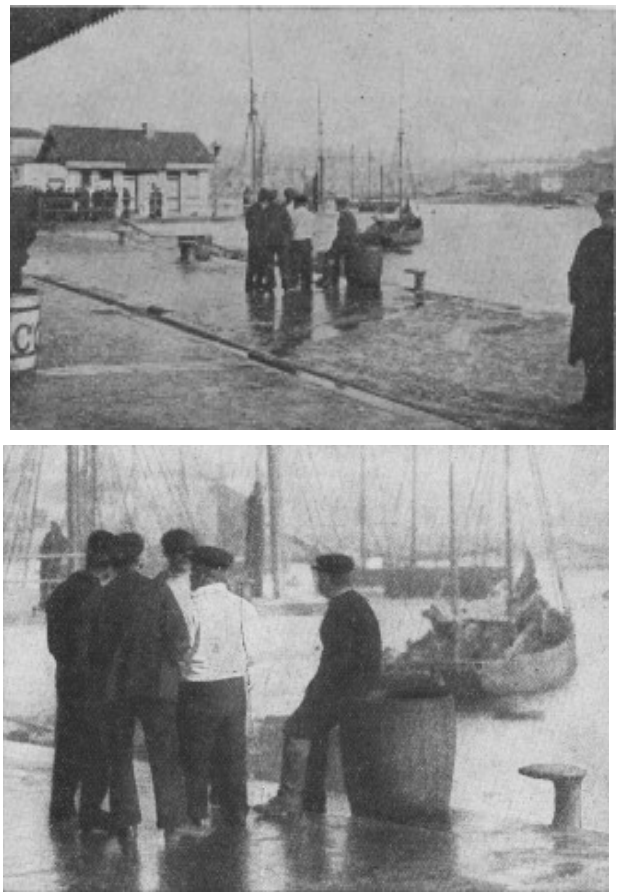
ENLARGING METHODS FOR AMATEURS

How to Make and Use Photographic Enlargers

The following article covers the whole field in a fascinating department of photography, being thus one of a group that includes Developing; Exposure; Photography; Printing.

A properly exposed and developed vest-pocket negative can well be enlarged from 2 ½ in. by 1 ⅝ in. to a really large picture 12 in. by 10 in., or 15 in. by 12 in. With the finest anastigmatic lenses enlargements on much greater scale than this are made.

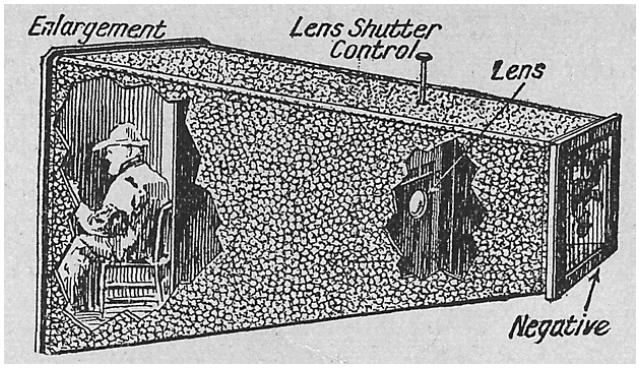
Apart from the obvious use of getting large pictures from small negatives, the amateur will find that he can often greatly improve his photograph in enlarging it by getting rid of unnecessary or disfiguring detail, as seen in the examples in Figs. 1 and 2. The original snapshot (Fig. 1) of a harbour contains much irrelevant detail that destroys the interest of the photograph. By enlarging the centre portion of the photograph (Fig. 2), a really interesting and well-balanced picture is obtained.



Enlarging. Figs. 1 and 2. Above, small snapshot same size as original negative. Below, enlargement of portion of negative showing the greatly improved picture obtained by getting rid of irrelevant detail such as the barrel, roof, and figure cut in half, and useless foreground and uninteresting sky. (Photo by F. J. Mortimer).

Photographs may be enlarged either by the use of daylight or by artificial light, but more reliable results are obtained with artificial light. The simplest form of daylight enlarger is seen in Fig. 3, which consists of a box, small enough at one end to take the negative that is being enlarged, and large enough at the other end to take the sheet of bromide paper on which the enlargement is made. Near the negative end a small lens is placed controlled by the shutter: the focus is fixed, and only one size of enlargement can be made with the particular enlarger. Exposure is made by placing the enlarger out of doors, with the negative towards a clear

sky, the time necessary being found by test. An exposure meter will help in judging times.



Enlarging. Fig. 3. Simplest form of daylight enlarger consisting of a box and a fixed focus lens.

Artificial light enlargers are of different types. They may be grouped in two classes: (a) Those that use large and somewhat expensive condensing lenses, and (b) those that use reflected light in some form. A standard form of condensing enlarger is seen in Fig. 4, where A is the lantern house, B metal collars containing the condenser, which open and close to vary the distance between the light in the lantern house and the condensing lens, the latter being fixed to C, the carrier stage, in which D, the slide carrier holding the negative to be enlarged, is placed. Bellows E, permit the focussing of the lens F. The focussing of both lens and condenser is effected by sprockets and chains, worked by milled headed screws, G. It is necessary to be able to focus the condenser itself, since the more the enlarging lens F is racked out, the shorter must be the distance between the light source and the condensing lens.

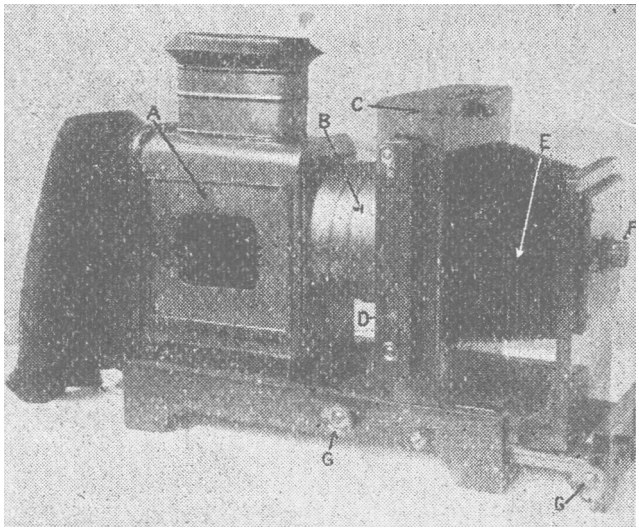


Fig. 4. Standard form of artificial light enlarging lantern with condensing lenses. (Courtesy of Ensign, Ltd.)

With apparatus of this nature it is easy to make enlargements of every size from any negative, the only limitation being the size of condensing lens. The rule is that its diameter must be equal at least to the diagonal of the negative to be enlarged.

In using an enlarging lantern it is essential to see that the light is accurately centred and focussed. This is because the condensing lens only makes use of a point of light from the source of illumination, as will be seen in the diagram, Fig. 5, which shows the complete optical system used in an enlarging lantern. This also illustrates the necessity for accurate centring, for if the line AB does not pass through the centres of the light-condensing and enlarging lenses, it is impossible to get even illumination.

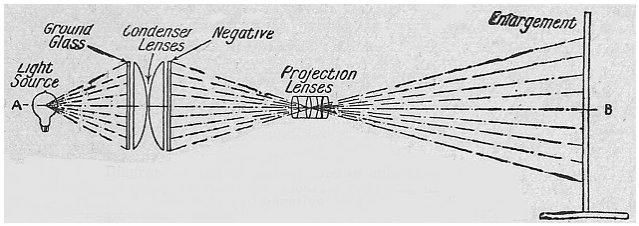
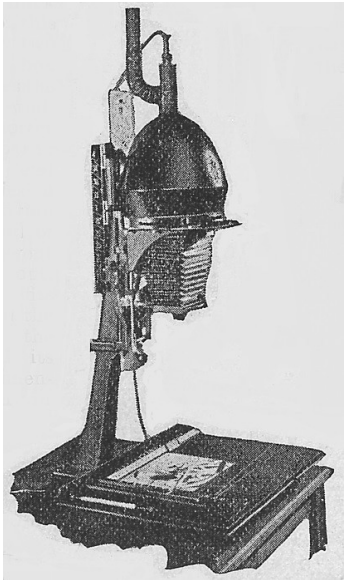


Fig. 5. Diagram of optical system used in enlarging lanterns, showing necessity for accurate focussing of both light and negative.

An enlarging lantern arranged in the vertical position offers distinct advantages. Adjustments are made rapidly, and in some types automatically, while no separate easel or table to take the whole apparatus is required. An efficient form, the Kodak "Auto-focus" enlarger, is illustrated in Fig. 6. The lamp-house contains a reflector with a sheet of opal glass to diffuse the light; below are the negative carrier, the bellows and an anastigmat lens. No condenser is required. A gas-filled lamp of 400 watts is recommended. An automatic focussing device gives a sharp image whatever size enlargement is chosen. The apparatus is designed to be firmly clamped to a table. If a V.P.K. negative be used (2½ in. x 1 ⅝ in.) enlargements up to 8¼ in. x 5¼ in. can be made; the largest negative which the carrier will take permits an enlargement up to 28 in. x 20 in.



Enlarging. Fig. 6. Showing the very efficient Kodak. "Auto-focus" enlarger.

Smaller and less expensive automatic enlargers of this type are also available.

A slightly more elaborate mechanism employing a condenser, the Ensign "Magna-print." is shown in Fig. 7. Its characteristic is the speed with which enlargements are produced, a 1/1 plate enlargement from a ¼ plate negative being prepared in 3 seconds. The focussing is semi-automatic,

the whole instrument moving on the pillar and locking into position for the required degree of enlargement. The maximum is 20 in. x 16 in. from a ¼ plate negative. This enlarger is also available for copying or photographing prints or small objects using the lamp-house as a source of light.

Various light sources may be used in enlarging lanterns so long as provision is made, where a condenser is used, for raising and lowering the light and for forward and sideward movements. The ideal form, from some points of view, is the electric arc, but this is somewhat expensive and extravagant of current. The gas-filled type of electric lamp is quite satisfactory, particularly if a lamp with a projection type filament is obtained. A 100-watt or 150-watt lamp should be used to get a strong enough light.

Where the ordinary electric supply current is not available, one of the small 6-volt gas-filled bulbs, which are used in motor headlights, run off an accumulator can be successfully adopted.

When it is proposed to take a photograph with a view to enlarging a negative afterwards, care should be taken to see that the negative is fully exposed and developed for a somewhat shorter time than usual, in order to obtain a thin negative, which gives the best results in an enlarging lantern. A thin negative of this kind should be one in which, while every detail can be clearly seen, the densest parts will allow type to be seen through them when the negative is placed upon a printed page.

The Making of Enlargements. The process of making actual enlargements from small negatives requires very little practice, though it needs the cultivation of an eye for picture making, i.e. the selection of the best portion of the negative to enlarge, the suppression of irrelevant detail.

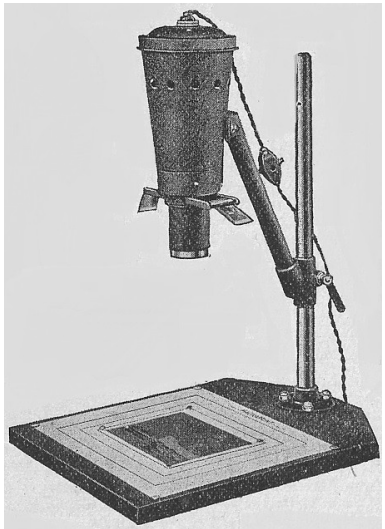


Fig. 7. Ensign "Magna-print" Enlarger for Midget and smaller sizes (*Courtesy of Kodak, Ltd., and Ensign, Ltd.)*

To make an enlargement, place the negative in the negative holder, with the top end of the negative nearest the photographer's hand and the film side towards the enlarging easel. If the negative is an oblong one, place it in the holder upside down with the film outwards. By noting these points the enlarged picture thrown on to the easel will not only be the right way up, but will also be the right way round.

Next, turn on the light and, with the negative in the slide holder, focus the front lens sharply on the enlarging easel according to the size of enlargement required. Then take out the negative and move the light backward and forward by racking the lantern house until the disk of light thrown on the enlarging easel is perfectly even. If the centre of the disk is more brightly illuminated than the rest, the light must be pushed forward; if, on the other hand, the centre is dark the light is too near the condenser and must be racked back a little. Minor inequalities of light on the easel can usually be rectified by placing a sheet of ground glass between the light and the condenser. This diffusion of the light will help to render less conspicuous in the enlargement scratches and other minor defects in the film of the negative.

Placing the orange cap over the lens, pin or otherwise fasten a piece of bromide paper on the easel in position so that the required portion of the picture falls on to it. Removing the orange cap, an exposure is made while three parts of the bromide paper are covered with a piece of card; then expose successively the three remaining parts of the bromide paper, giving each portion an equal exposure. Thus four exposures will be made on one piece of paper ranging from one to four times, and it will be easy to decide, after development, which of the four exposures was most nearly right.

No detailed guide for exposure in enlarging can be given, since the strengths of artificial light vary so greatly and the density of negatives differs so considerably. When the time of exposure for the particular negative has been found, a careful note of it should be made, either on the envelope containing the negative or in a negative record book. For details of developing and printing the reader should consult these headings.

One of the best developers for bromide enlargements is amidol. With prints that are correctly and not over-exposed development with amidol stops when the image is fully developed.

Many different types of bromide papers are available for enlarging purposes, varying from the ordinary glossy surface, used in press photography, and matt surfaces of different grades of smoothness, to very rough-surfaced papers, some giving by development warm black and brown effects. Smooth matt surface paper is more suitable to enlargements with much fine detail, while broad effects are obtained with the rougher papers. An enlarged print which is a little dull in colour, particularly in the shadows, may often be improved considerably by rubbing its surface with encaustic paste.

Making an Enlarging Lantern. A homemade enlarging lantern using a condensing lens, with the amateur's camera for projection and having all necessary adjustments, can be made for little more than the cost of the lens.

The body consists of 3-ply wood taken from a tea chest, the dimensions of which are shown in the sectional diagram Fig. 9. It is built up on a stout

baseboard, 16 in. long, 7¼ in. wide, and ¾ in. thick (Fig. 10). To this baseboard the two sides of the box which constitutes the lantern are screwed. They are 2 in. shorter than the baseboard; a removable end piece. A, carries a black velvet curtain to cover the end of the box and prevent light leaking out. The end piece fits loosely to permit the withdrawal of the lamp-house and its fittings. Its dimensions are seen in Fig. 9; the two sides are screwed at the top to a piece of wood 7¼ in. long, 2½ in. wide, and about ⅜ in. thick, and braced at the bottom by a piece 7¼ in. by ⅜ in., by ¼ in. It is shown partly withdrawn in Fig. 8.

The box has practically no top. At the front a cover, B, about 3½ in. or 4 in. deep, is provided (Fig. 9). Along the top of both sides strips of tin, C, 12½ in. long, 1⅝ in. wide, bent along their length at right angles are nailed and screwed. These angle strips are bent so that one side is at least 1 in. wide, the other being ⅜ in. or less, and this wider side is painted underneath with dull black in order to reduce light reflecting.

On the baseboard are fitted the tubes and sliding platform for the lamp-house. Dimensions are given in Fig. 10. The long tubes are fastened at each end to blocks of wood by strips of tin bent over and screwed to the blocks. The latter are kept in position by nails or brads round them (not through them) knocked into the baseboard. They are thus independent of the baseboard and the whole of this portion is easily removed. On the long tubes are placed two shorter pieces of slightly larger tubing, which slide freely and are connected by a stout plate of copper or other metal, soldered at each end. A slot is cut in the centre. Pieces of an old tubular brass camera tripod serve this purpose, or brass curtain rods of two sizes can be used.

On the centre plate the lamp-house proper is fixed; it consists essentially of a cigar box and an adjustable lamp carrier (Fig. 11). It is fastened to the plate by a bolt and nut, which passes through the slot on the plate (Fig. 10), thus permitting a sideways movement of the lamp house to allow for the adjustment of the light. Backward-and-forward movement is supplied by the sliding tubes on which the plate is supported; upward-and-downward movement by the adjustable lamp carrier. In this case an old focussing projection piece from a disused magic lantern was made use of, the lenses having been removed. Such pieces of scrap optical apparatus can be easily picked up from optical dealers or on second-hand stalls. An alternative arrangement for raising and lowering, the light is shown in Fig. 12, where an ordinary electric bell or wireless terminal, A, slides up and down on a rod, the flex of the electric lamp being gripped, not too-tightly, between two nuts on the shank of the terminal. Similar forms of light holders can be improvised.

The lamp-house is completed by two pieces of wood (Fig. 13), screwed on to the top of the cigar box with a circular hole cut in the centre to-allow the focussing piece used as the lamp carrier to pass through.

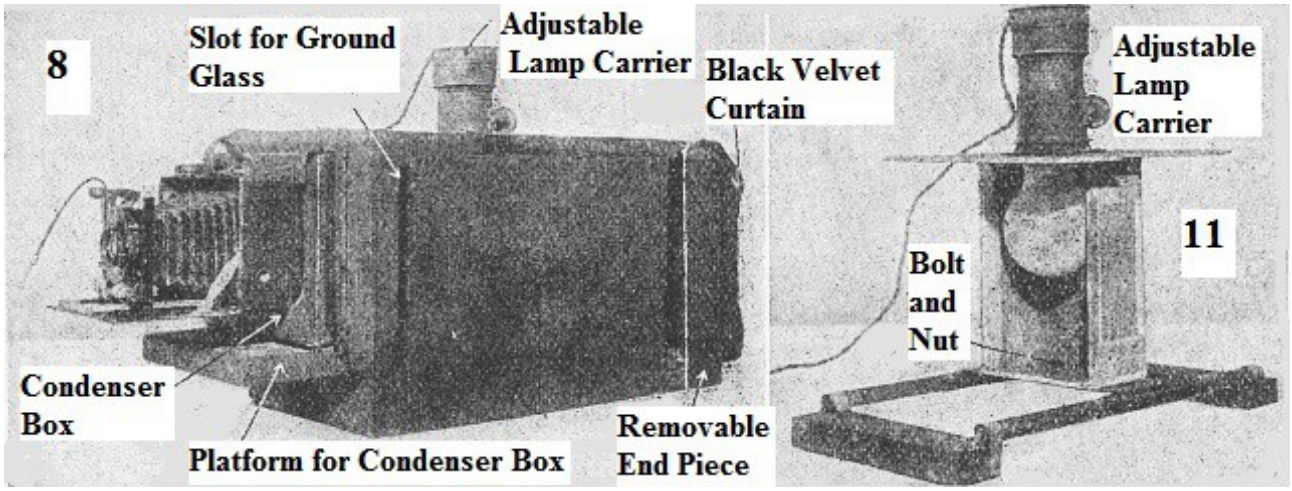
The purpose of these pieces is to provide a covering for the light when in the lantern. The covering moves with the light, and prevents direct rays escaping from the lantern, since it moves underneath the overlapping strips of blackened tin. If further means of light exclusion are required, pieces of 3-ply wood 7 ½ in. by 3 in. or 4 in. can be placed on top of the box at either end, according to the position of the lamp-house. At the front end of the lantern a slot is cut with a keyhole saw to take a frame holding a sheet of ground glass for diffusion of light, if necessary. The slot is cut at the height of the condenser, and a strip of wood is fastened inside to provide a ledge for the diffusing glass.

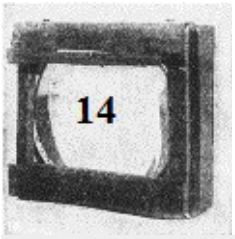
The condenser box is seen in the photograph (Fig. 14) and the diagram (Fig. 15). For a 5½ in. condenser, such as is necessary for enlarging ¼ plate negatives, a biscuit tin 6¼ in. square and about 2½ in. deep is required, or a larger one can be cut down to fit, the cut ends being turned over and soldered. An aperture is cut in the bottom of the tin 4½ in. wide and 3¾ in. deep, i.e. a little larger than a ¼-plate. A strip of copper the length of the condenser box and 2¼ in. wide is taken and bent over at right angles, one side of the bend being 1¼ in. wide, the other 1 in. A second strip of the same length 2½ in. wide is bent over at right angles, each bend in this case being 1¼ in. wide. These strips are bolted on to the top and bottom of the condenser box to allow the negative carrier to be pushed in between the strips and the box, gripping it but permitting free movement. On the copper strip which is bolted on to the top of the condenser box a hooked piece is soldered on to support the camera, as shown at A (Fig. 15). Its dimensions are given in the smaller diagram (Fig. 16). This hook fits into the slot at the back of the camera in which the focussing screen slides. The condenser is wedged into the tin box with pieces of wood cut to fit, or it may be properly mounted.

The condenser box is made a light-tight fit in the front of the lantern in the manner shown in the photo (Fig. 8) and in the diagram (Fig. 9). A solid piece of wood, D, about ½ in. thick and 6¾ in. wide, supplies a platform for the condenser box. It is screwed on to an upright piece, E, 7¼ in, by 1 in. by ½ in. On both sides uprights, F, of ¼ in. 3-ply wood are screwed, with a cross-piece at the top, of the depth required to make the condenser box a reasonably tight fit. When the condenser box is in position light leakages are stopped by stuffing strips of black cloth all round; these are nailed down with narrow strips of 3-ply wood (see photo Fig. 8).

To avoid moving the lantern backward and forward in enlarging different sizes the easel is arranged to slide along a plank 1 in. by 7 in. Details of its construction are seen in Fig. 17. The easel consists of an ordinary large-sized drawing board fastened to a sliding saddle-piece by means ot two copper brackets, which are cut out of a piece of 2 in. square metal and folded up as

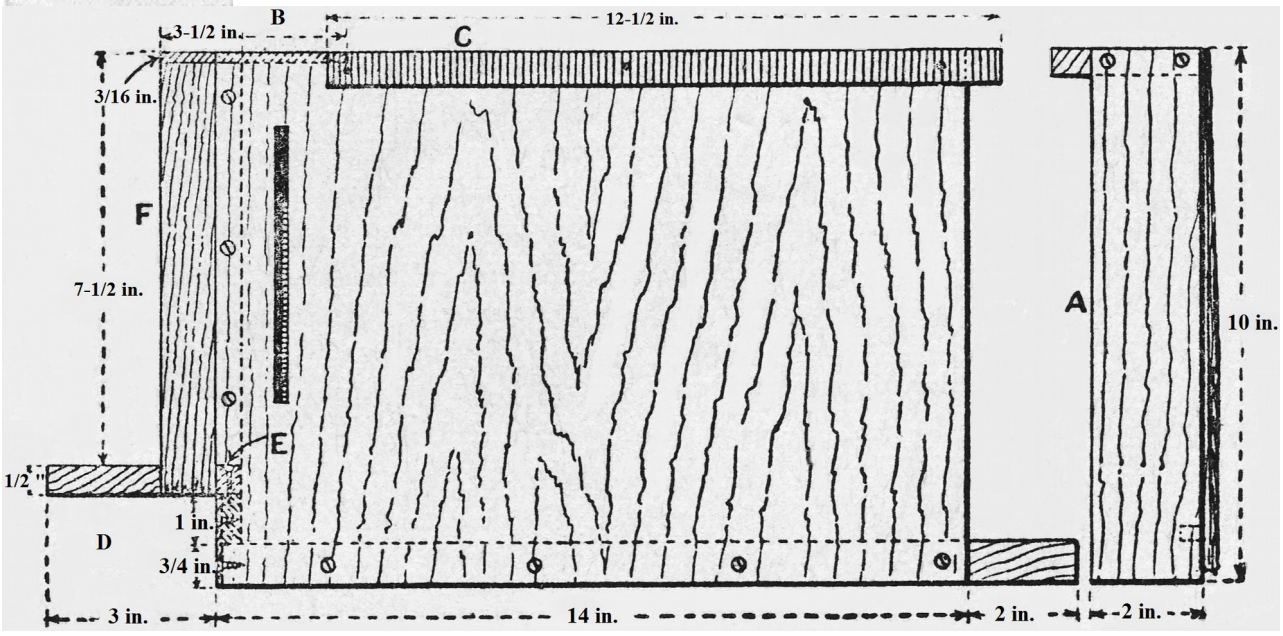
(Continued in page 781)





Enlarging. Showing a home-made enlarging lantern with condenser. Fig. 8. Lantern using electric light and amateur's camera. Fig. 9. Sectional diagram of body of lantern made of three-ply wood. Fig. 10. Baseboard and sliding platform for lamp-house. Fig. 11. Lamp-house and adjustable carrier. Fig. 14. Condenser box made from biscuit tin, showing arrangement for holding negative carrier and camera.

Fig 9 below.



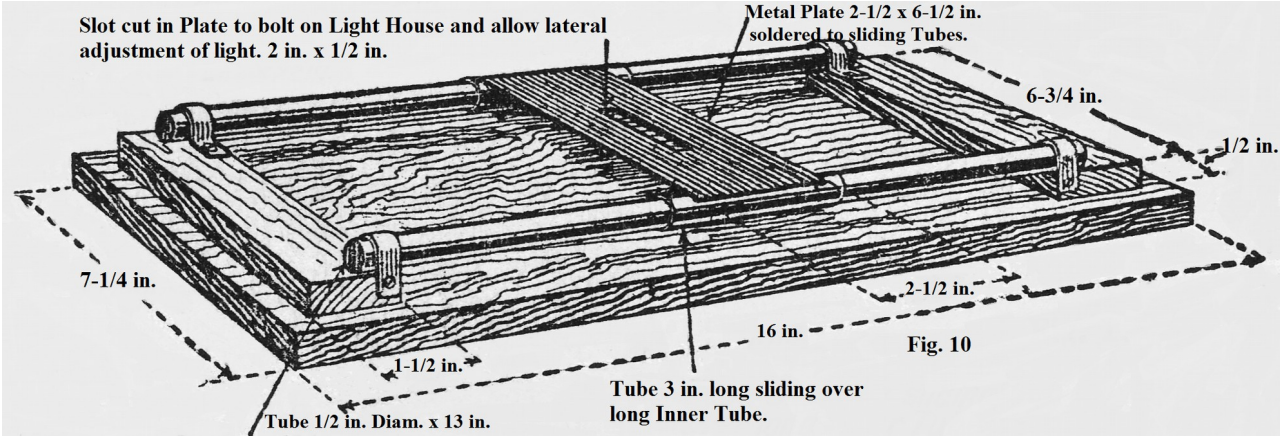


Fig. 10

Enlarging. Showing a home-made enlarging lantern with condenser.

Fig. 12. An alternative lamp holder for use with Electric light.

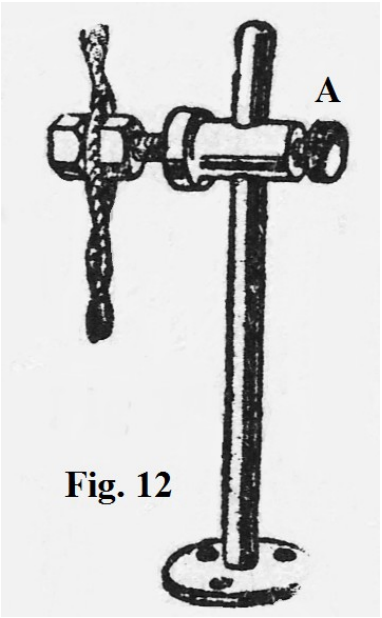
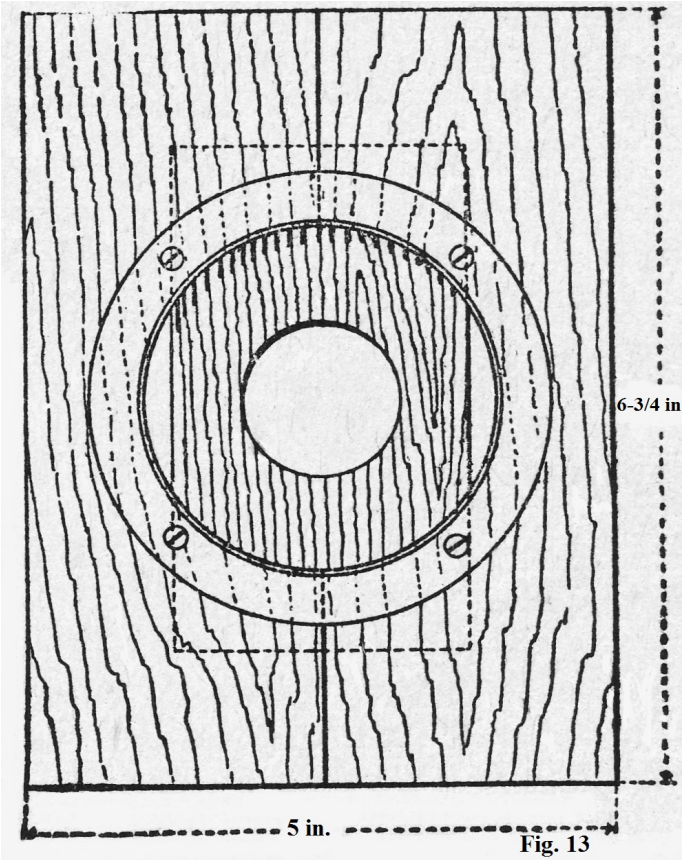


Fig. 13. Top cover for lamp-house and base for lamp carrier.



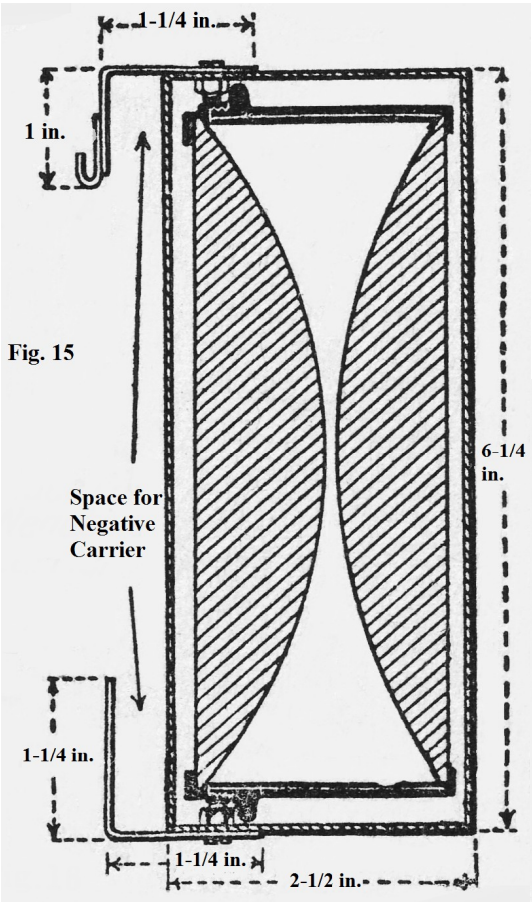
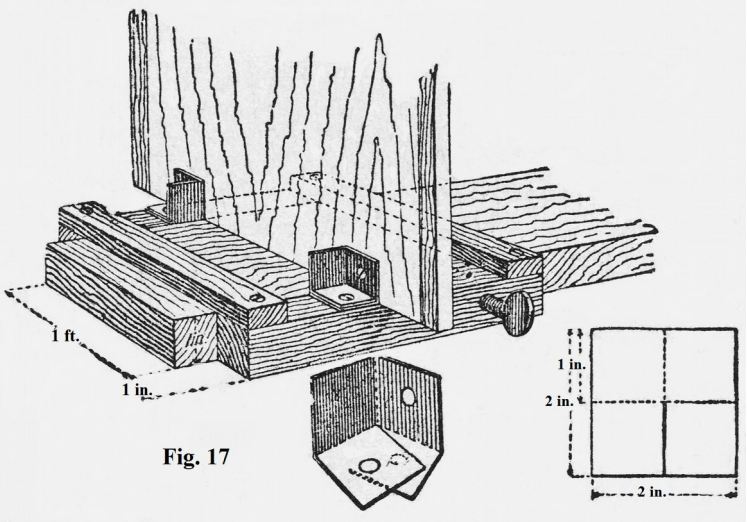


Fig. 15. Sectional diagram for construction of condenser box.

Fig. 16. Metal for strip holding camera soldered on front of condenser box.



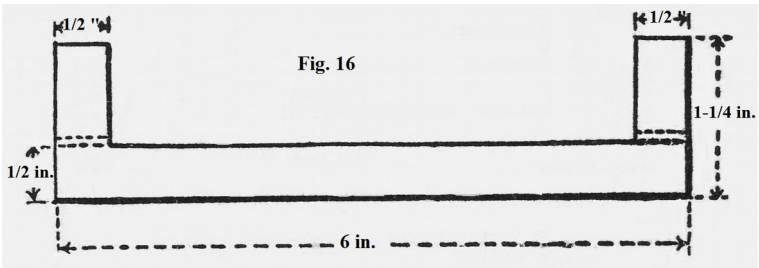


Fig. 17. Details of easel with method of attachment to sliding saddle.

shown in the dotted lines in the smaller diagrams in Fig. 17. A thumbscrew passes through the saddle, gripping the edge of the plank to keep the easel fixed in the desired position.

Enteric. *See* Typhoid.

Enteritis. The meaning of enteritis is inflammation of the intestine. *See* Colitis; Diarrhoea; Intestine.

ENTRÉE. This name is given to made-up dishes such as chicken cutlets, quenelles, fricassées, rissoles, ragoûts, soufflés, etc., and may be either hot or cold. If more than one entrée is served, the hot should precede the cold. The remains ot fish, poultry, game, and meat can be used, and kidneys, sweetbreads, and livers are employed. The entrée course at dinner follows the fish, and precedes the joint.

Entrée Dish. These are made in silver. Sheffield plate and electro-plate, and may be purchased singly or in pairs. Such dishes are often found with a detachable handle, which enables the cover to be turned upside down and each dish made into a pair. Sometimes they have fixed liners with a space between the two parts for hot water. The entrée dish lends itself to rather elaborate ornament, and good 18th century specimens fetch hig prices. *See* Sheffield Plate; Silver.

ENTREMET. This term is applied to a dishes of dressed vegetables, such as cauliflower au gratin, cassolettes of cucumber, etc., as well as to hot and cold sweets and after dinner savouries.

ENURESIS. In young children enuresis or bed wetting is sometimes a very troublesome complaint. It is not wise to make a fuss about it, and in an ordinary case, there should be no threat of punishment. The bedclothes should not be too heavy, and the child should not be allowed to bury himself beneath them, nor to sleep on his back. An old method of preventing this is to tie a cotton-reel on the small of the back.

The diet should be simple, avoiding spiced food and condiments, and the last meal should not be heavy nor too near bedtime. No fluid should be allowed within an hour or two of going to bed. The bladder should be emptied just before getting into bed, and the child should be awakened in an hour or so to empty it again. A mackintosh sheet and draw sheet should be used. If constipation is present it must be corrected, and the motions should be observed for the presence of threadworms. In boys circumcision is sometimes necessary. Adenoids and enlarged tonsils are a common cause. When no obvious cause is present, suggestion may be a valuable help.

EPACRIS. This evergreen heather-like shrub is suitable only for cultivation in a heated greenhouse where the various kinds bloom in autumn, winter and spring. It belongs to the group known as hard wooded plants and is not an easy plant to grow well. In spring when the flowering season is over the plants should be pruned; any repotting that may be necessary is done then. A suitable compost consists of peat (or peat two-thirds and loam one-third) with sand added freely. The pots must be well drained. Great care in watering is necessary to ensure that the soil becomes neither sodden nor dry. Propagation is by cuttings inserted in pots filled with sandy peat and placed in a propagating case under glass in summer.

EPIDEMIC. The name epidemic is given to a disease when it affects a large number of people at one time. The disease is usually one due to a microbe, but other causes may operate and affect large numbers of people, e.g. a poison contained in some article of food or lead poisoning from pollution of water by lead pipes. These epidemics of poisoning and of deficiency diseases, when once their nature and causation are apparent, can be easily brought to an end.

Notification and isolation have helped to limit the spread of most infectious diseases. In the case of small-pox, vaccination has been invaluable; and in the case of what are known as the water-borne diseases, e.g. enteric fever and cholera. The same may be said of control and, if necessary, the sterilization of water and milk supplies. Much may be done to limit the extension of diseases in which insects, such as the mosquito, flea, house-fly, etc., are the agents of infection, by measures of exterminating the insects or for affording protection from their bites or contamination. Protective inoculations with serums and vaccines, by increasing the resistance of the body, have proved successful.

It is not clear why some epidemics occur at more or less regular intervals. In the case of diseases which may affect the same person repeatedly, there will be a certain period of immunity after the illness and, as in the case of influenza, the epidemic may sweep over the community in a series of waves separated by varying intervals of time. Widespread meteorological conditions may be factors and lowered resistance affecting large communities because of food shortage. *See* Inoculation.

Epidermis. *See* Skin.

EPILEPSY or Falling Sickness (Grepilēpsis, seizure). Disease of the nervous system characterised by periods of unconsciousness. Epilepsy most commonly begins in childhood, before the fifth year. The fundamental cause is unknown, though fright, injury alcoholism, and an attack of illness appear to be exciting causes. The offspring of those parents who suffer from insanity or neurasthenia are more prone to exhibit epilepsy than are other children.

The incidence of epilepsy would be much diminished if epileptics refrained from marrying and having children, every child of an epileptic need not have the taint, but in a family some members are almost sure to have it.

Two forms are recognized. In petit mal the attacks of unconsciousness often last no longer than a few seconds and there are no convulsions. Grand mal is characterised by the occurrence of convulsive fits. The subject may have a preliminary sensation or aura, which warns him of what is going to happen. Sometimes the beginning of the fit is marked by a loud cry. At first the muscles are rigid, and suspension of respiration causes blueness of the face. After a few seconds, violent convulsions occur, and the tongue may be severely bitten. After one or two minutes the patient passes into a state of somnolence, which may be succeeded by prolonged sleep.

During an actual fit all that can be done is to prevent the patient from hurting himself. He should be allowed to remain in the recumbent posture, the clothes should be loosened round the neck, and a roll of cloth should be introduced between the teeth to prevent the tongue from being bitten. The most useful drugs are the bromides of sodium and potassium. These should be given for a long period. Careful attention must be given to the general health of the sufferer.

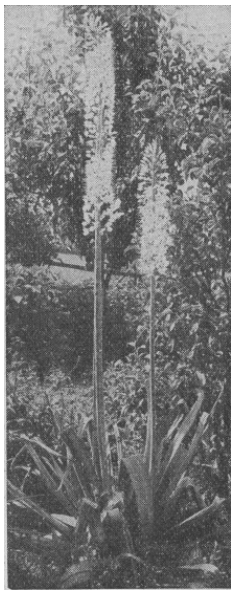
Epispastic. *See* Cantharides: Counter Irritant.

EPSOM SALTS. Sulphate of magnesium in the form of Epsom salts is much used for purgative action, the best time for taking it being immediately on waking in the morning. A moderate dose for a grown person is a teaspoonful in a tumbler of hot water. For stronger action 2 grains of calomel may be taken at bedtime and Epsom salts first thing in the morning. Some people find it easier to take the effervescing magnesium sulphate, of which ½ to 1 oz. may be taken in a glass of water and drunk while effervescing.

In certain cases of heart disease or Bright's disease, where the tissues are becoming waterlogged through the fluids in the blood escaping through the vessel walls, morning doses of Epsom salts sometimes give good results by removing from the system any excess of fluid. In this case the dose is dissolved in the smallest quantity of water which will take it up, in order to encourage a free escape of fluid from the walls of the bowel. *See* Aperient; Constipation.

ERCILLA. This is a self-clinging evergreen creeper, with leathery leaves and racemes of purplish flowers, which spring from the axils of the leaves. It is suitable only for walls, for it is not very hardy. Any ordinary soil suits it, but sandy loam is best. Propagation is by cuttings in summer in a frame. Another name for this plant is Bridgesia spicata.

EREMURUS (Giant Asphodel or King's Spear). These remarkable plants produce a large tuft of long strap-shaped leaves and in early summer send up tall strong spikes, the upper parts of which are covered with closely massed flowers. The large fleshy roots are of extraordinary formation: they radiate from a central bud like the spokes of a cart wheel.



Eremurus. Giant Asphodel or King's Spear (E. himalaicus), 6-8 feet high with white flowers.

Planting is best done in early autumn, and a shelter-ed place, e.g. among shrubs, must be chosen, for the plants start into growth early. There should be a 6-in. covering of soil above the roots, which must be handled carefully because they are brittle. Welldrained loamy soil suits them best; clayey land must be made suitable by adding old turf, sand and some leaf-mould or decayed manure. It is advisable to protect the roots in winter by placing ashes or leaves on the soil above them. The best method of propagation is by seeds sown in a frame as soon as they are ripe. Eremurus robustus bears pale rose-coloured flowers on a stem up to 10 feet high: himalaicus, with white flowers, grows 6 to 8 feet; Warei, reddish bronze, is 6 feet or more high. Bungei, 4 to 5 feet, with yellow flowers, is one of the best for small gardens.

ERGOT. The ergot, a fungus which sometimes appears among grasses and weeds, is very fatal to the plants attacked. The ergotted seed becomes black and elongated like the spur of a cock, from whence it derives its name. The remedy is to gather and burn all infected plants.

Poisoning by Ergot. Ergot is used in medicine, but should only be taken under the doctor's direction. In acute ergot poisoning following on an overdose of the drug, the chief symptoms are violent sickness and diarrhoea, headache and dizziness. These symptoms may gradually pass or may increase in severity, the patient falling into rapid convulsions, leading to loss of consciousness and death. While waiting for the doctor, an emetic, e.g. a tablespoonful of mustard in half a tumbler of water, may be given, and when the patient has vomited thoroughly, 2 tablespoonfuls of castor oil. Strong hot tea should also be given freely. Symptoms of poisoning may also appear through eating bread containing rye which has been attacked by the fungus.

ERIGERON. (Summer Starwort.) This is a most valuable plant for the herbaceous border; in summer it bears numerous large daisy-like flowers on stems up to 2 ft. high, in shades of lavender, purple and other colours.The plant thrives in ordinary well cultivated soil and can be increased by division in the autumn or by sowing seeds in a box of soil in a frame in spring.

The commonest kind is Erigeron speciosus, 2 ft. high with mauve-purple flowers; speciosus superbus with more richly coloured blooms is finer. Quakeress, lavender, is one of the best of all; other fine modern varieties are B. Ladhams, rose-pink; Pink Pearl, blush-

pink; Asa Gray, apricot-buff; Amos Perry, lilac; and Fontainebleau, lavender-blue. Alpinus, 9 in., purplish blue, and aurantiacus, 6-8 in., orange yellow shade, are suitable for planting in the rock garden.



Erigeron. The Summer Starwort, a beautiful hardy border flower.

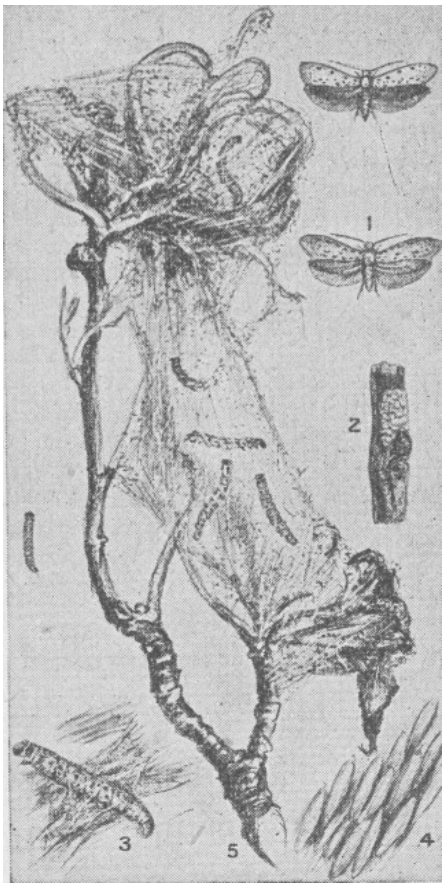
ERINUS. Erinus alpinus is a pretty little plant of tufted growth suitable for crevices in the rock garden; it flourishes best in well-drained gritty soil. It is not as a rule long lived, but can easily be increased by seeds sown in spring in the rock garden where the plants are to flower the following year. Erinus alpinus is only 4 or 5 inches high, and bears rose purple flowers in early summer.

ERMINE: For Wear. Ermine, which is the fur of the stoat, is mostly obtained from Canada and Russia, the coat of the British stoat not changing colour to pure white in the winter to the same extent as it does in northern regions. The skins are narrow and about 10 in. long, the tail being white with a black tip, and the fur short and close. What is known as summer ermine is the beige colour fur of the stoat's coat in summer.

Ermine loses its whiteness, and becomes yellow with age: it can be cleaned, but once the yellow tinge appears, bleaching will not restore its pristine purity. This yellow colour may be kept from appearing for a considerable time if the fur is stored away in darkness when not in use.

Ermine is trying to the complexion, and looks best in the evening for coat, collar, or wrap. Being easily soiled, ermine needs to be treated with great care. After use it should be wiped over lightly with a fine white cloth and wrapped between layers of tissue paper. When badly soiled, ermine is best sent to the cleaners; but if it is to be treated at home, cornflour should be rubbed in with the tips of the fingers, and afterwards brushed out with a soft, white-bristled clothes brush. *See* Fur.

ERMINE MOTH. The small ermine moth is found in nearly every orchard and garden, and the caterpillars are very destructive to trees and shrubs. The moth itself may be identified by its upper pair of wings, usually of a leaden whiteness, with small black spots on the edges of the wings, which also are fringed with livid-coloured hairs. The caterpillar is about ½ in. in length, the body being a dirty yellow or leadish-white and the head brownish.



Ermine Moth, an orchard pest. 1. Mature insect. 2. Egg mass. 3. Caterpillar. 4. Cocoons. 5. Apple shoot with web. (Ministry of Agriculture and Fisheries and H.M. Stationery Office)

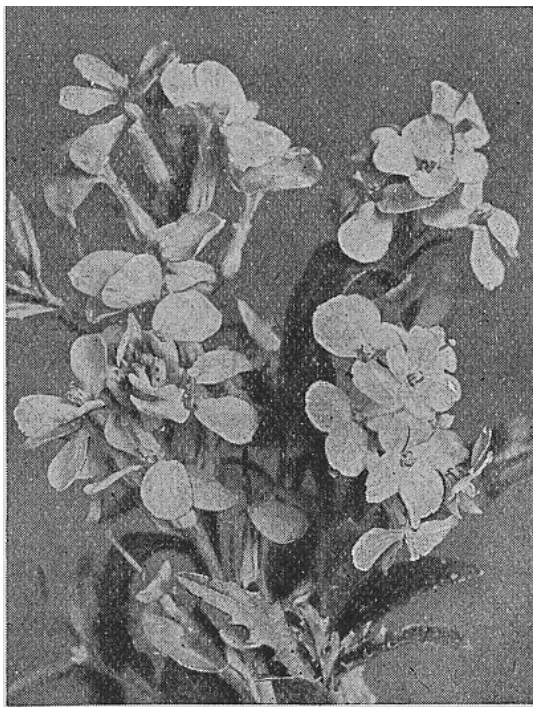
The moth often selects apple, pear, plum or almost any fruit tree on which to deposit eggs in masses near leaf-bud and blossom. The caterpillars are hatched during autumn, but rest under a protective scale until trees are coming into leaf, and then spin a thick web of threads round a young shoot, enclosing foliage, within which they live, feeding upon the leaves.

When each caterpillar is full grown it encloses itself in a cocoon of white silk, in which it pupates until the month of July, when it emerges as a moth. Remedies are to kill the moths before they deposit eggs, and burning or crushing of the caterpillars while in their webs.

According to Leaflet No. 40, issued by the Ministry of Agriculture, the most satisfactory treatment for affected trees and hedges is to spray them soon after the blossom is over with lead arsenate (1 lb. of lead arsenate paste to 20 gallons of water).

ERYSIMUM (Fairy Wallflower). Free flowering annual and perennial plants with small wallflower-like blooms in yellow, orange and other colours. The two most popular annuals are arkansanum, yellow, and peroff-skianum, orange. They do best when sown out of doors in early autumn to bloom in spring and early summer. Seeds may, however, be sown in spring to provide plants in bloom from July onwards. They

flourish in ordinary soil, preferably that which is not clayey. Erysimum rupestre is a rock garden plant, 3 or 4 inches high, which bears yellow flowers in summer. It is easily grown in sandy soil.



Erysimum. One of the fairy wallflowers (Erysimum arkansanum), a hardy annual.

ERYSIPELAS. Erysipelas, or St. Anthony's fire, is an acute, rapidly spreading inflammation of the skin, and sometimes of the underlying tissues, accompanied by heat, swelling, redness and pain of the affected part, together with high fever and general prostration. The temperature may run up to 103° or 104° F., and the patient will very likely become delirious. The skin of the face is the most common site, and large or small blisters may be present. The patch spreads rapidly, the parts first attacked getting paler and perhaps scaling. If the eyelids or scrotum are involved, there may be much swelling owing to the laxity of the tissues in these situations.

The disease is due to a germ, a streptococcus, like those which cause suppuration, finding its way into the skin. Infection may take place through an open wound of any kind, even a slight scratch. Debilitating diseases, such as diabetes and Bright's disease, and alcoholism, by weakening the resistance of the tissues, predispose to the disease. Erysipelas is a disease notifiable to the authorities, and treatment should be in the hands of the doctor. *See* Infectious Diseases.

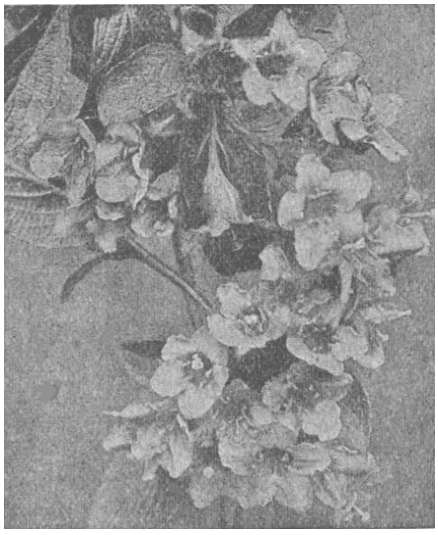
ERYTHEMA. This is a blush or reddening of the skin occurring in patches of various sizes which temporarily disappear upon pressure. It is due to many causes, such as emotional disturbances which produce blushing; external irritation in the case of chilblains; effects of heat and sunlight; friction of the skin by ill-fitting clothes, etc.; counter-irritants like mustard; nervous influences, e.g. neuralgia; and poisonous substances in the blood, e.g. belladonna; poisons derived from the bowel, etc. Where there are no symptoms other than redness of the skin, with perhaps slight itching and burning, the application of a lotion such as the following usually gives immediate relief:

Boracic acid	1 dram
Carbolic acid	40 minims
Glycerin	2 drams
Water to make	4 oz.

The lotion should be mixed with equal parts cold water and sopped on to the skin. In erythema due to chafing, the irritable parts may be dusted several times a day with a powder composed of zinc oxide 1 part, magnesium carbonate 1 part, starch powder 2 parts. The part should be washed before applying the powder.

Erythema multiforme is an acute inflammatory skin disease characterised by papules, lumps, red patches and sometimes blisters on the skin. Erythema nodosum is characterised by pinkish-red round or oval swellings chiefly over the shin bones. The treatment should be supervised by the doctor, unless it is slight. If the digestion is poor or the patient is of a constipated habit these matters should be put right.

ESCALLONIA. These are beautiful summer-flowering shrubs, most of them being evergreen. They are not very hardy, and in all except the mildest districts must be grown on a sunny wall. Escallonia macrantha, with attractive evergreen leaves and rose-coloured flowers, makes an admirable hedge in seaside gardens in mild localities, but elsewhere it needs the shelter of a wall. One of the hardiest is Escallonia langleyensis, a vigorous shrub 6 feet or more high, which may be grown in the open garden in southern counties and bears rose red flowers. Exomensis and philippiana, both with white flowers, are two fairly hardy sorts. Escallonias thrive in ordinary soil and are propagated by cuttings set in sandy compost in a frame in summer.



Escallonia macrantha, a crimson-flowered hedge shrub which thrives in seaside gardens.

Eschscholtzia. This is the botanical name of a showy hardy annual, the Californian poppy (q.v.)

ESKIMO DOG. Most of the Arctic and sub-Arctic dogs share certain features in common, being of a wolfish appearance. The head of the Eskimo particularly takes after that of the wild animal, but the dog differs in one respect by carrying its tail tightly curled over the back. The colour may be white, black, black and white, silver grey, etc. Opinions vary about their disposition. Some say they are uncertain in temper, others give them excellent characters. *See* Dog.



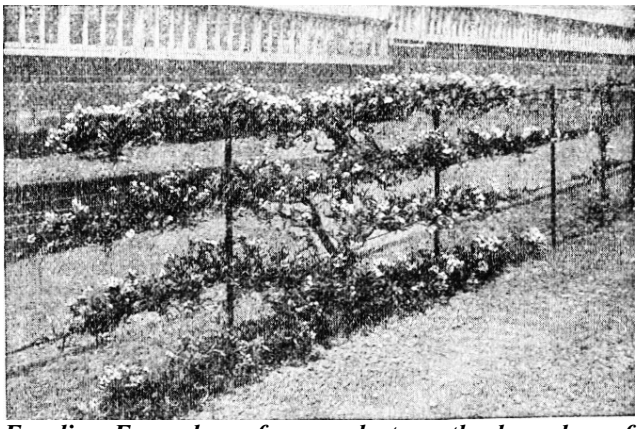
Eskimo Dog. Specimen of the breed, which in appearance is closely akin to the wolf.

ESPAGNOLE SAUCE. From this rich brown foundation sauce many other varieties are prepared. It can be made by melting 2 oz. of butter in a stewpan, and adding to it 3 oz. of ham or bacon cut into dice, a bunch of parsley and herbs, tied together, an onion and a carrot (sliced), 1 tablespoonful of chopped mushrooms, 3 peppercorns, and a clove. Fry all these a light brown, then add 2 oz. of flour.

When this is also brown, pour in 1 pint of brown stock, add 3 sliced tomatoes, and let the sauce simmer gently for ½ hour, stirring it occasionally and keeping it well skimmed. Add a wineglassful of sherry, with seasoning to taste, and then rub the sauce through a sieve or tammy cloth, adding a little more stock if it is too thick. The wine and mushrooms may be omitted.

ESPALIER: For Fruit Trees. The Horizontal espalier tree is a Convenient type for planting alongside the paths in the fruit and kitchen garden, the branches being trained on wires stretched between posts. Such trees, if correctly managed, produce exceptionally fine fruits. They are suitable also for planting against a wall. Apple, pear and plum are usually grown in this form. The trees may have one tier or, as is shown in the illustration, several tiers of branches. A fresh tier is formed by allowing a shoot at the top of the main stem to grow until it is 12-14 in. high; the top is then cut off, and when side shoots develop one on each side is selected and trained horizontal at about 12 in. above the tier beneath. Other shoots are rubbed off.

At the winter pruning the new branches should be cut back to within 12 in. of the base of the previous summer's growth; thus they will extend every year by about 12 in. The summer pruning consists of shortening all side shoots late in July to within 6 in. or so of the base; in winter these are cut back to within about three buds of the, base. *See* Apple; Cherry; Fruit; Pear; Plum, etc.



Espalier. Example of an apple tree, the branches of which have been trained horizontally along wires bordering a kitchen garden.

ESSENCE. Essences are the essential oils from aromatic plants, obtained by a process of distillation and made into solution with pure alcohol. They are much used in the preparation of sweet and savoury dishes. The commonest used are essences of vanilla, lemon, almond, cloves, peppermint and ginger. These are very strong and one or two drops are sufficient to provide the flavour required.

To make essence of lemon, 1½ cupfuls distilled water should be mixed with 1 cupful pure alcohol and ¾ oz. oil of lemon. Saffron should be used to colour. Orange essence is made from 6 oz. alcohol mixed with ½ oz. sweet oil of orange, and coloured with cochineal. Almond essence is made from ¼ oz. oil of bitter almonds, 1 tablespoonful distilled water and 1½ cups alcohol.

Essence of cloves is prepared by infusing ¼ oz. cloves in 2 oz. proof spirit for the period of a fortnight, straining it and then bottling the essence for use.

To make ginger essence, ½ oz. freshly powdered ginger, ¾ oz. lemon rind, and ½ pint brandy or spirits of wine are needed. Let the rind and ginger soak into the liquid for a fortnight. Shake the whole daily, and then strain and bottle it, when it will be ready for use. *See* Almond; Lemon; Vanilla.

ESSENTIAL OIL. The chief flavouring part of vegetable substances is known as the essential oil. That of lemon, for example, has the complete odour of the lemon, essential oils being distinguished from fixed oils by this characteristic property. Almond yields both an essential and a fixed oil, but it is only the former that smells of almonds. Essential oils differ from fixed oils in not leaving a greasy stain on paper.

ESTATE DUTY. This term is used for the duty payable in the United Kingdom on death from the estates of persons who leave property. It was first imposed in 1894 and is graduated according to the value of the estate. The value of all property left, real or personal, settled or unsettled, is added together and duty charged thereon at the rates noted next page.

In the case of small estates, i.e. those under £500, the executors can pay, if they prefer, a sum of 30s. if the value is not more than £300, and of 50s. if it is between £300 and £500. This frees them from all other charges.

The payment of the duty on estates of high value may be made in the form of real or leasehold property which is part ol the deceased's estate. Certain classes of war loans are taken in payment at their face value, provided the deceased had held the stock for a certain period.

Other provisions of the law about estate duties deal with gifts made during life (inter vivos). If such were made within three years of death they are regarded as part of the estate and duty is charged thereon. If the gifts were for charitable or public purposes the period allowed is one year. Exceptions to this are gifts less than £100 in value, settlements made on marriage and those which were part of the deceased's normal expenditure, e.g. an annual allowance to a daughter.

Personal estate and real estate are valued separately for death duties. On personal property interest at the rate of 4 per cent is charged from the day of death until the settlement of the account. On real property the duty may be paid by instalments over a period of eight years. In this case interest of 3 per cent. is charged, but only from 12 months after death. *See* Executor; Legacy Duty; Probate; Will.

Exceeding £	Per cent	Exceeding £	Per cent
500	2	75,000	18
1,000	3	85,000	19
5,000	4	100,000	20
10,000	5	120,000	22
12,500	6	150,000	24
15,000	7	200,000	26
18,000	8	250,000	28
21,000	9	300,000	30
25,000	10	400,000	32
30,000	11	500,000	34
35,000	12	600,000	36
40,000	13	800,000	38
45,000	14	1,000,000	40
50,000	15	1,250,000	42
55,000	16	1,500,000	45
65.000	17	2 000,000	50

Estate Duties. Table showing the scale of duties in force after the Budget of 1930, in which the rates on fortunes of £120,000 and over were increased.

ESTIMATE. An estimate is a statement giving the probable cost of an undertaking by one who is prepared to do the work. Before building, repairing, or decorating a house, laying out a garden, removing furniture, it is advisable to ask builders and others for an estimate. If desirable, estimates can be obtained from two or more firms and the prices compared. The lowest estimate, however, is not always the most economical.

The success of any estimate depends to a large extent on the care and accuracy with which the inquiry is expressed; no one can quote a price for a piece of work unless the requirements are set out in sufficient detail. There should be a clear, precise, and definite statement of the work to be done, when and how it is to be done, the materials to be used, terms of payment, and a penalty clause for failure on either side. Often when an inquiry is made the terms are ambiguous or indefinite, with the result thet some misunderstanding arises later.

When a house is to be built, it often pays to engage an architect or quantity surveyor to prepare a bill of quantities. This includes a list of everything to be used in the work, and is the safest method to adopt, as the surveyor will see that the work has been done and the materials used in the right way and without waste. On the other hand, if a professional is called on to advise or quote for a piece of work, it is assumed that he will perform the task in a workman-like manner, and failure to do so is justifiable cause for complaint by the employer.

Estimates for building need to be examined with even greater care. An estimate becomes a contract when it is accepted, but it may contain a clause providing for an increase in the figure in the event of any change in the rate of wages or prices of materials, and adjustments of this kind, must be allowed for or the contractor can withdraw. *S e e* Architecture; Bungalow; Cottage; House.

ETHER: Use in Medicine. The purified form of ether is employed for producing anaesthesia. It may be sprayed on the skin to freeze it, and diminish the pain of an incision or puncture, or on tender points in neuralgia. As a general anaesthetic ether is preferable to chloroform in many cases, because it acts as a heart stimulant. It may also be used as a rapid stimulant in fainting, collapse and cardiac weakness generally, as a carminative in flatulent dyspepsia, and as an antispasmodic in asthmatic conditions. Ether should not be administered by an unauthorised person. The drug is very inflammable, and should never be handled near lamps, fires, etc.

ETIQUETTE: Some General Rules. The rules of etiquette which obtain in a social, business or professional environment form a safeguard in dealing with other people correctly. This is particularly the case when the surroundings are new and formality has to be observed with strangers, without any stiffness.

For instance, in the case of a family settling in a country district after living in a large town, certain differences of etiquette should be studied. Of these the two most important are that the new arrival should not call on anyone first, and should be careful to distinguish between calls and card leaving, by returning the same form of civility in each case. To call on someone of a higher social position who had only left cards would be to appear pushing, and perhaps cause a prejudice against the newly arrived family. On the other hand, to return cards where a friendly call has been made would be frigid, and be taken to mean that the acquaintance was not cared for.

Another instance where a knowledge of etiquette may be of importance is in the case of women whose husbands' profession stations them abroad. By observ-

ing the strictly correct procedure they avoid getting into a wrong set, because, by being polite but not intimate, they gain time to form a cool judgement without giving offence. The best plan is to follow the advice of someone who is already well established in the locality. A general rule which may be followed when in doubt is that it is wiser to err on the side of formality, and that if possible when confronted with a custom or anything which appears strange it is well to observe how other people meet it.

Appointments should be punctually kept, whether business or private. Letters should be answered as soon as possible. Invitations should be clearly and cordially expressed, and replied to in the same vein. A letter of introduction should always be given to the person it is intended to benefit open and delivered open. If not used the giver should be notified and the reason explained, with thanks for the kind intention. It is not necessary to introduce people to each other unless they are likely to have something in common, but where there are only one or two persons present it is better to introduce them than to allow anyone to feel awkward. Whatever the respective rank, age, or position, the man is always introduced to the woman, and unmarried women to the married, unless the former is of superior rank. The onus of future recognition rests upon the person to whom the other is introduced.

Men and Women. The rules of etiquette between men and women have been somewhat modified. In social life a man would rise when his hostess or other women entered the room or stood; he would open the door for them and follow their lead. In business this would be absurd. Some years ago it would have been a hard and fast rule for a man to give up his seat to a woman standing in a train or public conveyance. Now a business girl realizes that an older man may be more tired than herself, but anyone on being offered a seat should accept it graciously without argument.

When walking with a woman a man should be on the kerb side of the pavement, and should never greet or leave her out of doors without raising his hat. The rule for a man about paying fares for a woman is one which admits of variation. Many independent women think it unfair to allow a man to pay. Whatever the reason they should not argue and a woman should always be prepared to pay for herself quickly to save any awkwardness.

As far as the ballroom is concerned, it is worth while cultivating certain little courtesies, which go hand in hand with good manners. Always avoid dancing steps which draw attention to yourself, and never show off unless you happen to be an exhibition dancer. Introduction, though a simple matter, is one very few people take the trouble to perform gracefully. At a dance, or anywhere else, the man should be taken up to the girl, and the person who performs the introduction, with a slight inclination of the head towards her, should say: "Miss------, may I introduce Mr. -----," and then, inclining the head towards the man, say: "Mr. ------, Miss——."

Never hurry over an introduction, and pronounce the names very distinctly.

The etiquette which governs dress is not altogether founded on fashion, and its rules are best interpreted by suitability. The most elaborate clothes might be worn at a wedding which would look out of place elsewhere in the daytime. A greater laxity obtains now in these matters.

At many informal parties evening clothes are not expected, though when in doubt it is best to be formally correct. When staying in country houses people are expected to have the right clothes for any outdoor sports in which they take part, and to wear the correct evening dress for dinner. *See* At Home; Call; Cards, etc.

EUCAINE. Substitute for cocaine as a local anaesthetic. Solutions of the drug may be dropped into the eye or injected into the skin for operations on these parts, or injected into the gums for tooth extraction. In an ointment eucaine may prove useful in cases of intolerable itching.

EUCALYPTUS: Medicinal Uses. Eucalyptus oil is obtained by distillation from the fresh leaves of the Australian blue gum-tree. The dose is one-half to 3 minims, and it may be taken on lump sugar. It has been given in ague, in septic fevers, and in consumption and chronic bronchitis when the sputum is foul smelling. It is a strong antiseptic and disinfectant. The following makes a useful inhalation or spray in diseases of the air passages:

Eucalyptus oil	1 dram
Light carbonate of magnesia	½ „
Water to make	3 oz.

Add one teaspoonful of the above to a pint of hot water and breathe in the resulting vapour.

Eucalyptus ointment smeared on boracic lint is a good application for abrasions and burns. Tincture of eucalyptus is efficient tn arresting bleeding.

EUCHARIDIUM. This is a pretty, hardy annual, belonging to the evening primrose family. It may be sown out of doors in autumn to provide spring flowers, and in spring to yield summer flowers, It likes well drained soil in a sunny position. The favourite is Eucharidium Breweri, 6 inches high, with pale rose-coloured flowers which are slightly scented.

EUCHRE. This is a card game for two, three, or four players. Here the game is described for four players, who play as partners, two against two. Three varieties of packs are used. A 32-card pack, the ordinary full pack, from which all cards from the six to the two inclusive are omitted, a 28-card pack in which the sevens are also omitted, or a 24-card pack, on which all cards from the eight to the two are omitted.

The cards rank according to trumps. In the trump suit the jack, known as the right bower, is the highest card. The second highest card is the jack of the suit the

same colour as trumps. This jack is known as the left bower. The order of the cards is then the ace, king, queen, ten, etc., of trumps, followed by ace, king, queen, ten, etc., of the suit the same colour as trumps. In the two suits of opposite colour to trumps the order is as at whist. If a joker is used it becomes the highest trump.

The deal is by cutting, low dealing, ace being low, and for cutting all other cards counting as at whist. Five cards are dealt to each player, in one round of three at a time and one round of two. The next card is turned up for trumps. The game is to take at least three tricks by the player or partners who make the trump. If the players who call trumps fail to make the three tricks they are said to be euchred.

The eldest hand begins play by ordering up the trumps or passing. If he orders up the trump, then the dealer must take up the exposed trump card and discard one from his hand. But he does not take up the exposed trump until his turn comes to play, though he must discard immediately. If eldest hand passes, then dealer's partner may say, "I assist," thus ordering the dealer to take up the trump, or he may also pass, and so with the third player. Finally the dealer himself may take up the trump or pass. If he passes he turns the trump card face downwards on the top of the pack. If all have passed, the eldest hand has the right to name a fresh trump suit or pass, and each player in turn will have the privilege as long as the player before has not named the trumps. If all players again pass there is a fresh deal by the next player, eldest hand.

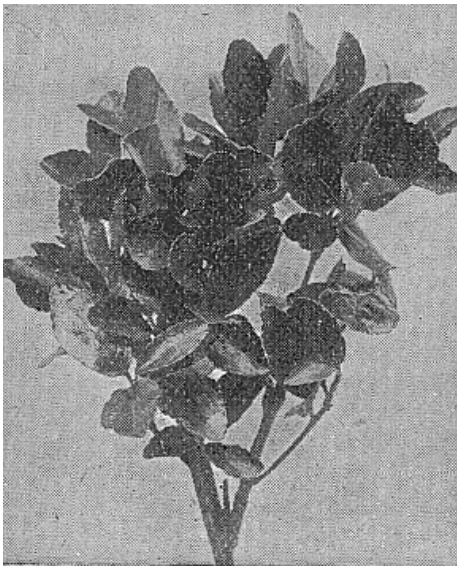
If a new trump is named of the same colour as the one rejected, it is called making it next, but if of the opposite colour it is called crossing the suit. If joker is played, it is customary to say before a deal what suit the joker shall represent if turned up. When the trump is made, eldest hand leads and each player in turn follows suit if possible. If not, he may trump or discard. The winner of each trick leads for the next trick. As each trick is made it is turned face downwards, and is not allowed then to be examined. A player who has named a trump may elect to play alone against his opponent, in which case his partner places his hand face downwards on the table and takes no further part in the play of that hand. The ordering up of the trump, the taking up of the trump by the dealer, or the making of a fresh trump, all come under this rule.

Rules on Revoking. If a player revokes and it is not discovered till the trick is turned over, the hand is abandoned as soon as the revoke is claimed and proved. Players must allow tricks to be examined at the end of the game when a claim for revoke is made, or they suffer the penalty of a revoke. If the revoke is discovered before the trick is turned the player's adversaries may take back their cards and play fresh ones if they wish, but the player's partner cannot. Exposed or cards dropped face upwards must be played at the first opportunity. A player who holds the incorrect number of cards cannot claim a misdeal after the first trick has been played, nor can he or his partner score that hand.

The players or partners who made the trump and win three tricks score one point. If they win five tricks they score 2 points. Failure to take three tricks is euchre, and the opponents score 2 points. A lone hand scores 4 points for five tricks; one point for three or four tricks; and his opponents 2 points if he is euchred. Two points are scored by a player's opponents for a revoke, and 4 points by lone hand if his adversaries revoke. The game is 5, 7 or 10 points up as may be agreed upon by the players. In three-handed euchre the maker of the trump plays against the other two players. He scores 3 points for a five-trick win, and one point for three or four tricks, and loses 2 points to each of his opponents for euchre.

EUGENOL. This is a colourless oily liquid smelling like oil of cloves, of which it is the chief constituent. It is strongly antiseptic and is not poisonous. When applied to mucous membranes it diminishes sensation. Eugenol makes a useful application in neuralgia and toothache, and is much used in dentistry. Eugenol may also be used to relieve itching, 10 grains in 1 oz. of lanoline.

EUONYMUS. This is a group of hardy evergreen and leaf losing shrubs, suitable for various purposes in the garden. Euonymus japonicus is a well known hedge shrub, which is particularly useful in seaside gardens, where it is less liable to be attacked by the magpie moth, which often disfigures euonymus hedges in inland gardens. Euonymus radicans and its variegated leaved variety are trailing shrubs which will thrive beneath trees and provide a useful evergreen ground covering. The common spindle tree (Euonymus europaeus) is very handsome in autumn when its brightly coloured fruits are at their best. All thrive in ordinary soil and are increased by cuttings set in a frame in late summer, or by seeds sown out of doors. Euonymus radicans is increased by division in autumn. From the bark of this shrub a dried extract, known as euonymin, is made, and frequently employed in medicine as a purgative.



Euonymus. The trailing Euonymus radicans which can be grown successfully beneath large trees.

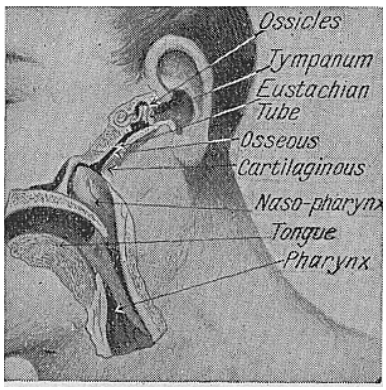
EUPHORBIA or Spurge. The genus of plants of this name includes annuals found in gardens and hedgerows, e.g. E. peplus and the common sun spurge, some shrubs, and plants which resemble cactus. When cut they exude a milky juice. The Euphorbia peplus, also known as petty spurge or devil's milk, is useful in asthma. Pilulifera, found in Australia and S. America, also known as Australian snake weed or cat's hair, is also used for asthma and for hay fever and coryza. Euphorbia obtained from an American species is a remedy for bronchitis.

In poisoning by a species of euphorbia there is vomiting and purging, the face becoming dusky. Give an emetic of mustard and water and a dose of castor oil, or, if the patient is vomiting, encourage by draughts of tepid water. Thereafter give demulcent drinks, thin arrowroot, etc. Keep the patient warm and if breathing ceases resort to artificial respiration. *See* Poisoning.

EUSOL. The compound solution of hydrochlorous acid known as Eusol is an antiseptic fluid made by mixing bleaching powder and boracic acid together in water. It loses its strength fairly rapidly, especially, in hot weather. It will be found useful in most conditions where an antiseptic lotion is necessary. It is too irritating for the eyes, though it may be sprayed on the throat.

Dakin's solution is a similar preparation and keeps better. It is prepared in two strengths. The stronger will keep for a month and should be diluted with six parts of water before used; the weaker is not suitable for use after a week. All these solutions can be obtained freshly made up from a chemist. *See* Antiseptic.

EUSTACHIAN TUBE. The Eustachian tubes are narrow passages about 1½ in. long, leading from the back of the throat near the posterior opening of the nose into the cavity of the middle ear. Each tube is lined with a delicate mucous membrane, and in health is always opened in swallowing, allowing the free passage of air into the middle ear cavity. The importance of this is that it allows the air pressure in the middle ear cavity to keep the same as that outside the ear drum, and thus a free movement of the latter is kept.



Eustachian Tube. Diagram showing anatomy of passages running from ear to nose and throat.

Sometimes in catarrh of the nose and throat the catarrh spreads along the Eustachian tubes, blocking it up and so preventing the free entrance of air to the middle ear. Partial deafness and buzzing sounds in the ear are frequently due to this cause. *See* Ear.

EVENING DRESS. Setting aside court dress, which is a matter of uniform or regulation costume, evening dress for men resolves itself into a well-cut dress suit and a dinner jacket suit. The swallow-tail coat and white tie are worn for the formal house or restaurant dinner, theatre or evening party. Either a white or black waistcoat is permissible, though the former gives a smarter, brighter appearance to the wearer. The dinner jacket, always with black bow tie, is worn for informal dress at home or out. It frequently makes its appearance now at smaller dances, is usual in the country house when a dinner party is not being given, at bridge parties, and for quiet theatre-going occasions.

When dining with formal acquaintances it is best to wear full evening dress if in doubt as to what is expected. Where the invitation is received through the post well in advance of the date of the party it is usually a sign that it will be a formal one, and require the regulation swallow-tails. For outdoor wear in large towns a black overcoat, crush hat, and white silk scarf are correct with evening dress.

EVENING PARTY. The formal evening party is often merely a reception, beginning about 9.30 and going on till after midnight. It may follow a dinner party to enable a larger circle of the hostess's acquaintances to meet some distinguished person in whose honour the evening's entertainment is given. In this case, those who are invited arrive at any moment within the time limits and stay as long as they wish, in just the same way as at an afternoon At Home. On the other hand, should there be a special feature, such as music, bridge, roulette, cinema show or lecture, it is usual to put this on the invitation so that the guests may arrive at the hour stated. Dancing also, if intended to form the staple attraction, would be mentioned. Evening dress is the rule.

For a mixed party including children, which might be given at Christmas or for a birthday, games are often introduced, card and conjuring tricks are popular if well done, charades are a never-failing attraction when thought out beforehand and dressing facilities are arranged, while such games as clumps and musical chairs have a perennial appeal. In the country the parties of such a description often start early in the evening.

For light refreshments or suppers at all these entertainments selections from the same kinds of food are served; sandwiches in all their varieties, meat jellies, mayonnaises, eggs or prawns in aspic, every sort of galantine, terrine, pie, cold sweet, savoury and ice. In the winter hot soups, served in cups, and in the summer iced drinks are in special demand. Iced drinks;and ices should be available throughout the evening, and where there is no staff to distribute them the guests should be asked to help themselves to refreshments.

Informal Parties. Some hostesses specialise in small Sunday evening parties, only inviting those who are

likely to enjoy each other's society, and without any formality. It is usual to serve a sit-down or help-yourself supper about eight o'clock at this type of party, and evening dress would be optional.

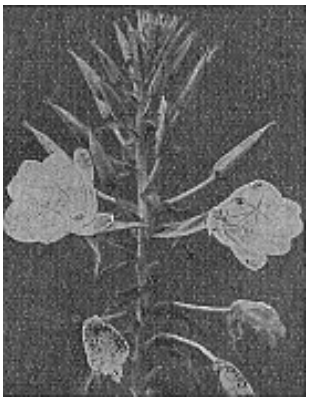
Informal after-dinner parties are useful methods of entertainment where accommodation is limited, and give opportunity for introducing people whom one is anxious should meet each other. In such cases the invitation may be by telephone or sent in a friendly note, asking the prospective guest to come in after dinner on such and such an evening.

Nothing elaborate in the way of refreshments is needed. Usually coffee is handed round as soon as the company is assembled, and liqueurs may be offered at the same time. Fruit, cakes and cocktails or other drinks may be offered during the course of the evening.

Entertainment during such an evening can take the form of cards, music, or merely conversation, according to the tastes and talents of the guests. If any of the guests can contribute items, a cabaret performance is devised, the room for dancing can be cleared except for chairs, small tables set round the walls, and the necessary piano.

For a more important musical evening a concert may be arranged either to introduce talent or for a charity. If for the latter purpose, the preliminary work involved in getting up a concert, includes some advertisement of the forthcoming event in the local newspapers, by the distribution of handbills among residents and for exhibition in shop-windows, arranging and numbering the seats, and providing tickets and programmes. *See* Bridge Party; Cocktail Party; Dinner; Amateur Theatricals.

EVENING PRIMROSE. Some of the evening primroses are perennial, but others are biennial. The latter perish after they have flowered, and must be raised from seed every year to ensure an annual display of bloom; the perennials live on from year to year. The common evening primrose, Oenothera biennis, of which the flowers do not open during the daytime, soon becomes a weed in gardens, for it sows itself freely. It is not nearly so attractive as some of the perennial kinds, although useful for odd corners and in the shrubbery.



Evening Primrose, the flowers of which are closed during the day and open in the evening.

The best of the perennials is Oenothera fruticosa or Fraseri; this is a splendid border plant, 18 inches to 24 inches high, which bears bright yellow flowers that are open during the daytime. Speciosa, 2 feet, has beautiful white flowers, and missouriensis, a trailing plant for the rock garden, has large yellow blooms. The new Oenothera trichocalyx, 2 feet high, with white flowers, blooms in summer from seeds sown in spring under glass.

The evening primroses suitable for planting in borders flourish in ordinary soil; missouriensis thrives best in well-drained sandy loam. The perennials can be propagated by division of the clumps in autumn or spring, or by sowing seeds out of doors or in boxes of soil in a frame in April-May.

There are several annual evening primroses, of which the most striking are taraxacifolia, blush, 6 to 8 inches high; rosea, rose colour, 6 to 8 inches; and bistorta Veitchii, yellow and crimson, 12 inches. The two first named are hardy annuals to sow out of doors in April; the last should be sown under glass in March.

EVERGREEN. The term is applied to the innumerable trees, shrubs and flowers which retain their leaves all the year round, instead of shedding them in the autumn, as deciduous or summer leafing shrubs do. With the exception of the holly, box, and some varieties of the oak, there are few evergreen native trees, but notable instances of other popular evergreens are to be found in the laurel, privet, ivy, and rhododendron. *See* Andromeda; Aspidistra; Bouvardia; Box; Butcher's Broom; Ceanothus; Ivy, etc.

EVERLASTING FLOWER. The so-called everlasting flowers are useful in the garden during the summer months and for room decoration in the autumn and winter. If they are required for use in winter they should be cut during dry weather before the blooms are fully expanded; after having been set out in a cool room to dry they should be bunched and hung, flowers downwards, indoors until required for vases.



Everlasting Flower. One of the everlasting flowers, Helichrysum, which flowers in summer and may be dried for winter decoration.

Those chiefly grown are hardy and half-hardy annuals—helichrysum, acroclinium and rhodanthe. Helichrysum is a hardy annual, and should be sown out of doors in early April where the plants are to grow; it reaches a height of 2 feet or more and bears large blooms in crimson, orange, yellow and other colours. Rhodanthe and acroclinium, with rose or white flowers, are of slender growth and reach a height of about 12 inches; they may be raised from seeds sown out of doors in April-May or under glass in March: they are often grown in pots for the summer decoration of the greenhouse.

EVERLASTING PEA. This is a useful climbing summer-flowering plant for covering a trellis, porch or other support. They are hardy, thrive in ordinary soil and reach a height of 6 to 8 feet. The best way of raising a stock is to sow seeds in a box of soil in a frame in spring or out of doors in April. The commonest kind, Lathyrus latifolius, bears rose-red flowers; the variety White Pearl is more attractive. Lathyrus grandiflorus has rose crimson flowers.

EWER. This name is given to a wide spouted jug made in earthenware and glass. The early ewers were used for holding water to pour over the hands after meals. These were usually of silver or other metal, and some were made with a basin to match. *See* Crockery; Cream Jug; Jug.

EXCHANGE: Of Goods. Many persons wish, instead of selling and buying, to exchange one article for which they have no use for one which they want. Furniture dealers, especially those who sell antique and second-hand goods, frequently take one article in payment or part payment for another. A popular way of bringing about an exchange is to advertise in one of the newspapers, say the "Daily Telegraph." The articles to be exchanged should be described as clearly as possible in the limited space available, and it should be stated when they can be seen.

EXECUTOR: His Duties. An executor is a person who is appointed by a will to see that it is carried out; on him devolves the duties of seeing that the testator's debts are paid, and his property disposed of as he has directed. It is well to appoint two executors in a will, for one may die before the testator or immediately after him, and before the duties have been completely carried out. If the estate is a small one, and can be wound up quickly, it is better to appoint two in the alternative, thus: "I appoint as executor of this my will John Smith, or if he dies before me or refuses to act then I appoint William Jones." It is best for a testator to nominate as executors people who are younger than himself.

An executor's first duty is to prove the will, either at Somerset House or at one of the local Probate Registries. It is wise to employ a solicitor to do this, and to pay the necessary death duties. The next duty is to collect the property.

All debts should be got in as promptly as possible for reasons which will be shown below. The first debts to be paid are the funeral and testamentary expenses incurred by the executor. Next the debts owing by the deceased in his lifetime should be paid; and after that, when all debts are discharged, the executor begins to pay legacies, and to distribute the property.

An executor should be diligent in collecting debts—that is, he should not delay so long that the debt becomes statute barred. Debts should be paid in the following order:

(1) Funeral expenses and expenses of proving will and getting in property.

(2) Debts preferred by special statutes.

(3) Rates and taxes and wages to certain servants; compensation due under Workmen's Compensation Act; contributions to Insurance Acts.

Next, the ordinary debts must be paid, but certain debts are deferred until all others have been met, e.g. money lent to wife by husband, or vice versa, for purpose of trade; money lent to deceased on terms that lender should receive a rate of interest varying with profits of deceased's business.

If the deceased left plenty of assets to pay all his debts, it does not matter in what order the executor pays them; but if there is not enough to go round, the executor should adhere strictly to the order given above.

As between the people to whom money or property has been left by the will, the executor often has to make a choice; he has to take some of the property to pay debts, thus leaving not enough to pay all the legatees. He must apply the assets towards payment of debts in this order:

(1) Property not disposed of by will, subject to a fund for pecuniary legacies.

(2) Property included in a residuary gift, subject to a fund as aforesaid.

(3) Property specifically appropriated for payment of debts.

(4) Property disposed of subject to a charge for payment of debts.

(5) Any fund for pecuniary legacies.

(6) Property specifically disposed of in will.

(7) Property appointed by will under a general power of appointment.

An executor is liable personally to the estate if he wilfully neglects to collect or realize the property. He is personally liable to a creditor if he admits assets by paying a debtor of an inferior class when that creditor is of a superior class. He may be liable if he personally promises a creditor to pay his debt; but the promise cannot be enforced unless it is in writing signed by the executor or his agent.

If the executor gives notice to creditors by means of advertisement in certain newspapers calling for claims, he is not liable for debts notified after that time.

Occasionally a legacy is bequeathed to someone who cannot be found, e.g. a relative who has emigrated, address unknown. In such a case the executor would be well advised to pay the money into the chancery division of the high court, and then await the claim. *See* Death; Estate Duty; Legacy; Will.

EXERCISE. A healthy child rejoices in exercising its muscles, and the more vigorously the better. Children who are cooped up in cramped and badly ventilated rooms are prone to develop rickets. Their bones become soft, bend easily, giving rise to mis-shapen chests, bandy legs and other bony deformities. A large number of girls, mostly amongst the poorer classes, show a faulty development, the reason being that they are very frequently kept indoors for household duties.

Games, therefore, are the natural right of the young, being necessary to their growth. If a child is indisposed for games by lack of bodily vigour, attention should be given to its health, and suitable gentle exercise should be selected, to lead gradually to something more strenuous. In adolescence games provide a safe means whereby a superabundance of energy may be expended. Apart from their usefulness in developing the body, games should be encouraged as a means of developing character and of enabling the child to come into easy relationship with his fellows.

Nor is exercise less necessary for those whose bodily development is complete. The sedentary worker who neglects exercise becomes stale, his vigour is diminished, he suffers from a lack of elasticity, and his digestion is apt to be sluggish. If he also lives well in the way of food and drink, these evils will be intensified and he may become obese or gouty, suffering from arterial disease or a combination of these, and break up comparatively early in life. Exercise improves the tone, the size, and the firmness of the muscles, strengthens the heart and lessens its work, increases the excretion of waste products by the lungs, the skin, the kidneys and the bowels, and so makes possible a free, untrammelled activity of all the body tissues.

Nothing can compensate wholly for the lack of exercise in the open air, but in the case of town dwellers whose opportunities in this respect are limited, an hour once or twice a week in a well-appointed gymnasium will be of the utmost value, or carefully chosen exercises may be done regularly at home in a well-ventilated bedroom. Exercises involving much strain should not be undertaken by those whose hearts are weak, or who are much older than 30.

Walking provides good exercise if one walks sufficiently fast, and more particularly if the walk is uphill; but as the value of exercise is largely enhanced by the extent to which interest is excited, the superior claims of golf are apparent, apart from the additional exercise to the arms. For the same reason any other suitable game should be played whenever it is at all possible to do so. *See* Beauty Culture; Breathing; Diet; Drill; Figure.

EXHAUST: From the Engine. This word is used for the waste steam or burnt gases ejected from an engine, and also for the exhaust piping. In internal combustion engines the waste gases are expelled through the exhaust valves and the exhaust port into the exhaust pipe. Most motor cycles are provided with a device known as an exhaust lifter, usually controlled from the left-hand side of the handlebars. This raises the exhaust valve when required, releases the compression of the engine and prevents firing.

The fumes from the exhaust of a petrol engine may contain the highly poisonous gas known as carbon monoxide, produced by imperfect combustion of petrol in the cylinders.

If the engine is allowed to run while the car is standing in the garage, the exhaust pipe must be connected to the outer air, and the building ventilated by opening doors and windows.

EXOPHTHALMIC GOITRE. Over-action of the thyroid gland, which is situated in the neck just below the Adam's apple, is the cause of a disease to which the name exophthalmic goitre has been given. It may be contrasted with myxoedema, which is due to under action of the same gland. Its chief characteristics are prominence of the eyeballs, enlargement of the thyroid gland, rapid heart action, and a continuous fine tremor. The disease is more common among women, and it is possible that worry or excitement may help to bring it on.

The symptoms are very gradual. The heart beat is quickened and may range between 100 and 120 instead of the normal 65 to 75. The action is abnormally forcible and the vessels in the neck, the pulses at the wrists and in front of the ears, etc., become readily visible. As a rule the patient loses flesh and becomes anaemic.

Everything should be done to secure mental as well as physical rest, and in the case of a town-dweller she should be sent if possible to live in the country for a time, avoiding excitement and getting plenty of fresh air and plain food. Ten hours' sleep is not too much in such cases. The drugs mostly given are iodine, arsenic, digitalis, belladonna, and the bromides. Attacks of diarrhoea and vomiting should at once be brought to the notice of the physician. The application of X-rays has proved a successful cure in many cases of exophthalmic goitre. In severe cases an operation is undertaken.

EXPECTORANT. A drug used to promote easier expulsion of expectoration from the air passages in disease by altering the character of the secretion or otherwise is termed an expectorant. Among these are sodium or potassium bicarbonate, ammonium chloride, ammonium carbonate, iodide of potassium, ipecacuanha, squills, volatile oils (e.g. camphor), balsams (e.g. compound-tincture of benzoin), and a variety of others. Some expectorants are depressant to the heart, e.g. ipecacuanha and antimony, and care has to be taken in giving them to the aged and debilitated, for whom stimulating substances like ammonium carbonate, ammoniacum, and camphor are preferable.

The following is a typical expectorant mixture such as might be prescribed in a case of chronic bronchitis. The dose is 2 tablespoonfuls every 4 hours:

Ammonium carbonate	30 grains
Wine of ipecacuanha	1½ drams
Infusion of senega	4 oz.
Water to make	8 oz.

EXPECTORATION or Sputum. Material coughed up or got rid of by spitting may come from the mouth, nose, throat, air passages, or lungs. A clear, sticky sputum, like white of egg, occurs in the early stages of bronchitis, pharyngitis, and of lung conditions such as phthisis and pneumonia. In chronic catarrhal conditions of the nose and throat greenish-grey, sticky

material is hawked up in "'clearing the throat," frequently stippled with black specks due to inhaled dust. A brownish or yellowish-red sticky sputum constitutes the rusty sputum of developed pneumonia.

Streaks of blood in the sputum may come from the mouth in spongy conditions of the gums, etc., the throat from adenoids, etc., or the air passages generally when inflamed. When in larger or smaller quantities of pure or almost pure blood, it is termed haemoptysis. The commonest cause is consumption. The b1ood is coughed up, it is bright red and is mixed with air, these circumstances distinguishing it from haematemesis, or blood from the stomach, which is vomited and is usually dark in colour and intermixed with food.

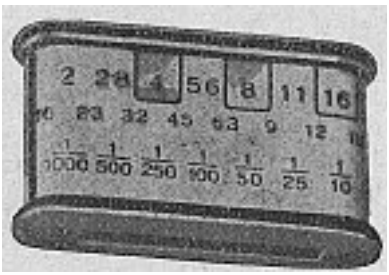
In diseases in which there is expectoration this should not be received in a handkerchief, otherwise it dries and is shaken off into the air, carrying with it the disease microbes. In cases of consumption a pocket spittoon or spitting bottle is always insisted on for this reason, but there are others than consumptives whose expectoration is dangerous, and it is their duty also to use a bottle and protect their neighbours. Within doors the sputum may be received in pieces of paper, which are immediately burnt, or if they are received in a receptacle this should contain some antiseptic solution, e.g. of lysol. *See* Bronchitis; Pneumonia, etc.

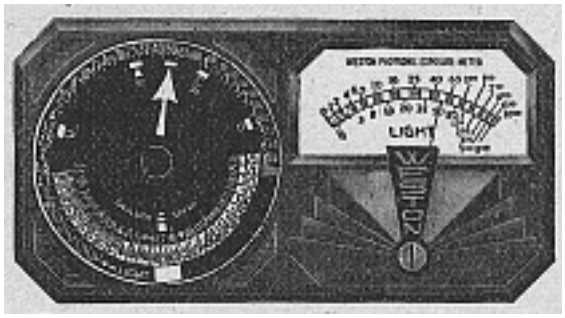
EXPOSURE: In Photography. Correct exposure is the key to success in all forms of photography and without it good results cannot possibly be obtained. The camera cannot be treated as an instrument in which only a button has to be pressed and the machine does the rest. The simple roll film camera with a lens of an aperture of f 8 or f 11 (U.S. numbers 4 or 8 or Kodak No. 1 for V.P.K.) will give satisfactory results for most subjects on sunny days in midsummer without any special consideration of exposure times, for it is designed to do this, but at other times of the year or on dull days and with certain kinds of subjects a knowledge of the conditions to be observed is absolutely essential.

There are four conditions which govern the exposure: The actinic, or photographic, value of the light; the sensitiveness, or speed, of the plate or film used; the kind of subject being photographed; the aperture, or speed, at which the lens works. Taking the last condition first, it will be assumed in this article that a lens working at an aperture of f 8 (as explained under F Numbers) is used. For a lens of f 11, such as is found on the ordinary V.P.K. and other cheap roll film cameras, all the calculations must be doubled.

The actinic value of the light varies very considerably according to weather conditions, time of day and time of year. It does not necessarily follow that because the light appears to be bright it is good in the photographic sense; for what has to be considered is not the appearance of the light to the eye, but its chemical action on the sensitive film. Some forms of light which are hardly perceptible to the eye have very definite action on the photographic plate. Again, winter sunshine, which may appear to be strong, is photographically weak, and even on an August day the light is not quite so strong in the afternoon as it is in the morning.

Small variations in the chemical strength of the light do not matter, because the latitude allowed by modern films permits exposures which may be two or three times the theoretically correct figure without impairing the result. In fact, for the amateur working with a roll film camera it may be broadly stated that the one thing he has to guard against is under-exposure; he is hardly likely in taking snapshots to over-expose.





Exposure. Left, a Leudi visual extinction meter, small and very light. Below, a Weston meter with Photronic photo-electric cell, for all cameras.

The second consideration, the speed of the plate or film used, is one that will give the amateur very little trouble if he will adopt the plan of finding the plate or film that suits his purpose best and sticking to it. Determining the speed of a plate is a very complex matter. For even different batches of the same plate will vary. Experienced workers in photography, therefore, find that the best results are obtained if they confine themselves, as far as possible, to one brand of plates or films whose speed they know.

As to the third consideration, the kind of subject that is photographed, the novice soon learns that a white object requires a shorter exposure than a dark one. He does not always recognize that darkness of colour is not the same as darkness in lighting, and that a white object poorly lighted may actually require a longer exposure than a dark object well lighted.

The most satisfactory method of calculating exposure is to use either an actinometer, a visual extinction, or a photo-electric meter. An actinometer makes use of a small piece of printing-out paper which is exposed to the light through an aperture. The time of darkening of the paper is taken as a measure of the light intensity, and is applied to the calculating device incorporated to find the exposure required.

In the case of the visual extinction meter, light reflected from the subject illuminates either one or a series of contrasted letters or figures. The eye views the field, and if one letter or figure is visible, part of the meter is rotated until this letter or figure is only just visible. The amount of rotation needed to reduce the

intensity of the light to this point is a measure of the intensity of light reflected from the subject, and the reading is applied to a calculator on the meter.

The photo-electric exposure meter measures light intensity by means of a light-sensitive cell, which generates an electric current whose strength is proportionate to the intensity of the light falling upon the cell. The current is passed through an extremely sensitive galvanometer, or micro-ammeter, which moves a pointer along a calibrated scale, the reading of which indicates the value of the light intensity.

The photo-electric exposure meter is more expensive than the other types, but is the most reliable of the various kinds of exposure meter. It can be used in all kinds of light, and is subject to smaller errors than most other meters in the determination of the light intensity.

Cameras with single speed shutters marked as working at 1/25th sec. usually give an exposure of about 1/15th to l/20th sec., which is about the longest exposure that can safely be given with the camera held in the hand if movement is not to show itself in the picture. Cheaper shutters marked as giving an exposure of 1/100th of a second generally give about 1/50th. These variations are all to the good, as they result in longer exposures.

Longer exposures can easily be given. Rest the camera on a fence, a gate post or the top of a chair, and by setting the shutter to "Bulb" give short-time exposures. Thus, with the shutter set at "Bulb" the release is pressed and let go again instantly. If this is done as quickly as possible without shaking the camera an exposure of about a ¼ sec. will have been given. For ½ sec. do the same with a perceptible pause between pressing the release and letting it go, or by pressing the release while the words "one, two" are said sharply. Doing the same while saying sharply "one, two, three, four" will give a 1 sec. exposure. *See* Developing; Snapshot; etc.

EXPRESS DELIVERY. Packages and letters can be sent from most post offices for express delivery by special messenger. The charge is 6d. for each mile or part of a mile, and a 1d. for each package in addition to the first up to a maximum of ten. Packages over 1 lb. in weight pay a further 3d. By this service live animals, liquids and loose cash can be sent and persons conducted to and from any given place. Packages may also be posted and then sent by special messenger at the charges mentioned from the post office to the address thereon.

On payment of 3d. to a servant of any of the chief railways, in addition to postage at the ordinary rate, letters not exceeding 2 oz. will be forwarded, and passed on from one company to another at a junction, by the next available train or steamship, to be called for at the station to which the letter is addressed, or to be transferred to the nearest letter-box for postal delivery. The letter may be taken to a passenger station of the railway company, or sent there by express delivery on week days. By the new "Railex" door-to-door system there is an inclusive charge of 2/6 for 2 oz. letters, or 3/- for letters between 2 oz. and 1 lb.

EXTRACT. Meat extracts are obtained from lean meat by various processes, which include the use of heat. They contain a very small amount of nutritive material, their chief, constituents being extractives, substances which result from the breaking down of proteins, and mineral salts. They act as stimulants and help to remove fatigue. They also improve appetite and digestion, so that other food which is taken at the same time proves of more use to the body. Meat extracts are useful flavouring agents. Extract is sold in bottles of various sizes, and, with hot water, soup or broth may be quickly prepared.

Malt extracts contain a large percentage of carbohydrates, which are readily dissolved and digested, and one also finds in them active diastase, the ferment which converts starch into sugar. Thus they provide an additional and suitable supply of carbohydrate, and also assist in the digestion of starchy food. *See* Beef Tea; Food, etc.

THE EYES AND THEIR CARE

Hints on the Preservation of the Eyesight

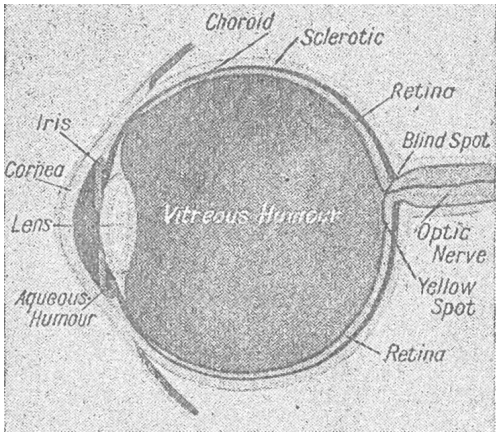
The subject of sight is dealt with in this Encyclopedia under a number of headings, e.g., Eyeglass; Sight Testing; Spectacles. See also the entries on Astigmatism; Blind; Cataract and other eye affections.

Of all the organs of the human body the eye is the most delicate in structure, the most susceptible of injury by disease, accident or overstrain, and any affliction of this organ calls for expert treatment at the earliest possible moment. In no case is this more essential than in ophthalmia of the newly-born, a disease which makes its appearance within a day or two after birth and is the cause of the great majority of cases of blindness. It is characterised by the discharge of pus from the eyes; any such discharge calls at once for skilled attention if total blindness is to be prevented.

Visual Defects in Children. During childhood various faults of vision, such as short-sight, long-sight, squint and astigmatism, may make their appearance, and parents and guardians should be on the alert to have the eyes of children examined at once if they observe any signs of visual defect. The child suffering from short-sight will hold objects which he wishes to see nearer to his eyes than is normal and cannot identify objects that are at a distance. The child who is long-sighted will complain of pains in the eyes and of headache when reading or writing, due to overstrain of those muscles by which the eyes are focussed on near objects. In all such cases glasses are essential.

Squint is most frequently due to over-strain of the focussing muscles, and is a sign either of weakness of these muscles or of longsightedness. Astigmatism is generally caused by irregularity in the curvature of the front of the eyeball, and demands the provision of specially ground glasses. Its presence may be suspected

where the subject complains of eyestrain or of headache, especially after a visit to a kinema, theatre, etc.



Eye. Sectional diagram showing the anatomy of the organ.

Eye Changes in the Elderly. After middle-age difficulty may be experienced in viewing objects clearly which are near at hand. This is due to hardening of the internal structures of the eye and weakness of the muscles of focussing, and assistance must be rendered by glasses, which will require to be strengthened as the disability increases with advancing years. If it is found necessary to obtain stronger glasses more frequently than every five years, and especially if at night-time street lights or candles are seen surrounded by rainbow-coloured rings, it is possible that the subject is suffering from a dangerous disease known as glaucoma, which, even in its chronic form, demands immediate surgical treatment. When acute, glaucoma is ushered in with intense pain in the eyeball, frequently radiating around the eye, and sometimes accompanied by headache and vomiting. Its onset, therefore, is liable to be mistaken for a bilious attack, and valuable time is wasted in securing treatment. In all cases where glasses are required, they should only be obtained on the prescription of a qualified oculist.

In order to avoid the occurrence or aggravation of visual defects, it is of importance that all close work should be done in a good light. Excessive light is equally harmful. In reading or writing, a position should be adopted in which the source of light is, if possible, behind and from the left. This is particularly important at the school age. Undue stooping when writing should be avoided as tending to increase tension within the eyeballs, and therefore to aggravate any existing, predisposition towards short sight. For the same reason tight neckwear and excessive physical exercises may be harmful. Reading in bed is injurious, and children should never indulge in it.

Diseases and Injuries. A stye is a small abscess which forms at the root of an eyelash. It should be treated by pulling out the eyelash involved, and by bathing the eye frequently with a hot lotion made by dissolving a teaspoonful of common salt in a pint of water which has been boiled. This lotion is also useful for all simple inflammatory diseases of the eyelids. Chronic inflammation, however, demands drastic treatment by an oculist, as the condition may be due to trachoma, a condition which is dangerous alike to the patient, owing to the possibility of blindness supervening, as well as to others who may become infected.

Soiled towels in public lavatories should never be used to dry the eyes, as the infection of trachoma, as well as of many other contagious diseases, may readily be conveyed by such means.

To prevent the sealing of the lids which is so frequent in inflamed eyes, and does harm by imprisoning the discharges, the eyes should be well smeared at bedtime with a salve or ointment. Useful ointments are 10 grains of boracic acid powder in 1 oz. of soft paraffin or vaseline, and equal parts of yellow oxide of mercury ointment and vaseline. A little glass rod with a rounded end is a convenient instrument to use for applying. The lower eyelid is drawn down and some ointment, picked up on the end of the rod, is put on its inner surface. The patient closes his eye, and by gently rubbing over the surface of the lids the ointment is spread over the eyeball.

A lotion or collyrium (q.v.) should always be used comfortably warm. It may be applied by soaking a piece of cotton wool in the lotion and squeezing this out into the eye, or by means of an eyebath *(see* below).

Foreign bodies in the eyes may usually be removed by brushing with a camel-hair pencil, or the moistened corner of a pocket handkerchief. If simple measures fail, instil a drop of castor oil into the eye, place a soft pad, as of cotton wool, over the closed eyelids and secure this in position by applying a bandage lightly. A doctor should be consulted without delay.

Wounds of the eyeball are extremely dangerous, no matter how trivial they may appear, as they may be productive of blindness. A blow on the eye, as in boxing, may cause serious internal injury even though no external signs are visible. It is of importance to remember that failing vision may be the first symptom of grave diseases, such, for example, as Bright's disease or diabetes.

Hygienic Measures. When in perfect health, the whites of the eyes should be of a clear bluish-white. Redness shows that the eye is suffering from a slight cold or a strain. Give the eyes a warm boric lotion bath three or four times a day, using a teaspoonful of boric acid powder to every ½ pint of hot water. To remove a yellowish tint from the whites of the eyes, drink a glass of hot water to which the unsweetened juice of a lemon has been added. In all treatment with bandages and pads, medicated cotton wool and butter muslin are the most hygienic materials to use, since they can be thrown away. Sponges should never be used unless they are certain to be destroyed immediately afterwards.

People who write or read a great deal often suffer

from eye strain. This may be relieved by bathing the eyes in a solution of salt and water, a teaspoonful of salt and a quart of water. Pure cold water is in" itself a good eye wash, or a weak solution of zinc sulphate will be made up by any chemist and is very good for tired eyes. After extra fatigue a strip of lint, moistened with water and laid on each eye and kept in place by a bandage for about ten minutes, is very helpful.

An eyebath is a convenient appliance for washing the eyes. This is a little vessel of glass or some other material, with its edge shaped to fit into the socket of the eye. It is filled with the lotion and the patient bends forward the head and applies the edge of the bath firmly round the eye. He then throws his head back and opens the eye widely. The lotion is kept in contact with the eye for a minute or two. The cleansing may be facilitated by opening and closing the eye several times while the bath is in position.

EYEBROW. If eyebrows are too thin a little vaseline or olive oil can be applied nightly with a small eyebrow brush, which is like a minute toothbrush in form.

In applying any strengthening lotion care must be taken not to encourage the growth of hairs between the eyebrows. Some eyebrows have a tendency to meet over the nose. The use of tweezers keeps the line of the brows in good trim, unless the hairs are abnormally coarse, when electrolysis may be employed by a good operator. Brushing the eyebrows with a clean brush lightly smeared with a little brilliantine each morning tends to darken them and give them a silky appearance. It is possible to have the eyebrows and lashes tinted in any desired shade of brown or black. *See* Beauty Culture; Face.

EYEGLASS. Eyeglasses are usually worn by persons who do not require glasses constantly, but only for a particular purpose or for part of the day. For such persons eyeglasses are perhaps more suitable than spectacles.

Excluding the single eyeglass, or monocle, there is not a great deal of variety in the eyeglasses worn by men and women in ordinary life. There are slight variations in the nature and strength of the spring that keeps the glasses in position on the nose and in the shape of the bridge that unites the two glasses; there are glasses with rims and glasses without, and there are glasses that fold up and glasses that do not, but that is practically all. The frames, however, vary in quality and material, ranging from the cheaper ones of nickel or steel to the expensive ones of solid gold. Silver is rarely used for these frames, but rolled gold is frequently seen. Some persons have eyeglasses with horn or tortoiseshell frames. Some wear a cord to attach the eyeglass to some part of the person; others prefer to carry them in a case.

The eyeglass has usually a rim of metal round the glass proper, but many persons wear glasses without rims, and for these certain advantages are claimed. Their weight, it is said, is about one half that of ordinary eyeglasses; they are, when properly fitted, almost invisible, and they have no rims to interfere with the vision if they get slightly out of place.

The Frames. The frames of eyeglasses are often made in other material than metal, and those fashioned of tortoiseshell or horn are not easily repaired. When the nature of the damage permits, the fracture can be mended with Canada balsam, using this as a cement. The parts are held together with fine binding wire, or with a strong paper-clip of the John Bull type, and left for 24 hours to set hard.

A common fault with eyeglasses is for the frames to become distorted and forced out of line. In bending the parts and bringing them into place, keep the fingers of each hand close together with the bent part of the frame between them, thus localizing the strain. If a small pair of pliers is used, remember not to exert too much pressure and smash the glasses. When viewed in plan the lenses should be in line, and likewise when viewed from the front. The plaquets, or nose grips, are often faced with cork, and this can be cleaned with petrol, or new pieces cut from a good quality bottle cork and cemented in place. See that the plaquets are in line and at equal angles to a vertical centre line.

Eyeglasses with astigmatic clips, or those in which a spring draws the two parts together, will benefit by cleansing with petrol, and the spring be retensioned by drawing it through the fingers and thus increasing its length. Replacement parts are generally obtainable from manufacturing opticians. *See* Sight; Spectacles.

EYELASH. The beauty of the eye depends to a great extent upon the eyelashes. They should be as dark or a shade or two darker than the hair. They can be painted at night with castor oil applied with a camel's hair brush. If the eyelashes are inclined to be very straight they should be gently brushed upward over an orange stick laid along the edge of the upper eyelid. The use of a slightly astringent eye lotion containing witch hazel tightens the eyelids and prevents fall of the lashes.

EYELET. An eyelet is a small round hole in cloth, sailcloth, etc., which is worked like a buttonhole for the passage of a lace, ring or rope. In needlework it is best known as the open hole which is used in various forms of embroidery for working berries and similar small round parts of the design. *See* Embroidery; Stiletto.

FACE: CONTOUR AND SKIN TREATMENT

The Use of Simple Cosmetics and Massage

For related information see the articles Beauty Culture; Diet; Hair; Neck; Skin. Consult also the entries Powder; Soap, etc.

A good facial contour ranks next to a fine complexion in creating a general impression of beauty. The skin is of first importance, because no matter how handsome the features they will not be admired if

blemished by surface defects. Correct diet and exercise are essential factors, but local treatments are also integral to the preservation of a fine skin. It is quite easy to call to mind many healthy women and girls who do not possess beautiful complexions for the simple reason that they take no care of them.

On the other hand, the athletic movement of the past twenty years has undoubtedly improved the skin, eyes and hair of the sex in general. The sports girl breathes more deeply, and so possesses a bigger supply of oxygen in her blood, expressed in greater physical beauty, owing to her better circulation. This combined with saner views on diet and fresh air has also lessened digestive troubles and constipation which have a directly adverse effect on the facial appearance.

A frequent cause of a sallow, wilted look is simply the neglect of drinking sufficient water. The normal body requires three or four pints a day, some of which is taken in food. A glassful should be drunk at night and in the morning. A free use of water combined with plenty of fruit, green vegetables, a nourishing diet, fresh air and the regular performance of breathing exercises will remove premature hollows under the eyes and round any unbecoming facial angles.

Facial Contour. Superfluous flesh in a youthful face will often respond quickly to correct diet and massage, when the desire to reduce is strong enough to make certain sacrifices, such as cutting down sweets, pastries, and not giving way to laziness. The muscles which preserve the contour of the face must be kept healthy because on their vitality mature good looks depend.

The upright carriage of the head has a good effect on these muscles. Exercises to assist in preserving the contour of the jaw are given in the entry on Neck. The pursing of the lips as if for whistling, when exhaling during breathing exercises, smoothes out lines from nostrils to the corners of the mouth and helps to correct a sagging tendency towards the points of the jaw. A simple little exercise which wards off a double chin is to protrude the lower lip and blow as if trying to blow away something from the tip of the nose.

The following hints are also useful for the preservation of the contour of the chin, the most important line of the face. After applying a skin cream, smartly pat along under the chin with the back of the hand (or a rubber patter) for about two minutes to stimulate the muscles. After washing dab an astringent lotion composed of one part of toilet vinegar to two of rosewater, under the chin. A daily treatment which is said to remove a double chin is to use an emollient cream and an astringent on alternate days with a chin strap which is worn for fifteen minutes. Soak a pad of cotton wool in the astringent and after kneading and patting the muscles, place this under the chin and keep it in position with the strap. The next day massage with a skin-food and wear the strap for the same length of time.

Astringents and Creams. The face should always be thoroughly cleansed before applying an astringent or massage. A good method is to squeeze a pad of cotton wool out of cold water, sprinkle it with a lotion composed of 2 oz. extract of witch hazel and 10 oz. rose water, and then spread over it a cleansing cream, and with upward strokes of the pad thoroughly wash the face and neck. A pleasant cream for this purpose is made as follows:

Take ½ oz. each of white wax and spermaceti and 4 oz. white vaseline; melt together and pour into a heated bowl. Very gradually add 3 oz. orange flower water and 1 oz. witch hazel, stirring all the time, and continue stirring until the emulsion is cold.

This way of cleansing the face is satisfactory during the day, after a journey, or exposure to wind and sun, or when the complexion is intolerant of soap and water. It may be used at night before an astringent or if any makeup has been applied to the skin during the day. The value of an astringent is that it braces the skin by closing relaxed pores, and it is essential that any foreign surface matter should be first removed. Nearly every skin benefits by washing daily with soap and water, massaging the lather over the face with both hands. A good rubbing with a turkish towel across the back of the neck and behind the ears stimulates the circulation after the final cold sponge in the morning.

There are many degrees of astringents, and discretion must be used in choice for the individual skin. *(See* Complexion.) Sponging in the morning with cold water to which a few drops of simple tincture of benzoin have been added is sufficient for the fresh complexion. The use of a complexion milk, after washing, containing benzoin and cucumber is suitable to most skins. It is not worth the trouble of procuring the many ingredients which go to the making up of these milks, when excellent preparations are on the market at a small cost.

For a Relaxed Skin

If ½ oz. simple tincture benzoin is added to the 2 oz. witch hazel extract and the 10 oz. rosewater this makes an excellent mild astringent for dabbing on the face with cotton wool, and also for tired eyelids if a pad of cotton wool is squeezed out of cold water, soaked in the astringent, and laid on each eyelid for 20 minutes during a short rest. Should the facial condition be really flabby a stronger astringent is composed of 2 oz. toilet vinegar to 4 oz. rosewater. This can be used at night and an emollient applied afterwards to prevent undue dryness of the skin. The patting movements with the pad of cotton wool moistened with an astringent stimulate the circulation and help the removal of waste matter before closing the pores. This process tones up the skin.

Lanolin is the basis of many so-called "skin foods." An inexpensive but satisfactory cream is made by melting 2 oz. hydrous lanolin with 2 oz. white vaseline and stirring in 1 oz. each of olive and almond oils, and 2 dr. each boracic powder and zinc oleate. For anyone afraid that lanolin will encourage superfluous hair (used in such proportion it is quite unlikely to do so) a

cream with a casein basis may be used. Casein is prepared from the albuminoid matter of milk, and a simple emollient is composed of 3 oz. casein, 6 dr. boracic acid, 3 dr. cocoa butter. Occasional massage with olive oil may also be necessary to counteract dryness. This oil is soothing for treating, temporary conditions of dry skin caused by exposure to wind and sun.

For a sunburnt skin relief can be obtained by a piece of lint saturated in warm water to which a few drops of cloudy ammonia have been added, care being taken to keep the eyes closed while holding the lint to the scorched skin. To remove tan a mixture made of two parts peroxide of hydrogen, one part lemon juice, and one part rosewater can be applied to the face, after using the cleansing cream, and allowed to dry on. If this treatment should be too drastic at first, dilute the mixture with more rosewater. Freckles, which are pigmentary discolorations of the skin, are not unsightly unless they are too numerous and deep in colour. They may be hidden, and to some extent the rays of the sun may be counteracted by the use of a calamine lotion and face powder.

The formula for calamine lotion is as follows: Prepared calamin, 6 dr.; powdered oxide of zinc, 2 dr.; glycerin, 1½ dr.; rectified spirit of wine, 1½ oz.; elderflower water to make the lotion, up to 8 oz. This lotion deposits a fine powder. To keep it on the face of a child a soft muslin mask is necessary.

The following ointment may be rubbed sparingly in at night, but should not be used for children. It produces a peeling of the skin which usually leads to the disappearance of the freckles. Mercury perchloride, 1 gr.; powdered starch, 2 dr.; powdered oxide of zinc, 2 dr.; soft paraffin, 4 dr.

The treatment for blackheads is described under that heading. The application of calamine lotion, after sponging the affected area with hot water, is useful for both this unhealthy state of the pores and for a spotty condition of the face.

Facial Packs. From earliest days of beauty culture, facial masks or packs have been used. These are said to embody cleansing and astringent properties. Special mud and clay packs are variously recommended for clearing the skin and eliminating acidity. A simple and efficacious pack is made by placing a tablespoonful of fuller's earth in a cup, and mixing with it sufficient rosewater and witch hazel lotion to make a thin paste. Oatmeal may be used as a pack mixed with buttermilk, which possesses whitening properties when it is applied to the skin.

A facial mask which bleaches is made with almond meal mixed to a paste with the sunburn lotion containing peroxide, lemon juice and rosewater. Another pack is of half a cupful of cooked oatmeal into which 2 tablespoonfuls of milk and one of glycerin have been thoroughly stirred. Yet another is of egg. The beaten white is first applied with a camel-hair brush and allowed to dry on the face. A second painting with the white is followed, when this is thoroughly dry, with the application of the beaten yolk. This egg mask and the other packs described are left on for an hour and then washed off with pure soap and warm water. Afterwards, a light facial massage with an emollient should be given. A thin muslin mask cut to the shape of the face with eye-holes and tied on with ribbons is often used to keep these applications on the skin.

Helpful Massage. Some women are afraid of facial massage as they think it stretches the skin. This is only the case if wrongly or too hurriedly applied. All four movements, stroking, friction, pétrissage and tapotement can be used with advantage. The first starts the treatment with firm upward strokes when using the cleansing cream. Then, having wiped this off with an absorbent tissue, an emollient cream is applied and light friction given with the cushion part of the finger-tips, working the cream with circular spiral movements over the face. Facial massage should have an upward and outward tendency to correct the droop of the muscles. Then with the wrist held loosely the percussing movement already described is performed with the back of the hand under the chin. Next, more cream is applied, and the chin and cheeks are lightly pinched with the cushions of the finger-tips. Then, with fingers placed on the cheekbones, the thumbs meeting under the chin should stroke upwards to meet the fingers with a firm pressure, returning lightly under the chin. Repeat this movement for two minutes. Next, stroke the finger tips from the point of the jaw past the corners of the mouth to the nose and very lightly across the closed eyelids to the roots of the hair and across the forehead.

Lines should be followed and not rubbed across. Should there be a vertical furrow between the brows, it may be stroked gently upwards. The cream must be very lightly patted in round the eyes with the third finger, as the slightest rubbing will stretch the sensitive skin there. After this the massage cream may be wiped off. If the massage is performed at night a little emollient may be left on round the eyes and along any deep lines; if during the daytime, the skin may be toned with a mild astringent before powdering.

FACEACHE. Pain occurs in the face in inflammatory and suppurative conditions, e.g. dermatitis, gumboil, mumps, etc., and the cause of the pain is indicated by the redness and swelling which are also present. In the absence of such plain indications, an explanation for the pain should be sought for in disease affecting the teeth, eyes, nose and the cavities leading from it, the ear, etc., and in the general state of health of the patient, as anaemia, constipation, gout, hysteria, rheumatism, and other disorders frequently underlie the occurrence of pain. *See* Neuralgia; Toothache.

FACE PLATE. A face plate is a contrivance used on a turning lathe as a means of mounting work to be turned. It comprises a circular disk, generally of cast iron, with a projecting boss at the back. A hole is

drilled through the centre and screwed to correspond with the size of the screw thread on the mandrel. The plate is, as a rule, provided with holes or slots through which bolts are passed, which, in conjunction with clamp plates, bolts, and nuts, are used to fasten the work to the face plate. *See* Chuck; Lathe.



Face Plate. Contrivance invaluable to the metal worker for mounting work to be turned.

FACING: In Dressmaking. This is the name given to a strip of material laid along the edge of a garment, either on the wrong side, for neatening and strengthening, when it is sometimes termed a "false hem," or else on the right side, as an ornamentation, this often being of a contrasting material. The name is also applied to the top layer of such portions of a garment as are made of double material, i.e. the collar and cuffs.

As regards the cutting of facings, the rule for the first mentioned type is that, the strip can be cut on the straight if the edge to which it is to be applied is straight. A curled or rounded edge, however, is either faced with a strip cut on the cross, which can be pulled to shape, or else with a strip cut to the exact shape of the garment, and of the same way of the grain, these shaped pieces always being used for the facings laid inside the front edges of a coat, and also for the top layers of collars and cuffs, etc. One way of attaching a facing of the strip type is to set it over the garment, with the right side downwards, and to stitch it on just within the top edge; then to turn the strip over to the wrong side, and to hem the unattached edge down.

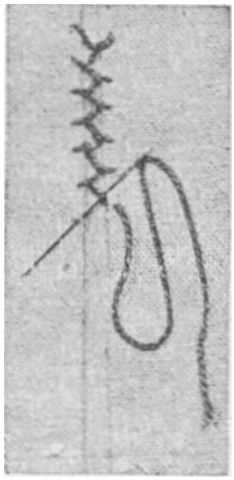
Another plan employed is to turn in the edges of the garment, set the facing over it, turn in the facing edges and hem or slip stitch down. When attaching a coat from facing, the inner edge is left detached.

FAGGOT: In Cooking. This is tht name given to a preparation made from calf's liver, or the inferior parts of a sheep, such as the liver, lights, pluck, and heart.

To make faggots from the intestines of a sheep, procure the liver, lights, pluck, heart and sweetbread and some of the skin. These must be well washed, put in a saucepan with cold water poured over them, brought to the boil and simmered gently for about 15 min. Add salt and pepper and pour off the liquid. Boil an onion in a little water and chop it. Chop the liver, lights, etc., and pound them well with the onion. Then add a sprinkling of mixed herbs and a pinch of nutmeg, and stir in sufficient breadcrumbs to make a firm paste.

Mould the mixture into squares and wrap each square in a piece of skin. Place them in a baking-tin that has been well greased, and leave it in a moderate oven until they are a pale brown. Make a gravy to serve with the faggots from the liquid in which they are boiled. Add pepper and salt, and thicken with a tablespoonful of flour made into a paste with a little of the cold liquid. Bring it to the boil and add a little caramel or gravy colouring if necessary.

FAGGOTING: The Trimming. This is sometimes used for beading to make an open seam for a dress or underwear. A slightly different variety of faggot stitch is used in drawn-thread work. The two edges to be joined should be sewn to stiff paper or toile cirée, about ¼ in. apart. The tacking threads should be about ¼ in. in from the edge of the hems to allow room for working the stitch under them.



Faggoting. An example of this useful trimming.

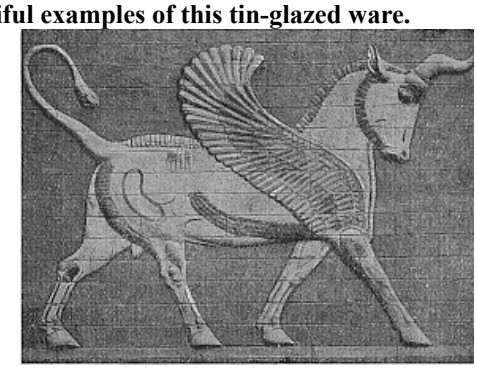
The following plan will keep the stitches even. Place a ruler along the edge of one hem, and at every ¼ in. mark put a dot on the material with a lead pencil. Repeat this operation on the opposite hem, but let the first dot come half-way between the first and second dot of the opposite edge, then the other dots will follow in order. To work the faggoting, join the thread on the wrong side of the hem at the top left-hand corner, holding the work so that the seam is in a perpendicular line before you, the stitching proceeding downwards. Bring the needle up from the underside of the hem on the opposite side, through the first dot.

Now put the needle under the stitch just made, which lies across the opening between the two hems; put the needle under the opposite hem and bring it through at the dot. It is important that the needle should be put down behind the thread last made so that the stitch comes under it. The illustration shows this position. Repeat this operation down the whole seam, then cut the tackings and take away the paper. *See* Drawn Thread Work.

FAHRENHEIT. This is one of the two chief ways of measuring heat by a thermometer. On a Fahrenheit thermometer the distance from the freezing-point of water to the boiling-point is 180°. The freezing-point is marked 32° and the boiling-point 212°. *See* Centigrade; Thermometer.

FAIENCE. This name is applied to various kinds of earthenware pottery and tiles having a highly glazed or emmelled surface. The word comes from the name of the Italian town Faenza, which made a speciality of this pottery from the time of the Renaissance. The art of the Moorish potters who established themselves in

Spain and left, among other examples of their skill, the tiles of the palace at Seville, spread to Sicily, and from there prepared the way for the Italian masters of majolica faience. Luca della Robbia is the best known of these. In the 15th century he created the most beautiful examples of this tin-glazed ware.



Faience. Persian bas-relief in polychrome faience brick, approximately of the period of Darius (500 B.C.)

Damascus enamelled earthenware also is believed to have helped to inspire ceramic art in Europe, as it was largely imported during the 15th century. Holland made the delft ware which was a compromise between majolica and Chinese porcelain, its methods being taken from the former and its designs from the latter. In 1676 a Dutch potter settled at Lambeth and started delft faience ware in England. Some varieties of Josiah Wedgwood's ware are styled English faience.

Germany developed faience methods for stove tiles and beer tankards, while in France the best known faience was the blue Rouen ware developed afterwards at Moustiers in a variety of colours. Enamelled brickwork was used in the days of Darius, and was the forerunner of the splendid glazed tile decoration which is extensively employed in Persian architecture.

Modern fabrics of Doulton, Minton and Ault are among those classed as faience, also some makes of Japanese pottery. The decorative effect may be in form, the beauty of monochrome glaze, as seen in certain tiles, or through polychrome designs heightened by applied reliefs. Many modern reproductions of majolica are good, but others tend to be crude in ornament and colour.

For this reason pieces which bear the sign manual of creative artists, or, as in the case of Della Robbia reproductions, aim at preserving the best traditions of the past, may be sought for as satisfactory notes of decoration in a sitting room. Sometimes one may rejoice in the possession of pieces that ought to be safeguarded, such as a fine Satsuma vase, a Rhineland tankard, a Leeds bowl, and even a piece of Valencia lustreware or Urbino majolica. *See* Delft; Lambeth Ware; Majolica; Pottery; Terra Cotta; Tiles.

FAILLE. Heavy taffeta woven with a pronounced rib is sold as faille. It also makes the most serviceable of ribbons, and is more hard-wearing than ordinary taffeta.

FAINTING: How to Treat. The cause of fainting is a deficiency of blood in the brain, which produces a temporary loss of consciousness. The fainting fit lasts usually for less than 1 min., but may be prolonged when it follows severe loss of blood or disease of the heart. In people predisposed to fainting any sudden strong emotion may tend to bring on a fit. A blow on the abdomen or on the head, intense internal pain, standing up quickly from a sitting posture, or getting suddenly out of a hot bath may cause fainting, especially if the heart is weak.

When one feels faint one should get into the fresh air or close to an open window and lie down or sit with the head bent forward between the knees. A few sips of cold water or a little spirits or sal volatile in water will assist recovery. If a person faints, lay him on his back with the head low, loosen the clothing about the neck, chest and waist, and let him lie still until he recovers. He should have as much fresh air as possible, and when necessary may be carried into the open air, the head being kept low.

Recovery can be helped by the following measures: Sprinkle the hands and face freely with cold water. Gently slap the face and hands with a soft, wet cloth. Put a bottle of smelling-salts or eau-de-Cologne to the nose. After recovery the person should rest lying down for a few minutes. In severe cases the legs should be raised well above the body and massaged in the direction of the heart. If breathing is not resumed, artificial respiration (q.v.) should be carried out. *See* Dizziness.

FAIRY RING. This popular and superstitious name is given to rings of toadstool-like fungi which establish themselves in grass, and sometimes assume considerable dimensions. The grass in and around the rings is generally of luxuriant growth, because it benefits by the nitrogenous matter in the decaying fungi. A fairy ring can be exterminated by watering it with a solution of sulphate of iron or copper, 1 lb. in 3 gallons of water. Afterwards, a little fresh soil may be applied and grass seed sown in spring or September to cover the bare spot. *See* Fungicide.

FAIRY ROSE. This is a dainty dwarf form of the Polyantha type of rose, compact in habit, with elegant leaves, and bearing bunches of pretty blossoms. It is suitable for pot culture, as it does not grow more than 1 ft. high. Plants raised from seed generally flower three months after sowing. If grown outdoors they demand well-drained soil in a sunny position. *See* Rose.

FALSE ACACIA. The name of false acacia is given to Robinia pseudacacia, a familiar tree with pinnate leaves and drooping clusters of white, pealike flowers. It does well in town gardens.

FALSE HEM. This is a strip of material sewn at the extreme edge of the part which requires additional length, turned over to the wrong side and hemmed at the required depth. In cases where there is not enough

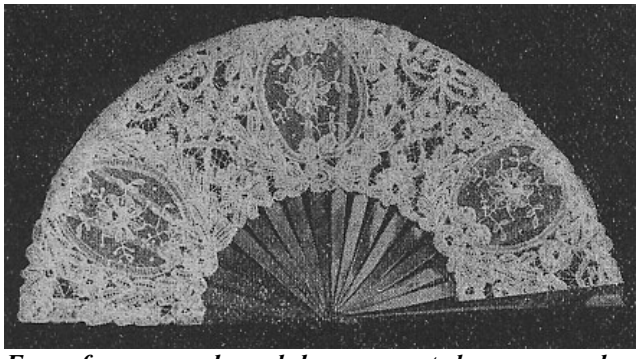
material to allow for a deep hem to be turned up, a false hem can be added of sateen or any material the same colour as the garment itself, taking care that the facing does not show on the right side.

A double hem can be made by folding a piece of the same material over and attaching it to the edge of the garment, covering the join with a trimming or fancy stitching. In the case of a thin material the false hem can be joined to the garment by means of faggot stitching. *See* Faggoting; Hem.

FAMILY COACH. Family coach is an old-fashioned game which is popular among small children. The players sit round the room and each chooses some part of the coach to represent. Thus one will be the box, another the lamps, another the wheels, and so on. If there are a great many players, each part may be taken by two or three children.

Somebody tells a story about the journeyings of the coach and its adventures on the road, mentioning the various parts in the course of the narrative. As each part is mentioned, the child who represents it has to get up and turn round, and when the coach itself is mentioned the whole party has to do the same. Any player failing to respond to his or her name in the story has to pay a forfeit, which is redeemed at the end of this amusing game in the usual manner.

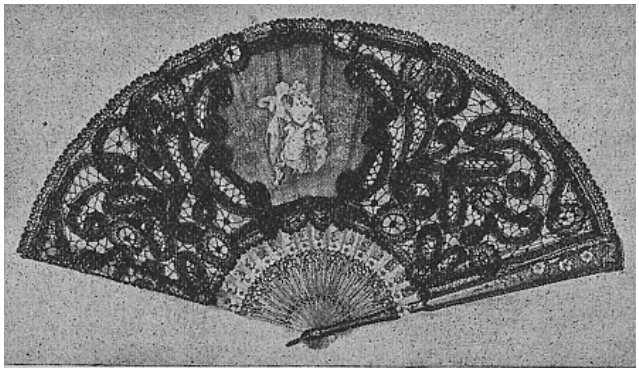
FAN: Uses and Ornament. Fans are of two distinct types, the folding and the non-folding. The non-folding kind, in use with evening dresses, consists of one or more plumes. The stick or handle may be of tortoiseshell or mother-of-pearl, or of composition to imitate either of these, of jade, amber or coral.



Fan of cream coloured lace, mounted on an amber frame (Courtesy of Selfridge & Co., Ltd.)

The folding fan was invented by the Japanese, and is said to have been suggested by a bat's wing. From Japan it spread to China and thence to Italy, and was introduced into France by Catherine de Medici in the 16th century. The non-folding fan was inspired by the palm leaf, and dried palm leaves are still used for the cheapest kind of oriental fan. The earliest known fans were of this straight shape, and are recorded in stone on the walls of an Egyptian tomb at Thebes, where a Pharaoh of the 18th dynasty is surrounded by fan bearers.

Spanish fans have the advantage of expanding from right or left, and are most usual in black lace with black bog oak carved mounts. Beautiful fans, painted, feather, or lace, still come from France. Interesting Chinese and Japanese fans can sometimes be picked up in curio shops. They may be made entirely of carved ivory, tortoiseshell or wood, the blades being strung together with coloured ribbons, or of folded, painted silk.



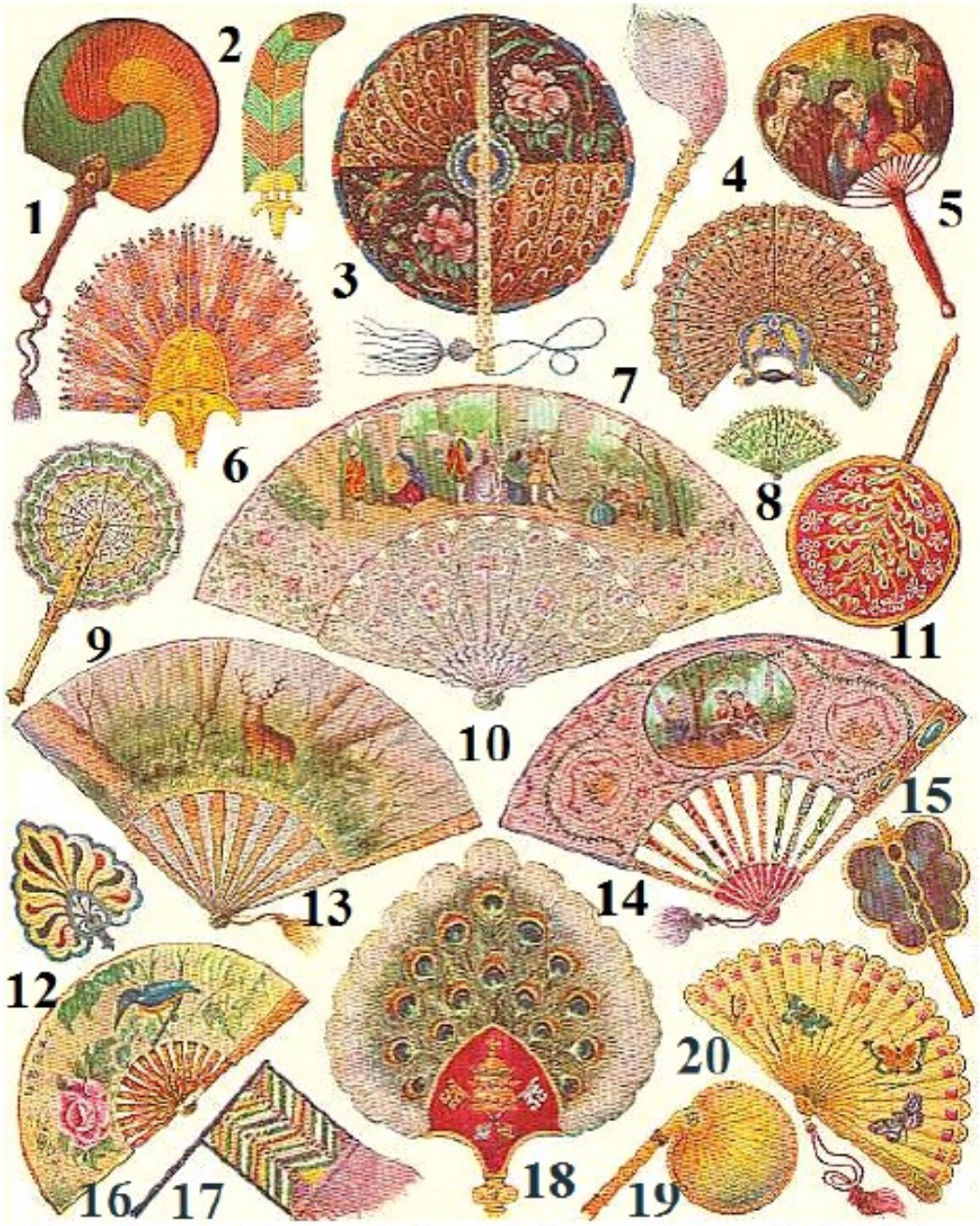
Fan. Black lace fan, with painted centre in the Watteau style.

The principle of Japanese fan painting is worth noting, because it has inspired the most successful designers of all nations. As the fan is invented for cooling purposes, patterns should be light and airy. The Japanese carry out this idea often by suggesting flowers, rushes, or branches of shrubs waving in the breeze, with, birds, butterflies or fish introduced to balance the design. These Japanese designs can be copied successfully by an amateur on a plain silk or gauze fan. Quite a success has been achieved by a straight Japanese fan, shield-like in shape, gold designed and varnished with red lacquer, handsome tassels depending from its stick; this is carried by the wearer of a black evening dress.

A charming idea from an old French fan is a centre medallion of pansies bordered with a ribbon knotted at the top and festooning to border a smaller medallion on either side containing the monograms of giver and receiver. Under the centre medallion the words "Thoughts of you" are painted. The three medallions connected by some kind of light ornamentation is a favourite design in fan painting. they can be placed to suit the arc of the fan, and filled with landscapes, classical figures or heads after the style of cameos.

If the fan is to be painted, the fabric must be painted before it is made up. It must be cut to the desired size, leaving a good margin for turning in. Stencil colours suitable for painting on silk, georgette or gauze should be used. If a pale coloured silk is chosen, the design looks very well in liquid Mandarin inks applied with a fine brush. The design must be carefully drawn on the silk before painting. Further inspirations for designs may be obtained from looking at the notable collection of beautiful 18th century fans, to be seen at South Kensington Museum. Designs painted on these fans were the work of Watteau and other genre painters. *See* Stencilling.

FANS: RARE AND HISTORICAL SPECIMENS OF INTEREST TO THE CONNOISSEUR



1. Korean fan. 2. Ancient Egyptian fan. 3. Chinese feather fan. 4. Indian fly fan. 5. Japanese water fan. 6. Ancient Egyptian state fan. 7. Indian hand fan of sandal-wood. 8. French Merveilleuse fan. 9. Flabellum of Tournus Abbey, France. 10 Italian painted fan (18th century]. 11. Cingalese state fan. 12. Ancient Greek fan. 13. French fan with a scene after Rosa Bonheur (19th century). 14. English fan (18th century). 15. Japanese war fan. 16. Chinese kingfisher fan. 17. Modern Sudanese fan. 18. Papal flabellum. 19. Burmese regalia fan. 20. Japanese Court lady's fan.

FANCY DRESS FOR JUVENILES AND ADULTS

Suggestions which Improve Attractive Costumes

In this Encyclopedia related information will be found under the headings Children's Party; Dance; Dancing. See also Making-up; Amateur Theatricals.

A costume which is out of the common, that does not cost too much, and is comfortable to dance in is what most people desire in the way of a fancy dress. English or French costumes of the powder periods are always dignified and becoming, and though they can hardly be said to be uncommon are required for a 'Powder Ball,' and are often favoured by men and older women who do not care for the exaggerated type of costume seen at any fancy dress dance. Adapted by modern designers, dresses that are suitable for wear with powder and patches may be quite original.

Whatever the style, if a white wig is to be worn, care should be taken not to hire one with a woolly, wispy appearance. It ought to be well dressed, with that crisp formality in each curl which marks the finest designs, and is better, especially if it is to be worn with a strictly period 'square cut' 18th century costume such as is shown in Fig. 1, when it is not made of pure white hair, but with a slight mixture of grey. Patches placed on the cheek and chin should not be forgotten. These cost 1s. 3d. for a box of assorted sizes. Women require a dainty pink and white make-up with accentuated eyebrows and lashes for wear with a powdered or white wig.



Fancy Dress. 1. Powdered wig and period costume. (Claude Harris)

Shepherd and shepher-dess or other rustic china figures furnish models, copies of which can be carried out by the clever amateur dressmaker. Such picturesque ideas are more charming for children than grown-up persons, and can be carried out inex-pensively in printed and plain sateens. Success lies in matching the delicate colouring and approx-imating the various patterns of the painted materials; also in copying the details of the oblong birdcage with stuffed bird emerging, the oval basket of mixed flowers, the straw hat full of pink roses, or the ribboned lamb, one of which typical objects should be carried, except when dancing.



2. Christmas Tree fairy.(Bassano)

Very small girls look attractive as Christmas-tree fairies. A pretty design is shown in Fig. 2. Small boys may favour a pierrot or harlequin costume (Fig. 3), unless they set their hearts on a wooden soldier, pirate or Red Indian design. Patterns for many good fancy dresses are obtainable from the best pattern services.



3. Harlequin pierrot. (Bassano)

The topical costume often finds favour with men; a clever idea from a newspaper cartoon or caricature, a popular play or book title travestied. These are necessarily whims of the moment, and their value lies in being apt and well done. Other inspirations may come from studying the posters on the hoardings, either of plays or advertised goods. Characters out of fiction and drama of present and bygone times always make their appearance, more or less effectively, at fancy dress dances, and this class opens up a wide field. Sometimes a dance is arranged when all the dresses have to be of a period or out of a book —as, for instance, a Victorian, or an Arabian Nights' ball. The Victorian jockey (Fig. 4) is a suggestion for a man's costume for the former.

National dresses offer a variety of distinctive designs, of which many beautiful examples are illustrated in such a work as "Peoples of All Nations." Such costumes look well in pairs, and attract the eye to both partners.



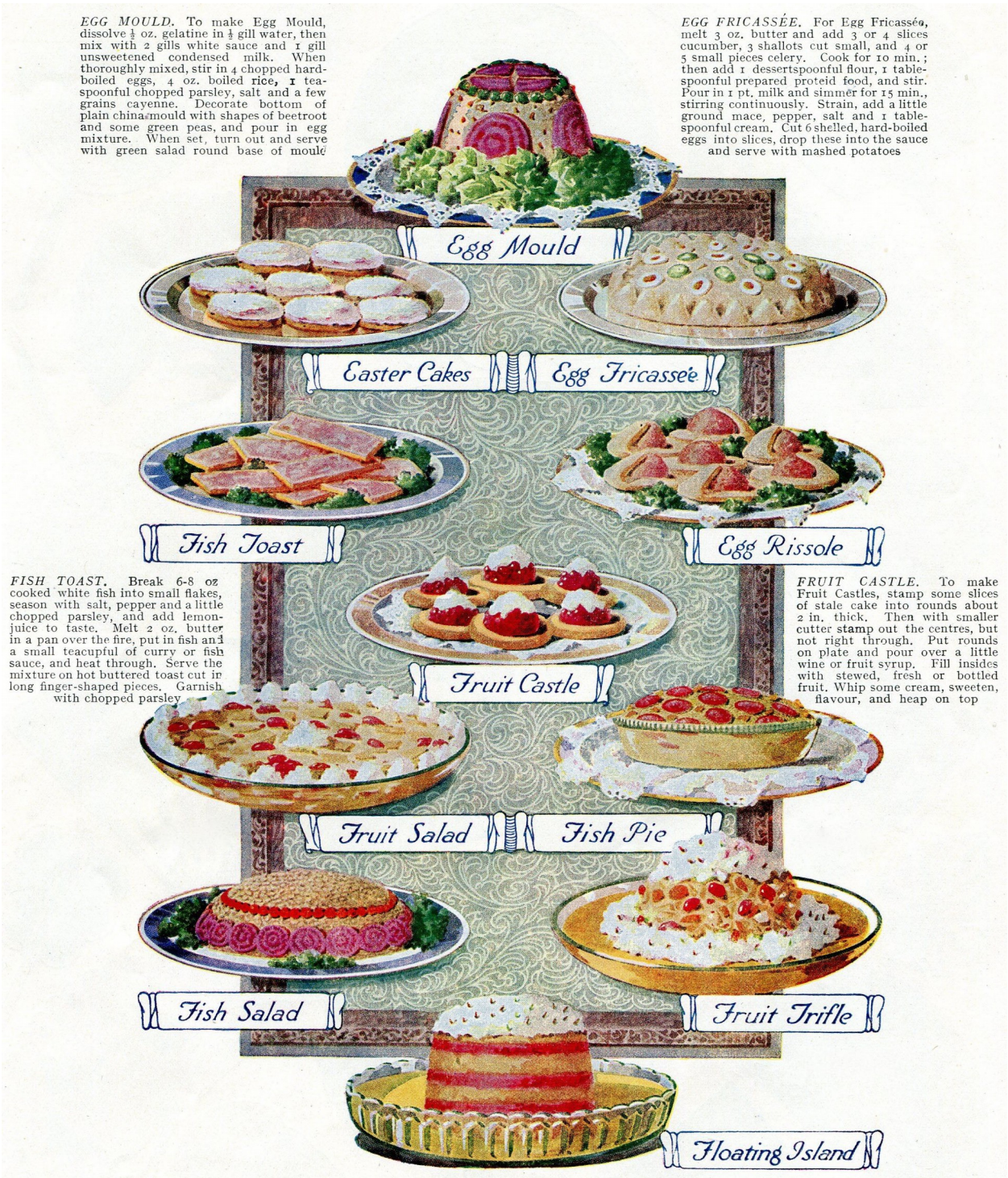
4. Victorian jockey, for a "character" dance.

Oriental Make-up. Oriental costumes open up a wide field of choice and can be dignified, beautiful, piquant, mysterious or comic according to design and suitability. A beautiful Chinese princess dress is shown in Fig. 5. Such costumes need a special make-up for the skin and eyes to render them effectively in keeping with the character represented. This is not a difficult task according to the following directions.



5. Chinese princess design suitable for an oriental ball; it is carried out in Chinese embroidery.

Having cleansed the face thoroughly with cold cream and wiped it with an absorbent tissue or soft towel, apply grease paints Nos. 5½ and 6 for a dark



'E' AND 'F' RECIPES: A SELECTION SHOWN IN ACTUAL COLOUR

Easter Cakes. Beat 5 oz. butter to a cream, mixing in same quantity of sugar, beaten yolks of 3 eggs and a little brandy. Stir in 1 lb. flour, moistening mixture with a little milk if too dry, and add 3 oz. currants. Leave paste in cool place for an hour, roll out thinly, and cut into rounds. Bake in warm oven. A few minutes before ready, brush over with beaten white of egg and sprinkle with castor sugar. Floating Island. Cut a round sponge cake into slices, spread these with apricot jam and soak in a little liqueur. Put them together again in a large glass dish, cover with whipped cream, sweetened and flavoured. Decorate with chopped almonds and pistachio nuts and pour custard round base of cake. Sherry may be used if preferred to liqueur.

foundation, blending the colours evenly over the face; a few strokes from each stick of paint will suffice, then working them in with the finger-tips. If the effect is too dark a little No. 2 grease paint well worked in will remedy this. Having thoroughly smoothed the foundation tint apply a grease rouge (or a little grease paint No. 9) and smooth carefully. Now soften a piece of white soap and place it over the eyebrows. When this is dry, smooth the grease paint very gently up to it and the hairs will be invisible. Apply an eyebrow pencil, drawing the ends of the eyebrows in an upward slanting curve, slightly or exaggeratedly according to the requirements and character of the costume.

To give the oriental effect to the eyes a line is drawn from the outer corners upwards, about half an inch long, with a black lining pencil, and after powdering the face with a dark shade of powder, a woman should make up her lashes heavily with black mascara, and a man lightly, just sufficiently in his case to remove any powder from them. To give a dark-eyed effect the upper eyelids should be shaded with a deep blue lining pencil. A brilliant but rather dark red shade of lipstick should add the finishing touch for a woman.

Some Quaint Costumes. Many variations of black and white fancy costumes are seen at a big dance. A chimney sweep design, with a stove-pipe hat made of cardboard and covered with black paper, the bodice of white sateen with bricks marked on it in black stencil paint, trousers of black velveteen fringed in long strips below the knees, black gloves and a sweep's brush in place of a fan, supplies an idea for a quickly made costume. A chessboard design is also striking for either a man or a girl. The long trousers are made in black and white check sateen with braces to match over a white silk shirt. The headdress or cap is ornamented with chessmen in black and white.

Polka dots of black on white sateen make up into an attractive pierrot costume with ruffles half-black and half-white. A silk wig can be worn with such a costume, which is made of black silk knitting yarn on one side of the parting and of white silk yarn on the other. Another beautiful black and white dress is shown in Fig. 6. The body part of this butterfly and the skull cap can be made of black velveteen, while the wings can be of white silk with a batik dyed design which is outlined with silver sequins.



6. Butterfly, a beautiful design for a black and white costume.

Mascot dresses are easy to make at home. They may be in pierrot style for a boy or a white sleeveless blouse and a short striped skirt may be worn as the foundation for a girl. The object is to adorn them with as many charms and symbols of luck as possible; some of these may be embroidered on the material, others applied with buttonhole stitching, hung on a chain round the neck, worn as a headdress or attached to a waistbelt in the manner best suited to the style of the costume. Sometimes dresses are based on deco- rative things. Fig. 7, "Feathers," embodies such an idea.



7. Feathers, consisting of a softly draped silver gauze bodice with skirt of white feathers and georgette. (Henri Manuel)

Strange wigs may form an important part in quaint designs. They are best and coolest made on a foundation of embroidery canvas shaped to the head. Wigs are effective in wool or knitting silk left in loops or the loops cut and frayed to form a fringe; another way is to make them of tiny blossoms and leaves. Small roses, jessamine, violets, and lilies of the valley are suitable with leaves skilfully introduced to soften the face line, and each dress carrying out the colour and petal shapes of the flower chosen. Other wigs are made completely of coloured feathers.

In wool and silk these wigs give a touch of originality to the many variations of the pierrot and pierrette, and all the harlequinade characters. Such costumes and many flower costumes can be effectively made up in crêpe paper for children's fancy dress dances, when the object is to have bright and original designs with a small outlay.

FANLIGHT. Originally this term meant a glazed sash filling the arched head of a door or window opening, and was so called from the fact of its having bars radiating upward like a fan. Nowadays it denotes any sort of small window at the top of a door or larger window.

Most fanlights are bottom hung, on stout butt hinges, the casement opening inwards from the top. A simple quadrant of iron, with double cords, pulleys and a cleat, is cheap to buy and easy to install.

FARAD. An electro-magnetic unit of capacity. It is the capacity of an electrical condenser charged to a potential of one volt by one coulomb of electricity. A microfarad (μF) is one millionth of a fared.

The application of electricity produced by an induction coil is known as faradism or faradization. It is more stimulating than the constant current, and may be applied to the whole body or to any part. *See* Capacity; Electricity.

Farcy. *See* Glanders.

FARINACEOUS FOOD. Farinaceous foods consist very largely of starch: bread, 50 per cent.; oatmeal, 63 per cent.; maize, 64 per cent.; macaroni, 77 per cent.; and rice, 84 per cent.; and in the last-named the amount of proteid is small. Wholemeal and standard bread contain the fat soluble vitamin A, and are richer in organic phosphorus compounds than white bread, and possess obvious advantages for children unless white bread is supplemented by milk, butter or animal or fish fats. Margarine of the vegetable variety does nothing to improve the food value of white bread in respect of vitamin, though it supplies fat. Wholemeal bread is less easily digested than white bread, however, and may give rise to symptoms of indigestion. Maize in the form of cakes or porridge is a good food, but the flavour is too coarse to make it a food of choice. Its derivatives, hominy, oswego and cornflour, have not this disadvantage and are often used in this way.

Farinaceous foods provide the starch which is a necessary constituent of diet, and some provide proteid also, and to a less extent fat; but, to balance all these constituents to our requirements, their use must be supplemented by other things. *See* Diet; Flour; Food; Maize; Oatmeal; Rice, etc.

FARTHINGALE CHAIR. Chairs of this, kind were made for women in the days when farthingales were worn. The specimens in existence date mainly from the 17th century, and are valued by collectors. They are without arms, and are much higher in the seat than ordinary chairs. Most are upholstered, and some have a squat, padded back, with a horizontal top rail. *See* Chair.



Farthingale Chair of 17th century make (Courtesy of Waring & Gillow)

FAST COLOUR. Colours should not be called fast if they are liable to change seriously upon exposure to sunlight, but cloth so dyed or printed that its colour is substantially un-altered after a fortnight's exposure to sun and air can reasonably be so described. Colours are not fast unless they will bear washing, and a test in this respect is to boil a sample for 10 min. in soap and water, with a handful of common washing soda to the pint.

The crucial test of fastness is the readiness of the seller to give the money back should the colour fade, and certain cloths can be guaranteed in this way Lacking definite guarantees, the assumption must be that fast colour does not mean unalterable fastness under all conditions of wear and laundering. The matter is really important, for in some circumstances the garment is useless when the colour has gone. Articles made in mixed colours cannot invariably be redyed, and as a general rule re-dyeing, whether done at home or at the dyers' and cleaners' works, is less fast in colour than a good dye applied while the cloth is being made. *See* Colour; Dyeing; Laundry.

FASTING. Properly speaking, fasting means complete abstention from nutritious food for a shorter or longer time. It is sometimes a useful remedy when carried out under the supervision of a doctor, but for the great majority of people a prolonged fast is exceedingly risky and nearly always injurious. The temporary deprivation of food will frequently lower the resistance to infection by the germs of disease. After a long fast the digestive organs are in a debilitated state, so food should at first be liquid, and taken in very small quantities.

In cases of acute gastritis fasting for at least 24 hours is required to give the stomach a rest; and a short fast will also be useful when, from over-indulgence in rich food, the liver is overloaded and biliousness has been induced. Abstinence from certain kinds of food, or a large reduction in the quantity taken, is beneficial in many conditions. Thus, in diabetes and in obesity, starchy and sugary foods are much curtailed, and in certain forms of rheumatism and in other diseases marked benefit may accrue by omitting butcher meat from the diet. *See* Diet: Obesity, etc.

FAT: Its Food Value. Fat is found in the body in adipose tissue, bone marrow, and elsewhere. Adipose tissue is widely distributed amongst the tissues and, with the exception of a few situations, e.g. the eyelids, exists as a layer of varying thickness beneath the skin. The stored-up fat forms an important fuel reserve for the use of the body.

Fat is made up of carbon, oxygen and hydrogen. No nitrogen being present, it cannot take part in the building-up of the muscles or organs, but it supplies heat and energy to the body, an ounce of fat giving more than twice as much as an ounce of starchy food.

Fat alone cannot support life, but it is a necessary ingredient of any diet. Fats that are derived from vegetable substances and sold as margarine do not provide a suitable source of fat for growing children, on account of their not containing fat soluble vitamin. This is present in mother's milk and is derived from the cow's milk and animal fat included in the mother's food. Fish oils also contain it. Infants require a larger proportion of fat than adults. When a child is fed on cow's milk, the whole of the natural fat should be present. On skimmed condensed milk a child will starve.

The standard proportion of fat in the diet of an adult is as follows:

Fat	5
Protein	12
Carbohydrate	50

While proteins and carbohydrates (sugar and starch) are digested by the juices of the stomach and pancreas and absorbed into the blood vessels, fat is emulsified

FARINACEOUS FOOD. Farinaceous foods consist very largely of starch: bread, 50 per cent.; oatmeal, 63 per cent.; maize, 64 per cent.; macaroni, 77 per cent.; and rice, 84 per cent.; and in the last-named the amount of proteid is small. Wholemeal and standard bread contain the fat soluble vitamin A, and are richer in organic phosphorus compounds than white bread, and possess obvious advantages for children unless white bread is supplemented by milk, butter or animal or fish fats. Margarine of the vegetable variety does nothing to improve the food value of white bread in respect of vitamin, though it supplies fat. Wholemeal bread is less easily digested than white bread, however, and may give rise to symptoms of indigestion. Maize in the form of cakes or porridge is a good food, but the flavour is too coarse to make it a food of choice. Its derivatives, hominy, oswego and cornflour, have not this disadvantage and are often used in this way.

Farinaceous foods provide the starch which is a necessary constituent of diet, and some provide proteid also, and to a less extent fat; but, to balance all these constituents to our requirements, their use must be supplemented by other things. *See* Diet; Flour; Food; Maize; Oatmeal; Rice, etc.

FARTHINGALE CHAIR. Chairs of this, kind were made for women in the days when farthingales were worn. The specimens in existence date mainly from the 17th century, and are valued by collectors. They are without arms, and are much higher in the seat than ordinary chairs. Most are upholstered, and some have a squat, padded back, with a horizontal top rail. *See* Chair.



Farthingale Chair of 17th century make (Courtesy of Waring & Gillow)

FAST COLOUR. Colours should not be called fast if they are liable to change seriously upon exposure to sunlight, but cloth so dyed or printed that its colour is substantially un-altered after a fortnight's exposure to sun and air can reasonably be so described. Colours are not fast unless they will bear washing, and a test in this respect is to boil a sample for 10 min. in soap and water, with a handful of common washing soda to the pint.

The crucial test of fastness is the readiness of the seller to give the money back should the colour fade, and certain cloths can be guaranteed in this way Lacking definite guarantees, the assumption must be that fast colour does not mean unalterable fastness under all conditions of wear and laundering. The matter is really important, for in some circumstances the garment is useless when the colour has gone. Articles made in mixed colours cannot invariably be redyed, and as a general rule re-dyeing, whether done at home or at the dyers' and cleaners' works, is less fast in colour than a good dye applied while the cloth is being made. *See* Colour; Dyeing; Laundry.

FASTING. Properly speaking, fasting means complete abstention from nutritious food for a shorter or longer time. It is sometimes a useful remedy when carried out under the supervision of a doctor, but for the great majority of people a prolonged fast is exceedingly risky and nearly always injurious. The temporary deprivation of food will frequently lower the resistance to infection by the germs of disease. After a long fast the digestive organs are in a debilitated state, so food should at first be liquid, and taken in very small quantities.

In cases of acute gastritis fasting for at least 24 hours is required to give the stomach a rest; and a short fast will also be useful when, from over-indulgence in rich food, the liver is overloaded and biliousness has been induced. Abstinence from certain kinds of food, or a large reduction in the quantity taken, is beneficial in many conditions. Thus, in diabetes and in obesity, starchy and sugary foods are much curtailed, and in certain forms of rheumatism and in other diseases marked benefit may accrue by omitting butcher meat from the diet. *See* Diet: Obesity, etc.

FAT: Its Food Value. Fat is found in the body in adipose tissue, bone marrow, and elsewhere. Adipose tissue is widely distributed amongst the tissues and, with the exception of a few situations, e.g. the eyelids, exists as a layer of varying thickness beneath the skin. The stored-up fat forms an important fuel reserve for the use of the body.

Fat is made up of carbon, oxygen and hydrogen. No nitrogen being present, it cannot take part in the building-up of the muscles or organs, but it supplies heat and energy to the body, an ounce of fat giving more than twice as much as an ounce of starchy food.

Fat alone cannot support life, but it is a necessary ingredient of any diet. Fats that are derived from vegetable substances and sold as margarine do not provide a suitable source of fat for growing children, on account of their not containing fat soluble vitamin. This is present in mother's milk and is derived from the cow's milk and animal fat included in the mother's food. Fish oils also contain it. Infants require a larger proportion of fat than adults. When a child is fed on cow's milk, the whole of the natural fat should be present. On skimmed condensed milk a child will starve.

The standard proportion of fat in the diet of an adult is as follows:

Fat	5
Protein	12
Carbohydrate	50

While proteins and carbohydrates (sugar and starch) are digested by the juices of the stomach and pancreas and absorbed into the blood vessels, fat is emulsified

into a soapy fluid in the intestine and is absorbed into the lymph vessels.

The following table shows the percentage of fat in various articles of food:

FOOD	PERCENTAGE OF FAT
Rice	0.1
Bread	1½
Milk	3½
Oatmeal	5
Beefsteak	5
Eggs	10
Mutton (medium fat)	20
Cheese (average)	25
Butter	90
Pork (medium fat)	26
Bacon	65

See Diet.

FATHER: His Legal Position. By father, in law, is meant the father of a legitimate child, as the father of an illegitimate child has no rights or duties towards it, save is so far as he may be ordered to contribute by an affiliation order. While father and mother are living together the father is the sole guardian of the children. If they are separated and any question arises, the court will decide.

A father is responsible for supplying his children with food, clothing, lodging and medical attendance up to the age of 16. If a child of any age—even grown-up—becomes chargeable to the Poor Law the father may be compelled to pay. A father is not responsible for the consequences of any wrong done by the child, nor is he liable for its debts unless they were incurred with his authority. In certain cases of offences committed by his child, the father may be ordered to pay the fine. A father has the right to choose in what religion his child shall be brought up. *See* Affiliation; Child; Guardian; Illegitimacy; Mother.

FATIGUE. After a hard day's work, mental or physical, the vigour of the whole body is lowered. Waste matters have accumulated in the system, and until they are carried off by the circulating blood a greater or less sense of fatigue remains.

It is a mistake, when in this state, to eat a full meal, even if food has not been taken for some hours. A tired person should lie down for half an hour, or longer, before taking a meal. Recovery will be all the quicker if one neither talks nor reads. Massage, when obtainable, is the best of all restoratives when one's muscles are tired and clogged with waste matter. Alcohol only disguises fatigue, in no way removing it. *See* Brain Fag.

FATSIA. This is an excellent room plant with large, handsome, indented evergreen leaves. In warm showery weather the plant may be placed out of doors.

Tall growth may be remedied by the process known as stem-rooting, by which the top of the plant is converted into a dwarf. Repotting, when necessary, is done in March, using a compost made of two parts loam, one part leaf-mould, and one of silver sand. This plant is hardy in the southern and other mild counties.

FAUCET. This is a term usually applied to the socket of a cast-iron pipe. It is also used to describe a spout with a plug or spigot used for drawing liquor from a cask. The name is also, in some districts, used as a description for any kind of tap from which water can be drawn, for a hot or a cold water system. *See* Stop-cock; Tap. Pron. Faw-set.

FAVUS. In human beings favus or honeycomb ringworm is a contagious disease which may appear anywhere on the skin, but oftenest on the scalp. Its chief characteristic is the formation of bright sulphur-yellow, irregular, cup-shaped crusts, pierced on the scalp by the hairs. They are easily broken off, and when removed a reddish surface is seen, which leaves a scar on healing. The cause of the disease is a vegetable parasite or fungus.

In treatment, the hairs piercing the crusts must be pulled out, and the rest of the hair should be cut close. The crusts are softened by applying lint wet with olive oil, and covered with gutta-percha tissue, and removed by washing with soap and water. A germicidal application should be applied morning and evening, composed of precipitated sulphur, 4 drams, and purified lard, 2 oz. Treatment must be continued for many months where the scalp is attacked. X-ray treatment sometimes gives excellent results. *See* Ringworm.

In Poultry. The disease favus or white comb in poultry is due to a parasitic fungus, Lophophyton gallinoe, which is distinct from that causing favus in mammals. This fungus attacks the comb and wattles of birds, and spreads from the naked parts of the head to parts covered by feathers. The breast and more often the rump may be attacked. One side only of the neck may be quite denuded of feathers, whilst the other shows no signs of the disease. As a rule, however, it is the comb that suffers first and most from the attack.

The first signs of an attack are small, pale, irregular, cup-like spots on the comb or wattles, generally appearing on the comb first. These spots grow together, and sooner or later form a crust of a dirty yellowish-grey substance, which is often arranged in concentric layers. When the feathered areas become invaded the disease is more persistent and may end fatally. The feathers may become erect, dry, and somewhat brittle, and fall off, the naked skin being covered with crusts. The affected birds exhale a mouldy odour.

The treatment consists in bathing the infected parts with warm water and soft soap, and then applying some ointment to destroy the parasite. An ointment made of sulphur and lard, mixed in equal proportions, is a simple remedy. Another more effective but more expensive remedy is nitrate of silver, which, when

rubbed into the comb and wattles, has been found of great benefit. An ointment of 5 p.c. of nitrate of silver in soft paraffin (vaseline) is recommended for the purpose in Bulletin No. 8 issued by the Ministry of Agriculture —from which these particulars of the disease and its treatment are taken. Red oxide of mercury 1 part, to lard 8 parts, is an excellent remedy if persistently used for several days. Before applying the ointment the diseased parts should be carefully fomented, and all the crusts removed as far as possible with a blunt knife.

FEATHER BED. When feather beds are made, care should be taken to see that the feathers are thoroughly stoved and sterilized in the first instance; they may then be enclosed in a case of ticking, the inside of which is rubbed with beeswax to prevent feathers from pushing through.

The dressing may be done at home or by the firm responsible for the manufacture of the bed. The process consists of separating the light feathers from the quills, and returning the cleared or loosened bulk to the case. *See* Bedding; Bedstead; Mattress.

FEATHER EDGING. In furniture this is a method of using marquetry so as to give a frame of special character round a central panel. It is found especially on walnut pieces of the reign of Queen Anne. It is made by cutting two thick strips of wood so that, when they are placed side by side and glued down, the grain of each piece meets in a feather-like formation. It is also known as herringbone. *See* Marquetry; Queen Anne Style.

FEATHERED JOINT. A feathered joint is one in which the joint between two pieces of wood is secured by means of a narrow strip of relatively thin wood known as a feather. To a large extent it is similar to the groove and tongue joint, except that the latter is formed from the solid.

Featheredge boards, such as weather-boarding, where one edge is thinner than the other, are laid overlapping, and the joint is sometimes known as a feathered joint. *See* Joint.

FEATHER GRASS. This is the English name of Stipa pennata, an ornamental hardy perennial grass worth growing in a border for the sake of its graceful, nodding plumes. Propagation is by seed, sown in a frame in spring or by division in autumn. Stipa gigantea, the giant feather grass, grows 3 feet high.

FEATHERS: Their Care and Cleansing.

The feathers of poultry, when, they have been properly cleansed and preserved, provide the household with material for stuffing cushions, beds, bolsters, and pillows. They are also useful to make good deficiencies when remaking such articles.

To achieve the best results, care in plucking the birds is essential. There must be no skin or flesh adhering to the feathers, and in the case of geese the coarse feathers should be removed first, so that the fine inner down may be kept separate. This down forms the most valuable kind of feather. Chickens are sometimes plucked too young for their feathers to be of any value, and only those of mature fowls should be used. The same applies to pigeons. Game feathers, too, are seldom worth preserving, as they are apt to be tainted, and likely to remain so indefinitely.

There are two methods of preserving feathers, viz., wet and dry, the former being adapted to small feathers and quills, and the latter to small feathers only. To prepare by the wet process, place the feathers in water heated to a temperature of 100° F. into which sufficient white curd soap has been dissolved to form a milk-like emulsion. Then stir and let soak for an hour, after which stir again, and then collect on a sieve to drain off. After similar treatment in a second warm bath, using Castile soap instead of white curd soap, rinse the feathers in two baths of tepid water, made slightly alkaline with a little ammonia, and finally in a bath of clear cold water. The feathers should then be placed in paper bags and dried in a mildly heated oven.

Preserving by the dry process is effected by sprinkling the feathers slightly with a dilute non-corrosive disinfectant, and packing them loosely in paper bags. The bags should then he placed in an oven sufficiently hot to scorch paper in 5 or 6 min., and left there until the bags begin to brown. In both processes the feathers must be subsequently beaten lightly to get rid of dust, after which they may be stored in waxed paper bags until ready for use. After five years the feathers usually require re-dressing.

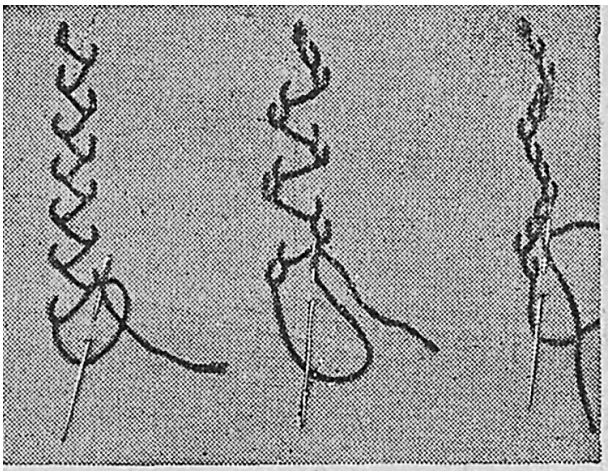
Ornamental Feathers. Ostrich feathers that are dirty and straight can be washed and recurled. The feathers are dipped in and out of a warm lather of soapy water. They are then well rinsed, shaken out, and dried in front of the fire. They burn very easily, so, although heat is essential, it must not be too great. The feathers should be shaken constantly and when dry recurled by drawing a blunt penknife or ivory paper knife along each strand. Great care must be taken not to cut the feather; the point of the knife can be used if blunt, otherwise it is better to use the back of the blade. This is held obliquely, and drawn across the strand until it curls.

Feathers that may have got damp and straight through exposure to rain can be curled in the same way. In the case of a feather ruching, it is enough to shake the trimming before the fire immediately after exposure to damp. The feathers must not be allowed to dry straight. If they do, the process of recurling becomes much more difficult.

Feathers are bleached by washing them in warm soapy water, and then exposing them to fumes of sulphur. To dye feathers, first put them into hot water, and allow them to drain. When they are lifted out of the dye, they should be rinsed at least twice in clean, cold water, and then dried before the fire. If red, however, one rinsing will be sufficient.

Marabout trimmings are washable in warm soapy water, and resume their soft, fluffy appearance if constantly shaken during the drying process. Swansdown trimming can be washed in the same way, and dried before a fire, with constant shaking. When not in actual use, valuable feathers should be wrapped in tissue paper and stored in boxes with either camphor or naphthaline balls as a protection against moth.

FEATHER STITCH. This is a useful trimming, as it can be executed with coarse cotton, fine silk, or any other medium in order to suit the foundation. There are three forms of feather stitch, single, double, and treble, formed with one, two, and three stitches in succession to the left, and the same order to the right, of a centre line.



Feather Stitch. Left to right: single, double and treble forms of this decoration.

The beauty of this work depends on its regularity, and this can be ensured by dots or by running a centre line. For ordinary purposes the stitches should be about ⅛ in. apart and about the same depth.

FEBRIFUGE. A febrifuge is a remedy used to bring down the temperature in fever. A cold bath in typhoid acts as a febrifuge. Drugs like sweet spirits of nitre and mindererus solution, and the free use of liquids, by encouraging perspiration help to reduce temperature.

FEE: Of Professional Men. This word is chiefly used for payments made for services rendered by professional men, e.g. doctors, solicitors and architects.

Fees of Doctors. Doctors usually charge a certain amount per visit, which sometimes includes medicine, but sometimes does not. It varies with the size of the house visited and the standing of the patient. An ordinary middle-class family will be charged anything from 5s. to 10s. 6d. per visit. Double fees are charged for night visits, but much less when the patient visits the doctor. The class of patient accustomed to do this is, however, dealt with under the National Health Insurance scheme.

There are various special fees. For instance, in cases of childbirth it is usual to charge an inclusive fee of perhaps £5 5s., which includes attendance at the time of delivery and until the patient is well again, unless unexpected developments occur. The fees of specialists, both for consultation and for operations, depend almost entirely on the standing of the man employed. In the ordinary way a first visit to a London specialist will cost £3 3s., and subsequent visits one or two guineas each. Larger fees are charged if the patient is visited, and still larger if an operation is performed.

Doctors do not usually, give any details of their visits when they render their accounts, usually half-yearly, so in most cases the householder can only surmise whether or not the total is approximate, in his opinion, to the services rendered. Nursing and maternity homes charge fees, but these vary very much indeed.

Solicitors' Charges. The fees charged by solicitors are laid down in a scale which was drawn up under an Act of Parliament. This scale chiefly relates to sales, purchases and mortgages, and is based upon the value of the property or the amount of money involved. The fees charged are intended to cover the services of the solicitor and his clerks, but not any outlay for stamps, duties, etc. Very few solicitors charge on the full scale, but on the other hand it is almost impossible for a layman to check his solicitor's bill. He can, however, make a bargain for a fixed sum when he commissions the work, or if dissatisfied he can have the bill of costs taxed. This, however, may involve him in considerable expense.

Fees of Architects. Architects charge usually on the amount of the contract. A charge of 10 p.c. on the cost of a house of moderate size is generally regarded as reasonable. Fees or commissions are also charged by house agents and auctioneers. For selling furniture by auction a usual charge is 5 p.c. on the amount realised. For selling property a smaller percentage is usually charged, especially if the amount involved is considerable. A charge of 5 p.c. is also made for letting houses and furnished flats, the amount being paid on the first year's rental. These fees are paid by the seller or owner, the buyer or tenant usually paying nothing. Valuations of furniture, etc., are also charged on a percentage basis, which varies from 2½ to 5. There is usually a minimum fee of five guineas.

FEEBLE-MINDED: Care of Children who are mentally weak may be greatly improved as a rule by intelligent careful training and attention to their health. On the other hand, if neglected or otherwise improperly treated, they may remain permanently backward, and find it very hard to earn a living or go through life with ordinary success. There are innumerable grades of mental weakness.

From the earliest age the mother must try to arouse the child's interest in his surroundings. Little things that healthy children notice and learn about for

(Continued in page 812)

FEBRUARY

What to do in the Garden

Flowers

Syringe azaleas, heaths, and other hard-wooded plants

Keep calceolarias, fuchsias, and other summer bedding plants at a temperature of about 50° F.

Take off tops of fuchsias and start them in gentle heat to increase supplies

Pot up another lot of lilies

Sow half-hardy annuals in boxes

Plant the herbaceous border with hardy perennial plants. Plant leaf-losing trees and shrubs. Prune winter jasmine Transplant autumn-sown annuals

Give gravel paths a first and strong dose of weed-killer

Finish planting hardy roses

Patch and edge turf on playing lawns

Plant hedges of leaf-losing shrubs

Knock off snow, if any, from branches of evergreens with a broom or rake

Towards end of month, lower slightly the temperature in which summer bedding stuff is growing

Sow annuals in boxes for transplanting later

Fruit

Finish pruning fruit trees of every description

Give top dressing of farmyard manure, where available, to hardy fruit borders

Cut back stocks for grafting

Use the knife only lightly upon black currant bushes

Wash indoor vines, and paint them with a mixture of sulphur, soot, lime, and soap-suds

Plant a new strawberry bed

Spray fruit trees with lime sulphur

Vegetables

Sow early peas on a warm border

Sow any kinds of early salad crops in frames that can be spared

Look over stored vegetables, and take out any that show signs of decay

Set seed potatoes in a light, frost-proof place

Plant Jerusalem artichokes in an unwanted corner

Sow broad beans for early crop

Bend the leaves of flowering broccoli inwards, to protect them from frost

Give the cabbage patch a dressing of lime

Sow short horn carrots for an early crop on a warm border

Sow onions for spring thinnings

Plant seakale and rhubarb; also shallots and onion sets

Food in Season

Fish

Barbel; bream; brill; carp; cod; dory; eels; flounders; gurnet; haddock; hake; halibut; herring; ling; mackerel; mullet (red); perch; pike; plaice; salmon; skate; smelts; soles; sprats; tench; turbot; whitebait; whiting

Shellfish

Crab; crayfish; lobster; mussels; oysters; prawns; scallops; shrimps

Meat

Beef; house lamb; mutton; pork; veal; venison

Poultry and Game

Capons; capercailzie; chicken; duck; fowl; geese; hares; larks; landrails; partridges; pheasants; pigeons; pintail; plover; ptarmigan; pullets; prairie-hen; quails; rabbit; snipe; teal; turkey; wild fowl; widgeon; woodcock

Vegetables

Artichoke; beetroot; broccoli; Brussels sprouts; cabbage; cardoons; carrots; celeriac; celery; chervil; chicory; cress; cucumber; endive; horse-radish; leeks; lettuce; mushrooms; onions; parsnips; potatoes; radishes; salsify; savoys; Scotch kale; seakale; spinach; tomatoes; turnips; turnip tops

Fruit

Almonds; apples; bananas; Brazil nuts; chestnuts; cob nuts; cranberries; grapes; lemons; limes; medlars; oranges; foreign peaches; pears; pine-apple; rhubarb; walnuts

Notes for the Month

FEBRUARY 8 .. Half-quarter Day
FEBRUARY 14 .. S. Valentine's Day

themselves the feeble-minded child must be taught. As he becomes old enough to understand, habits of cleanliness and self-control must be impressed upon him. Threats and scolding and punishment are worse than useless. The child must not be ridiculed or cowed, but encouraged. Bad habits must be corrected. In this matter it is necessary to explain why certain practices are objectionable. If he steals, explain that he will not be trusted, and that things will be locked up; if he is untruthful, tell him that no one will believe what he says in future, and that people will dislike him. This is better than punishing or threatening or scolding.

The weak-minded child must be taught regular habits. He should go to bed and get up much about the same time every day, and have meals at fixed hours. He should be taught to make full use of all his senses—sight, hearing, touch, smell, and taste. Physical exercises, when supervised, and massage, will help in developing and training in the proper use of the muscles.

In many cases it is better not to send the feeble-minded child to school until he is at least six years old. If a special school or institution for children of feeble mind is available, he will be much better there than at an ordinary school. Much has been done by legislation to safeguard the interests of the mentally deficient.

FEEDER: For the Baby. This serves the same purpose as a bib, but is larger. It usually takes the form of a square or oblong piece of material, from one side of which a semicircular piece is cut out for the neck, tapes being secured to the shoulders to fasten it round the back of the neck, while often tapes are sewn to the base of the sides, to pass round the waist and tie at back, so that the feeder does not move out of position. Sometimes, however, the back is made exactly like the front, so that the feeder can be reversed as needed.

Feeders are made of good white washable materials, and the favourite trimming consists of animals, such as bunnies or chicks, done in appliqué work. Feeders are generally made of single material, hemmed at the edges, or buttonholed. Pretty designs can be worked in cross-stitch, the feeder bound with a contrasting colour, which matches the embroidery.

Making a Pattern. A pattern for a feeder may be drafted thus: Cut a piece of paper to measure 13 in. long and 5 in. wide. Mark one of the shorter edges with the word top. Measure from this top edge down one of the longer edges some 2 in., and make a mark there; then measure from the first point across the top edge some 2 in., and make another mark. From the mark in the longer edge now cut through in a nicely curved line to the mark in the top edge, and so hollow out the neck part. The pattern, when drafted, consists of half the feeder, and the shorter of the two long edges is the centre front. When cutting it in material, this front edge should be put to a fold in a piece of doubled fabric, so that a whole feeder can be cut out. The neck should be faced in with a strip of material. *See* Embroidery.

FEEDING BOTTLE. The best type of feeding bottle is the upright type without a valve, as it is easy to clean and the mixture can be poured directly into it when prepared once in the 24 hours. The teat should have a bulb at the end and be of good quality rubber. The hole in the teat should be large enough to allow the infant to draw out the milk without too much difficulty, but not large, or the milk will be bolted with subsequent indigestion and sickness. For this reason it is useful to have two teats, one with a small hole to use at the beginning of the feed when baby is hungry and sucking vigorously; and one with a slightly larger hole to use towards the end of the feed if baby becomes tired and feeds too slowly.

It is best to have five bottles, one for each feed; in this way the mixture can be prepared once in the 24 hours and poured into all bottles at the same time. Stand bottles in a cool place covered with muslin.

Before giving to the baby, stand the bottle containing milk in hot water to warm it. Heat to 100° Fahrenheit and cover with a flannel bag to maintain the temperature during the feed. When the feed is over any milk left in the bottle should be thrown away and the bottle rinsed with cold soda water, shaken well and rinsed. The teats should be turned inside out, rubbed with dry salt inside and out, then rinsed in cold boiled water, drained, and kept dry standing on a saucer under a cup or mug. Before using again the bottles should be boiled. The teats should be scalded once a day—never boiled. Old-fashioned bottles and feeding methods should be carefully avoided. The above suggestions are approved by the Truby King school of thought. *See* Baby.

Feet. *See* Foot.

FELLOE. A felloe, or felly, is the outer rim of a wooden wheel, or the curved pieces of which it is composed. A simple example is the wooden wheel of a garden wheelbarrow, which generally has four separate pieces or fellies forming the rim. These pieces are separately sawn from suitable timber, and when made up in this way the grain of the wood is more nearly concentric with the wheel, which is much stronger than if the rim was sawn from a solid piece of board.

Should a small wheel be broken at the felly, the damaged part may be sawn out, the joint faces of the remaining parts cleaned up true, and a new felly cut to shape from timber of a corresponding thickness, the joint faces being carefully fitted to the old work and secured with short dowels rounded at the end. The steel rim will have to be removed and replaced in the usual way.

FELT: Varieties and Uses. There are many uses for the various kinds of felt in house furnishings and in the manufacture of hats. In the latter the two chief kinds of felt are fur and wool, the former being, the more expensive. Rabbit hair obtained by paring away the skin from the fur is the chief material used in

making fur felts, and hare fur is employed for velours felt. Specially fine surfaces are put upon hat felts by using a little of such fine hair as nutria.

Felts proper have no thread structure, but are made by matting together fibres which exhibit peculiar powers of cohesion. Goods, however, are sold as felts, notably for carpet or mattress underlays, in which there is an upper and a lower surface of hairy felt and an intermediate woven layer. Felts of this type are practically stretchless and retain their original dimensions, where other kinds may tread out larger, or run up in size. Felt is not designed to take much pulling strain, but if necessary to stretch it tight the pull should be in the direction of the length rather than the width. Fine felts closely compacted from soft wool are made into bedroom slippers with a thicker, coarser felt for the soles.

Roofing felt, which is the coarsest kind, is composed of hair, wool, jute waste, and other rough fibre. Used under corrugated iron roofing it tends towards coolness in summer and warmth in winter. Nailed upon wood and treated with tar and shingle, it makes an inexpensive non-conducting weatherproof roof. Odd lengths make excellent packing material, and strips serve for draught-excluders. Refrigerators can be improvised with felt as a covering. Felt is useful to protect pipes of a house from freezing.

Felt Appliqué. This decoration is effective for floor cushions, work bags, coverlets, nursery cushions and mats. Bundles containing a number of good-sized pieces of different coloured felt are obtainable at handicraft shops, or it may be bought by the yard. As it costs 4/- the yard and ⅛ will cut out quite a number of flowers, animals, etc., it is sometimes better to buy it in this way if several articles are to be made or decorated.

Motifs are cut from the pieces of coloured felt and applied to hessian, cloth, canvas, crash or to a groundwork of the felt itself. Designs and transfers are easily obtainable from a needlework department, or can be originated to form motifs without much difficulty. Wool or matching silk is used to stitch the appliqué . Sometimes flowers are worked in the wools, while leaves and a jar or vase containing the bouquet are cut out in the felt and applied with coarse buttonhole stitch. If a thick wool is used it can be couched on the edge of the felt with small stitches in a matching silk *(see* Laid Work). This method looks particularly well for conventional flower or geometrical designs. Circular holes are usually cut in the centres of flowers and filled in by darning across, using a colour contrast for the horizontal and vertical stitches. *See* Appliqué; Embroidery; Woolwork.

FENBERRY. The name is sometimes given to the cranberry, a hardy evergreen trailing plant bearing deep red globular fruit of sour flavour. It requires an open position on marshy peat, and may be propagated by cuttings, layering, or by division of the plants. *See* Cranberry.

FENCES AND FENCING METHODS

Efficient Varieties and How to Erect Them

This article, which concludes with a section on the law about fencing, is supplemented by other entries on Gate; Post; Wire Netting, etc.

The object of a fence is to define a boundary and to serve as a protection against intruders. It should be strong, efficient, and pleasing in appearance, and can be made ornamental in character. Oak is by far the best wood to use for a fence, not only on account of its long life, but on the score of appearance, and the very small cost of upkeep, an occasional coat of wood preservative being all that is necessary. The construction should be simple, and preferably the posts should stand above the top line of the fence. It is a wise precaution to put such fences together with galvanized iron nails, as an ordinary nail quickly rusts and so will cause unsightly stains.

Oak pales nailed to triangular section cross bars let into strong oak uprights make an effective fencing if the pales are overlapped by a ½ in., 4 pales being usually reckoned to cover 1 ft. of length. Fig. 1 shows an oak pale fence in process of repair, with new gravel boards being fixed.

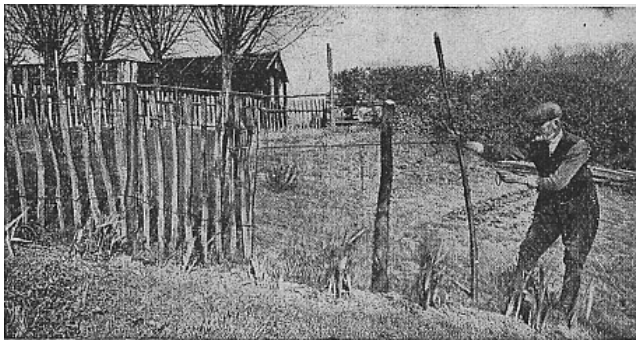


Fence. Fig. 1. Repairing a cleft oak pale fence with new gravel boards.

Chestnut Pale Fence. A cheap and effective type of fence is made of cleft chestnut pales, fastened together by galvanized wire. This fencing, which is supplied in 10 yd. lengths and can be rolled up into a bundle, is excellent for enclosing woodlands and for small gardens. The chestnut fencing is made up in a variety of styles with the pales of uniform height; or, slightly more ornamental in appearance, with adjacent pales of unequal length. Stock heights vary from 2 ft. to 6 ft., with 2 or 3 rows of wire. This fence can be rapidly fixed in any position, even over rough and undulating ground. The straining or end posts should have butt ends and be properly bedded into the ground. Intermediate posts can have pointed ends, and be driven into the ground by means of a wooden beetle or mallet.

Before fixing the fencing the straining post and gate posts should be securely strutted, to prevent them being pulled over. One end of a length of fencing is then fastened to the first post, and the whole piece strained tightly with a simple block and tackle, or with the aid of a 6 ft. pole used as a lever in the manner indicated in Fig. 2. The wires are then secured to the posts with galvanized iron staples, driven in tight.

The assistance of a second person is necessary for this. To join up the lengths, wire them together with the ends of the galvanized wire, which are left protruding. A simple type of fence is made by using prepared timber framed together and completed by nailing slats of wood on to two or more longitudinal rails (Fig. 3).



Fence. Fig. 2. Fence of cleft pales, showing use of lever for straining the wire when securing the fencing to the straining post .

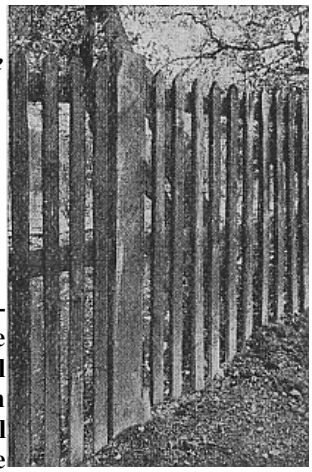
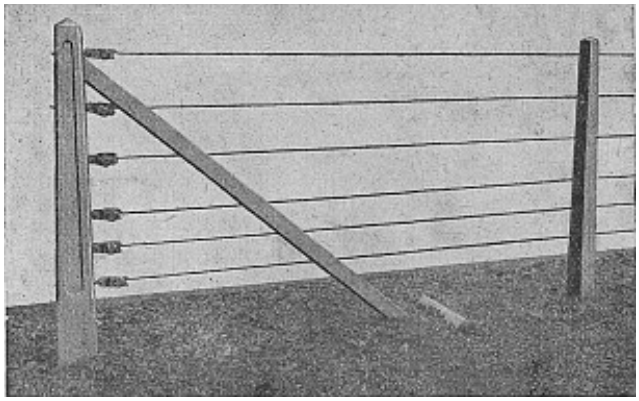


Fig. 3. Simple fence made from prepared timbers.

Wire Fences. An extremely durable fence is made of galvanized hard steel wire woven together to form a network. The horizontal and vertical wires are secured in the process of manufacture by an immovable knot. It is available in rolls of 55, 110, and 220 yd. The horizontal wires are at unequal intervals, varying from 7 to 10 in. at the top to 3 to 6½ in. at the bottom, according to the type of fence and its purpose. The vertical wires are spaced 11 in. to 22 in. apart. The type with smaller mesh makes a strong pig fence. In erecting such a fence it is absolutely necessary that it should be tightly stretched, for which purpose it is desirable to obtain the regulation straining tools supplied by the manufacturers. The posts may be of iron, wood, or reinforced concrete, and all corner, gate, and end posts should be properly strutted.

A similar fence made with horizontal wires only is suitable for cattle, and can be erected without trouble by straining and fixing it to posts by staples. Besides the straining posts and intermediates there are iron spacers ("droppers") which do not enter the ground. The wires are secured to these by a form of iron clip which passes through a hole in the dropper and is closed on to the wire by a special hand tool. This type of fence is especially adapted for undulating ground. Fig. 4 shows a strong fence made of concrete straining posts and standards, to which are attached six horizontal wires. The posts could be cast in a simple mould, the holes for the wires being made at the same time.



Fence. Fig. 4. Example of a concrete post and wire fence, showing the method of bracing the straining post with a strut.

The shape of the posts may vary, but a pattern which tapers on two sides will be found satisfactory, and is more economical in concrete. Immediately before the concrete is placed in the mould the reinforcements should be fixed in place. For ordinary sized posts, steel rod ¼ in. in diameter, placed one at each corner of the post, within about 1 in. of the outer surface, is suitable. The ends may be bent over at right angles, and if bound together in the middle with a piece of stout wire, the reinforcing strength will be greatly increased. The rods should first be wired together in the form required, and the concrete then placed around them in the mould.

After the concrete has been properly cured, which will take a month or so, the fence may be erected in the ordinary way. A post about 7 ft. long should be sunk in the ground to a depth of about 2 ft. 6 in. to 2 ft. 9 in. or so, according to the nature of the soil and the strain to which it is likely to be subjected.

The corner posts will be rendered stronger than the ordinary line posts by making them of larger dimensions, and reinforcing them with larger rods, say, of ⅜ or ½ in. rod, placed on each of the four sides, as well as in the corners. These corner posts should be securely braced up by struts, in order to withstand the constant strain to which they will be subjected by the wire.

Points of Law. Except in certain special circumstances there is no legal obligation on the owner or occupier of land to erect a fence. At the same time everybody is bound to keep his own animals from trespassing on his neighbour's premises, and is liable for the consequences if he does not.

If a fence is put up, there is not any right in anybody to have it kept up, apart from contract. But a contract of tenancy usually implies a legal obligation on the tenant to maintain existing fences. Sometimes a duty is cast on the owner of a fence to maintain it as between himself and his neighbour.

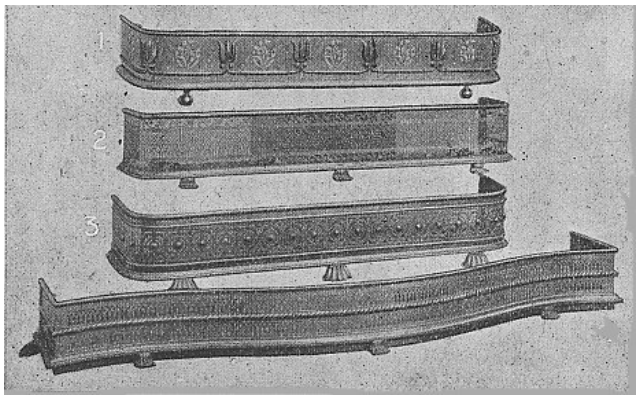
Where land adjoins a highway, if the owner chooses not to fence it, he cannot complain if damage is done

by straying cattle which are being driven along the highway, but if catttle stray about the highway and damage property the owner can claim damages. The owner of land adjoining a highway must fence off anything dangerous and likely to cause damage to travellers. Thus it is negligent to leave unfenced a hole or pit near a dark country road. A wall or fence adjoining the highway is a nuisance if it is in a dangerous condition, and the owner is liable not only to pay damages to anyone who may be injured in consequence of his neglect, but also to be indicted for a public nuisance.

It is dangerous to use barbed wire for external fences. If one erects a barbed wire fence as a boundary between his own field and a neighbour's, and any of his neighbour's cattle are injured by it, he will be liable. So also if he places a barbed wire fence next to a public road, and if such a fence is blown down by a sudden gust of wind, he will be liable to any member of the public who sustains damage. It has even been held that the owner of such a fence adjoining a public footpath is liable to pay damages to a person whose coat is blown by a gust of wind against the fence and torn.

The local authority, if satisfied that a barbed wire fence adjoining a road is a nuisance to the highway, may give notice requiring the wire to be removed; and if it is not removed they may summon the owner before the magistrates. The latter may make an order for the owner to remove the wire, or, if he does not, the local council may remove it and recover the expenses from him. A barbed wire fence includes a fence on which any barbed wire is placed.

FENDER. This piece of household furniture came into use when the open fireplace was abandoned. Fenders are made of brass, steel, or iron, and are either solid or pierced, often with fire irons to match. Some are freely decorated, the Adam style being used as well as other artistic patterns. Apart from these is the familiar kitchen fender.



Fender. Antique examples. 1. Polished steel fender with applied brass ornaments, mid-18th century. 2 and 3. Pierced brass fenders, mid-18th century. 4. Pierced brass fender with serpentine front, late 18th century. (Courtesy of Gill & Reigate, Ltd.)

Of antique fenders the best date from, the 18th century, some being beautiful examples of craftsmanship. Of the four illustrated, No. 1 is of polished steel, pierced with ovals showing roses and thistles, with applied brass ornaments of conventional tulips. It stands on brass ball feet, and dates from the middle of the 18th century. Nos. 2 and 3 are of pierced brass. The former has a middle band of fine tracery and upper and lower bands of scroll work; the latter shows plain moulded bands top and bottom, the centre being pierced in rosette patterns with applied circular bosses. Both stand on paw feet, and are middle 18th century work. No. 4, which is later 18th century, is also of pierced brass. It has a serpentine front, the piercing being in two biers of inter laced arches with a central embossed band of roping.

These designs are copied in modern examples and are more in keeping with a panelled Georgian style room than are the various kind of metal, marbled or tiled flat curbs. With electric and gas fires the tendency is to do away with the fender as a superfluous piece of furniture. *See* Chimney Piece; Curb; Fireplace, etc.

FENNEL. This is a tall, vigorous, hardy and herbaceous perennial. With finely cut ornamental leaves and yellow flowers in summer, it thrives in ordinary soil and takes up a good deal of room. Ferula communis, 5 ft. high, is one of the most decorative: it is increased by seeds or division. Ferula assafoetida and other species supply the assafoetida of commerce. The fennel used for garnishing and other purposes in cookery is foeniculum vulgare, a hardy perennial which can be raised from seeds sown out of doors in early summer. The seeds are employed for flavouring and also in the making of liqueurs.

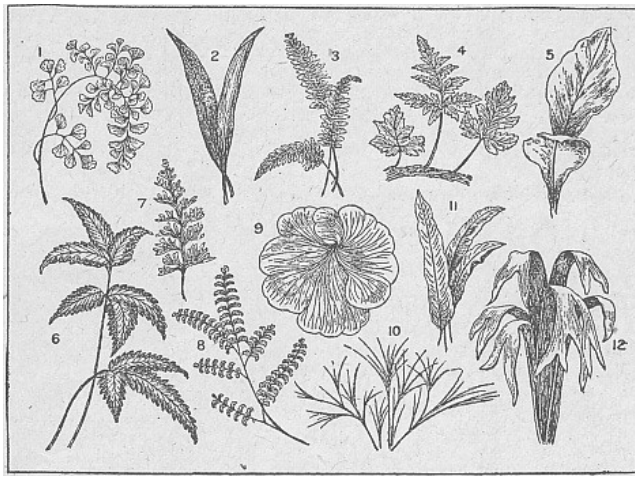
Fennel Sauce. This sauce will give an added flavour to mackerel. Prepare it by picking some fennel leaves from the stalks, washing them thoroughly, and then putting them into a pan of boiling water over the fire. When tender, drain and chop them as finely as possible. Melt 2-3 oz. of butter in another pan, mix in 1¾ tablespoonfuls of flour, and blend the two for a minute or so over a gentle heat.

Take the pan from the fire before adding 1½ pints of milk, then boil up the whole again, stirring all the time. Put in 3 tablespoonfuls of the chopped fennel, together with seasoning to taste, continue boiling for a few minutes, and the sauce is then ready to be served.

FERN: The Varieties. Ferns embrace many species of stove, greenhouse, and hardy kinds, ranging from the wild bracken of woods and common, to the exquisite varieties grown in stovehouse and greenhouse. They are propagated by division of roots, by young buds on the fronds, and by spores. The fronds are wonderfully varied in size, texture and colour, and some idea of their wide diversity of shape may be gathered from the diagram, which shows the following ferns:

1. Maidenhair
2. Niphobolus augustatus
3. Spleenwort
4. Alpine hare's foot

5. Australian spleenwort
6. Silvery brake
7. Tunbridge filmy fern
8. Bird's foot
9. New Zealand fern
10. Actiniopterisradiata
11. Hart's tongue
12. Elk horn



Fern. Examples of fern foliage showing some of the many varieties of frond. A key to the drawing will be found in the text.

Hardy ferns are admirable plants for a shady border providing the soil is moist; they do not flourish in dry ground. There are many crested and tasselled varieties of the male fern, lady fern, hart's tongue and others which are very beautiful in summer and should be planted in preference to the commoner forms. Planting is best done in autumn, though it may be carried out in spring. If the soil is clayey, leaf-mould and sand should be dug in freely and an annual top dressing of leaf-mould or decayed manure in March will do good.

Some ferns do well in room windows, for instance the holly fern (cyrtomium falcatum), pteris cretica and its varieties, asplenium bulbiferum and the ladder fern (nephrolepis). Some of the less vigorous hardy ferns also make good window plants. A suitable compost consists of half leaf-mould or peat with sand added.

There are many charming ferns suitable for cultivation in a heated greenhouse having a minimum winter temperature of about 55 degrees. The ferns must be shaded from hot sunshine in summer and the soil kept moist. The maidenhair ferns (adiantum) are great favourites; some of the most attractive are cuneatum, gracillimum and pacotti. Other suitable ferns are the bird's nest fern (asplenium nidus), lace fern (cheilanthes), squirrel's foot fern (davallia bullata), gold and silver ferns of which the fronds are covered with gold and silver powder, and the ladder fern or nephrolepis. The stag's horn fern (platycerium) is of remarkable appearance with fronds like the antlers of a stag, it is grown in peaty soil fastened on a block of wood or board which is suspended against the greenhouse wall.

The Fernery. An indoor fernery requires comparatively little labour and skill to provide a source of constant attraction. A position where other plants will fail can be utilised, and there is such great variety that it is not difficult to find a large number of the loveliest ferns which will flourish. Give them plenty of root room and avoid any accumulation of stagnant water.

An outdoor fernery built of rockwork is always attractive. Sandstone is preferable for construction. Use the pieces as sparingly and as naturally as is possible, endeavouring to convey the idea that they are cropping out of the ground. Loam, leaf-mould or peat and sand form a suitable compost.

Fern Case. Filmy ferns, which have thin, almost transparent fronds, are very beautiful and can be grown in a closed case in a cool shady greenhouse or in a shady room window. They need very moist conditions, though moisture must not be provided by watering from above. The ferns should be planted in a drained soil compost of sandy peat and loam; it is wise to cover the compost with moss, for this remains moist and thus helps to maintain suitable conditions. The chief filmy ferns are hymenophyllum, trichomanes radicans (Killarney fern) and others. *See* Aquarium; Asparagus Fern.

FERN ROOT. The liquid extract of the root of the male fern is very frequently prescribed for tapeworm, as it destroys the worm and leads to its expulsion from the intestines. The dose of the liquid extract of male fern is 45 to 90 minims; but the drug should only be used under the supervision of a doctor.

Before taking the fern extract the bowels should first be thoroughly emptied by the use of some purgative such as one to two tablespoonfuls of castor oil or a dose of Epsom salts taken overnight. The next morning the dose of male fern is taken on an empty stomach. About four hours later this is followed by a second dose of the purgative, if necessary. The patient should make certain that the head of the worm (and not only portions of the body) has come away, and to help in determining this it has been suggested that the receptacle used should be lined with crape. The head is about the size of a pin's head, and is at the end of a tapering neck. The diet should be light for two or three days preceding the treatment, and it may be advisable to keep the patient in bed. *See* Worms.

Ferric Salts. The name is given to compounds of iron, like perchloride of iron and citrate of iron and ammonium.

FERRIER'S SNUFF. This is an old remedy sometimes used for cold in the head. It consists of subnitrate of bismuth, powdered gum acacia and morphia. A pinch sniffed into the nose allays pain and greatly diminishes the discharge. As this preparation contains morphia, it can only be obtained on a doctor's prescription, and Ferrier's snuff should not be used indiscriminately or too often, or a morphia habit may be developed.

FERRO-CONCRETE. In modern building ferro-concrete consists of a framework or skeleton of

steel encased in walls of concrete. The term is applied generally to any structure made of concrete with internal steel strengthening members. Ferro-concrete is extensively used in all classes of building. *See* Concrete.

FERROTYPE. Ferrotype is a method of obtaining direct positive photographic images very rapidly on thin iron plates or cards. Though principally used by itinerant photographers on seaside beaches and elsewhere, it can be employed to provide entertainment in the home.

The thin iron or cardboard plates are coated with collodion emulsion. A special form of camera is used with a magazine holding 50 or 100 plates. It is so arranged that by working a lever the plate is brought into position for exposure, and after exposure carried into a combined developing and fixing bath. At ordinary temperatures the plate is developed and fixed in about 1 min. or 1½ min. It is then rinsed in water and allowed to dry: the result is a positive image (not a negative as in an ordinary camera), with a not unpleasing appearance. With a reasonably good lens the detail is perfectly sharp and the image clear, although, owing to the iron or cardboard backing, a pure white ground is not possible. Only one copy of each picture is possible, but as it can be produced complete within 2 min. of the moment of making the exposure it is quite feasible to make a series of exposures if a number of copies of the picture is required.

An improved apparatus of this nature is the Prismotype camera. With the ordinary ferrotype camera the image is reversed, so that any lettering that may appear is unreadable. This camera overcomes this disadvantage by the provision of a prism over the lens. Combined fixing and developing salts are sold by the makers of the camera, the formula being a proprietary one.

Insufficient exposure of ferrotype plates gives dark pictures, and too long an exposure gives light ones. If white streaks appear on the photograph development is incomplete, and the plate should be returned to the tank. After the plate has been in the developer-fixing solution for 30 or 40 seconds it is comparatively insensitive to light. *See* Developing.

FERTILIZER. This name is commonly employed for artificial or chemical manures, which are largely used in gardening. The main elements of plant food are nitrogen, phosphates, and potash; and these are present in artificial manures suitable for general use in the garden.

Fertilizers containing nitrogen are sulphate of ammonia, guano, and nitrate of soda. Phosphatic manures are basic slag, bonemeal, and superphosphate. Potash fertilizers include wood-ashes, kainit, nitrate, muriate, and sulphate of potash. Green manures, dead fish, weeds, garden refuse, and animal matter are very rich in plant food essentials, but they need proper preparation by being placed in a heap and turned over occasionally.

Lime and soot are valuable agents; the former is of special value in improving and sweetening soil as well as unlocking inert fertility. Slow-acting fertilizers, such as bone-meal, basic slag, and kainit, are best applied during autumn; and soluble manures as sulphate of ammonia, nitrate of soda, sulphate of potash, superphosphate, and guano, during the spring.

Never apply these fertilizers to sickly plants, as benefit can only be derived during healthy growth. Moderation should govern the use of any fertilizer, as excess encourages rank growth rather than fine crops, and if a proprietary compound is being used careful regard should be given to the instructions supplied by the maker. *See* Basic Slag; Lime; Manure; Potash.

FESCUE. The fescue grasses (Festuca) are often present in the mixtures sold by seedsmen for pastures and sports grounds, and are especially useful for sowing on light land, Festuca glauca, which has blue-grey leaves, is a pretty edging plant.

FESTOON. As used in architecture and on furniture a festoon is an ornament made to resemble a wreath of flowers. The festoon was used by the Adam brothers, and a similar decoration is sometimes found on silver. *See* Adam Style; Anaglypta Christmas; Swag.

FEVER: Its Occurrence. The normal temperature of the human body is 98°-99° F., and anything above that means that fever is present. It is slight if the temperature does not rise above 101.5°; when it rises above 106° there is a state of hyperpyrexia, which may prove dangerous. In cases of fever the temperature usually reaches its highest point in the evening.

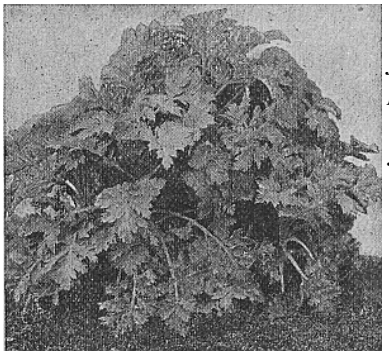
Fever occurs in infectious diseases, and is due to the poisons produced by microbes; in inflammatory disorders, e.g. pleurisy; in some digestive disorders, in heat stroke, etc. There are certain symptoms which are found in association with a rise of temperature, whatever its cause. The patient feels out of sorts, and there may be a general soreness or aching, headache and backache. Children frequently have convulsions at the beginning. Sleeplessness is common, and delirium may be present. The mouth feels dry, there is thirst and usually constipation. The appetite is impaired, and there may be nausea and sickness. The pulse rate and the breathing rate are increased.

Unless the fever is slight the patient should be put to bed in a quiet room. The diet must be liquid only, diluted milk, etc., and water or fresh lemonade may be drunk freely. The following remedy will help to keep a mild attack of fever in check. The dose for a child is 1-2 teaspoonfuls every 3-4 hours, for an adult 2 tablespoonfuls every 3 hours. In the case of children half the mixture only should be given at a time.

Sweet spirits of nitre	½ oz.
Solution of acetate of ammonia	2 „
Syrup	1½ „
Water	4 „

When the temperature tends to be high, or the patient is restless or delirious, the body should be sponged with tepid water, a part only being exposed at a time; or a cold pack (q.v.) may be employed. The treatment should be supervised by the doctor, and until it is clear that there is no infection the patient should be isolated. *See* Infectious Disease; Scarlet Fever; Thermometer; Typhoid Fever, etc.

FEVERFEW. The popular name of chrysanthemum parthenium (known also as matricaria or pyrethrum), of which the double flowered variety is a useful garden plant, 2 feet high, bearing a profusion of small double white flowers. It will thrive in shade and sow itself freely. The name feverfew is also applied to that popular bedding plant, golden feather.



Feverfew. Golden feather, or feverfew, a popular summer bedding plant with yellow leaves.

FIBROID. Fibroids of the uterus are tumours composed of muscle and fibrous tissue which may arise in any part of that organ, but are most common in the body of the uterus.

The commonest symptom is excessive loss of blood at the periods, and it is of great importance that advice should be sought early. The tumours enlarge just before the menstrual periods, and the occurrence of difficulty in passing water for 2 or 3 days before a period should incite suspicion of their presence.

The period of maximum frequency is between the ages of 35 and 45. Although the presence of a fibroid or fibroids may not prevent conception, it nearly always renders dangerous, and sometimes impossible, the birth of the child, or even its development to full time. If the growth becomes infected by germs, general blood poisoning and the death of the patient will ensue. The only treatment of any avail in the great majority of cases is the removal of the uterus.

Fibroma. *See* Tumour.

FIBROSITIS. This term is applied in medicine to swelling of fibrous tissue from inflammation and is the condition present in muscular rheumatism, where the fibrous sheaths and intersections of the muscles are affected. Where the swellings occur nerves may be compressed or dragged upon, and this is especially so when movements are made, hence the acute pain associated with this complaint. The lumps can sometimes be felt.

Fibrositis may follow exposure to cold and damp, injury or poisoning from sepsis in the mouth, intestine or elsewhere. In some cases rest in bed is necessary. Aspirin may be useful in relieving the pain, and the bowels should be cleared with a dose of Epsom or Rochelle salts. A course of sulphur may also be beneficial. Heat, either in the form of a hot water bag or of poultices or fomentations will be found comforting. Massage is an all-important part of the treatment, and after the rubbing the patient should make such movements of the part as are possible without pain, and in most cases he rapidly gains freedom in doing this. To prevent recurrences he should keep a clean mouth, pay attention to the regularity of the bowels, and by extra clothing, etc., take precautions against exposure. *See* Lumbago; Massage, etc.

Fibula. *See* Leg.

FIDDLE PATTERN. Tablespoons and forks are very often made in this pattern, which came in vogue in the 19th century. Its main features are the round end and straight side, the handle having sharp corners where it rounds away into the stem. *See* Fork; Spoon.

FIDGETS. Elderly people frequently suffer from sleeplessness and troublesome fidgets. This is probably due to a general failing of all the organs, which hinders the purifying processes of the blood. The patient should eat very moderately and be kept a good deal in the open air, even when unable to take much active exercise. An occasional warm (but not hot) bath before going to bed will soothe the nerves.

A form of fidgets to which other than elderly people are prone is due to muscle fatigue, the limbs feeling nerveless and out of control. The treatment noted above may give relief, but if not, a doctor should be consulted.



Fig. The ripe fresh fruit highly prized for dessert.

FIG: Growing and Cooking. The edible fig is borne upon hardy trees of varying sizes belonging to

the genus Ficus, of which the indiarubber plant is a member. Except in mild districts, figs are best grown under glass, or on a sunny wall. They strike readily from cuttings of ripe wood placed in sandy soil, in bottom heat in late autumn. When rooted, the young plants should be given separate pots, and then either repotted as required if they are to be fruited under glass, or planted out against a wall. As the habit of the tree is naturally gross, rich soil must be avoided. If the soil is deficient in lime, mortar rubbish or chalk may be added liberally, and the soil rammed well down. Propagation may also be effected by drawing suckers away from the base of established plants. Pruning, which is done in summer chiefly, is directed towards preventing overcrowding. Suckers (shoots that grow from the base) should be pulled up. The best variety for general cultivation is Brown Turkey.

How to Cook. The fresh fruit of the fig-tree is useful for dessert. These are always called "green figs," and are sometimes made into jam, or a compôte cooked as follows: To about ¾ pt. of water add ½ lb. of sugar, and let them boil together for about 10 min. Add 1-1½ lb. of figs, and simmer them slowly until they are tender. Then take them out, and let the syrup boil briskly until reduced to about ½ pt. Pour it over the figs, and leave them to get cold. Lemon peel added to the water, and a little lemon juice or wine added when the fruit is soft, will improve the flavour.

In stewing, use the small figs, and soak them overnight in cold water. Then put into an enamelled saucepan 4 oz. of sugar, 1¼ pint of cold water, and the thinly peeled rind of a lemon. When the sugar is dissolved, add 1½ lb. of figs, and stew them slowly for about 1½ hours. They are usually served with a milk or custard pudding. If liked, the juice of a lemon may be used as flavouring for the figs instead of the peel.

The fruit for eating as dessert should be quite ripe, and must not be kept too long or it loses its delicate flavour and bloom. The finer kinds of dried or Turkey figs serve also as a dessert dish. In appearance they should be slightly moist, and have a whitish tint outside and a rich yellowish brown inside. The smaller figs are drier in appearance, but should be clean and without black patches. They are mostly used for stewing, and are useful for various kinds of puddings. They may take the place of raisins in a cake, and in that case should not be soaked in water.

Fig Cake. A rich cake can be made by sifting ½ lb. of flour with a pinch of salt, J teaspopnful of ground ginger, and ¼ teaspoonful of baking powder. In a separate basin cream 3 oz. of lard and 2 oz. of butter with 5 oz. of brown sugar, adding the rind of ½ a lemon. When these ingredients have been well worked, add 3 eggs one by one, and beat them well in. Clean and cut up into small dice ½ lb. of figs, add them to the flour and then mix them with the butter and eggs, taking care to work the dry ingredients in lightly. Lastly, add ½ gill of sour milk, turn the mixture into a lined cake-tin, and bake it for about 1¼ hours.

Fig Jam. To make fig jam, weigh some small green figs, which should not be quite ripe, wipe them, and score them across the top. Lay them in a brine of salt and water for 10 days, then wash them and boil them in fresh boiling water till a skewer will easily, pierce them. Put the figs into cold water and leave them for 4 days, changing the water each day. For every lb of figs bake 1 lb. of granulated sugar and make it into a syrup, allowing one gill of water to every lb of sugar. Cool the syrup after straining it, pour it over the figs, and leave them all night. The next day boil the jam till the fruit is quite clear, put it into jars and tip it down securely. *(See* Jam.)

Fig Pudding. Chop ½ lb. of dried figs very finely, and add to them ½ lb. of breadcrumbs, 4 oz of finely chopped suet or dripping, and 4 oz. of sugar. Beat up 2 eggs, pour them, with a good breakfastcupful of milk, over the dry ingredients, and mix well. A little grated nutmeg or powdered allspice might also be added. Turn the mixture into a well-greased pudding basin, twist some greased paper over the top, and steam it for about 4 hours.

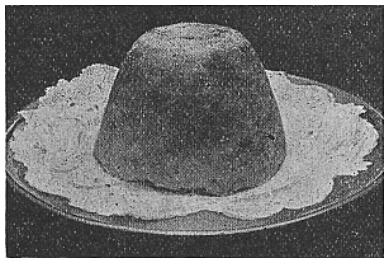


Fig Pudding. Another variety can be made by using equal quantities of chopped figs and raisins.

FIG MARIGOLD. Few of the mesembryanthemums or fig marigolds are hardy in Great Britain except in specially favoured places. One of the hardiest is the ice plant, Mesembryanthemum crystallinum, an annual which is raised from seeds under glass in spring; it has succulent stems and leaves and white or red flowers in summer and should be planted in a sunbaked spot. One named Mesembryanthemum cordifolium variegatum, with green and yellow leaves, is often used in carpet bedding; it is, raised from cuttings in a frame in August. In spring and summer the points of the shoots must be pinched off several times to keep the plants dwarf.

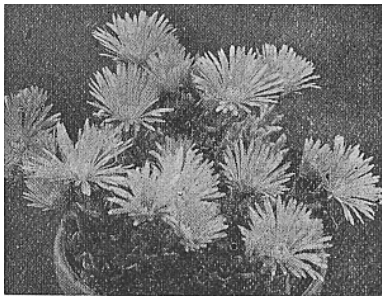


Fig Marigold, annual suitable for a sunny garden.

FIGURE: How to Improve. The foundations of a

good figure are laid in early youth. With ordinary health, if hygienic rules have been observed, a strong, graceful body may be developed which with a little care will retain correct lines.

Diet, fresh air, proper breathing, sufficient relaxation and exercise all contribute toward moulding a good figure. Outdoor games should be encouraged for normal children to develop healthy growth of bone and muscle. Swimming and classical dancing, particularly in the open air, are especially beneficial as they exercise every muscle with rhythmic perfection. Skipping improves breathing, balance and carriage. Tennis, when played vigorously, is a good form of exercise.

While perfectly controlled muscles are essential, over-development of these to some extent destroys elasticity and coarsens the limbs. To acquire symmetry and to preserve the good lines of the body a short course of exercises, which flatten and strengthen the back and abdomen, deepen the chest and keep the body supple, should be performed daily. Suppleness and symmetry are the keynotes of beauty. They mean fluent grace of line and movement.

Suitable Exercises. In addition to the exercises given under Beauty Culture and Breathing, the following three would make up the daily dozen of an excellent course suitable for either sex.

(1) A lunge exercise is good for all the muscles of limbs and trunk. Stand erect with hands on hips. Take a step forward with the right leg, bending the right knee. At the same time lunge forward and upwards with the right arm to the full extent, following the arm with the eyes. The left arm is simultaneously carried backwards and downwards. Spring back to the original position, then lunge with left arm, bringing the left leg forward. Spring back and repeat the exercise, lunging with right and left arms alternately.

(2) This exercise should be practised gradually. Lie flat on floor, face downwards. Support the weight of the body on the toes and hands, palms flat on the ground at the side of the body, fingers pointing forwards. Raise the body by straightening the arms and keeping the trunk rigid without bending at the waist. Slowly lower the body and try to touch the floor with the chin. Raise and lower the body alternately, touching the floor only with the toes, the palms of the hands and the chin. This is a splendid exercise for the arm, thigh and abdominal muscles.

(3) Stand with feet apart, arms extended to the sides at shoulder height, palms downwards. Bend the body forward from the hips until at right angles, keeping the knees stiff. Then bend down and touch the ground between the feet with the right hand, left arm raised to a vertical position above head, keeping the body bent the whole time. Repeat ten successive movements each side. Digestion is stimulated by this exercise, the liver and kidneys toned up by using the back muscles, and, in addition, the abdominal muscles strengthened.

Do not hold the breath during the exercises, but breathe deeply and evenly throughout. The movements should be repeated until there is a slight feeling of fatigue. It is surprising how speedily strength is improved by persistent practice. *See* Beauty Culture; Breathing Exercises; Diet; Obesity.

FIGURE OF EIGHT MOTH. Although this moth is exceedingly common and fairly large, it rarely comes under the notice of the gardener; but the caterpillar is often evident to him. The perfect insect is less than 1½ in. in the spread of its greyish-brown forewings, which bear the distinctive mark from which the moth takes its name. There are two whitish blobs on each wing, and the one nearer to the base of the wing takes the shape of a crudely formed 8. Flying by night, it is rarely seen, except occasionally by watching the street lamps which attract it. The eggs, laid in September, hatch about April, and the caterpillars which out in the open feed upon hawthorn, blackthorn and crab, in the garden attack apple, plum and other fruit trees. They often appear in great numbers, and may be recognized easily by their characteristic blue backs which have a yellow line down the middle. Each segment of the body of this moth bears four black warts on the back, and the warts bear bristles.

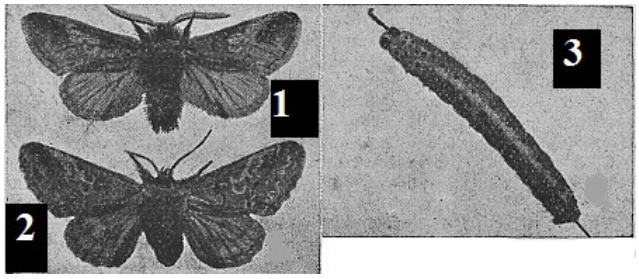


Figure of Eight Moth, an orchard pest.
1. male; 2. female; 3. caterpillar.

By late June the larvae are full grown—about 1¼ in. long; but they are large enough to be noticeable early in May. When full-fed they descend the trunk to spin a cocoon near the ground, attached to the bark or sticks or stones. As soon as their presence is detected, a large sheet of some sort should be spread under the tree where they are thickest, and the branches should be jarred by rapping them sharply with a stout stick, bringing the caterpillars down in a shower.

FILAMENT: In Wireless Apparatus.

In a wireless receiving valve of the battery operated type the filament is a metal wire enclosed by the grid and anode. Upon being heated by the flow of current from a low tension accumulator the filament emits electrons from its surface. In this type of valve the filament constitutes the cathode, in contrast to an indirectly heated mains valve, in which the filament (i.e. heater), and cathode are separate.

A directly heated mains valve is fundamentally similar to a battery valve, but the electron-emitting filament is heated by the mains current. The difference is that whereas the resistance of a battery valve filament is kept as high as possible in order to reduce

current consumption to the lowest practical level, that of a directly heated mains valve is low to minimise hum of voltage variations.

The filament of a modern battery operated valve is usually connected direct to a low tension accumulator of suitable voltage, the current supply being controlled by an "on-off " switch inserted in either the positive or negative leads. *See* Cathode; Valve.

FILBERT. Belonging to the genus Corylus, the filbert will flourish in ordinary well drained soil. On the chalky soil of Kent the filbert flourishes excellently, and it may be used as a hedge, instead of privet or thorn, or as a screen, or in groups. The tree may be raised from nuts planted in the autumn, or from layers or suckers. Popular varieties are white-skinned, red-skinned, Webb's prize, and Cosford. The best crops are obtained from trees that are closely pruned to the shape of a vase. Pruning must not be done until after the catkins have faded: side shoots, other than those bearing the small red-tipped female flowers, are then shortened.



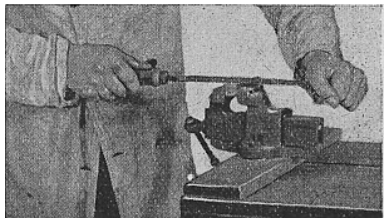
Filbert. Leaves and fruit of a tree useful to the gardener.

They are best freshly gathered, and will then peel easily when removed from the shell. To blanch the nuts for cooking, or any other purpose boil the shelled nuts for a second or two, then turn the kernels into a clean rough cloth, and by rubbing remove the brown skins. *See.* Nut.

FILE: Its Uses. A file is provided with a spike called a tang at one end, to which a wooden file handle can easily be fitted. When in use, the file is grasped by the handle in the right hand, with the length of the file pointing forward across the top of the work to be filed; the finger tips of the left hand are laid down on the top of the file close to the point end. Vertical downward pressure is applied equally with both hands, and at the same time the file is driven forward in the direction of its length by force exerted principally by the right hand. On the recovery stroke the downward pressure is entirely relaxed, or the file may be lifted off the work.

Exert the downward pressure principally with the left hand at the commencement of the stroke, transferring it gradually during the stroke, so that at the finish of the stroke the principal pressure is exerted by the right hand. This must not be overdone, or rounding instead of flatness will appear; properly done, the gradual transferring of the duty of pressing down from the left to the right hand just keeps the file dead level, and level work is the result.

It is essential for the work to be held in a vice or otherwise rendered absolutely as firm as possible. The above description applies particularly to the use of a flat file on a flat surface *(see* illustration).

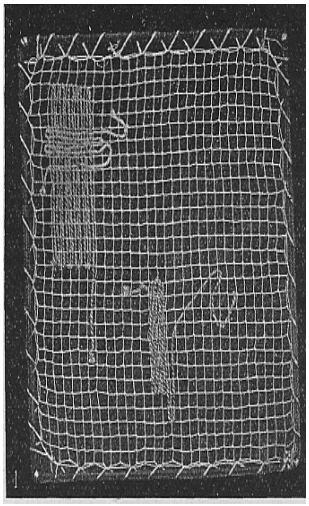


File. Correct position in use: thumb on handle, weight on both arms, file horizontal.

Files are classified according to size, shape, and roughness of surface. The only shapes which are required for daily use are known as hand, half round, square, round, and three square. The grades of roughness are known as rough, middle, bastard, second cut, smooth and dead smooth. The amateur will find the following assortment of files useful: a 10 in. bastard, an 8 in. second cut, and a 6 in. smooth hand file, an 8 in. second cut half-round, an 8 in. and a 6 in. second cut square, an 8 in. and a 6 in. second cut round, and a 6 in. second cut three-square file.

FILET LACE WORK. This lace derives its name from the French filet or net which forms the background on which the pattern is darned. It is a square mesh varying in size from 1/16 to ¼ in. for the standard filet nets, although larger meshes have become fashionable for window curtains, table centres, cushions, chairbacks, and other articles of the kind.

Real filet lace has a hand-made background made with the ordinary netting stitch used by fishermen, but with a much finer needle and mesh, a round steel knitting needle being used for the latter where a mesh of less than ⅛ in. is required. Many English filet laces are worked on a machine-made background, the designs being darned on the net by hand.



Filet Lace. Fig. 1. Showing hand-made net attached to wire frame, and method of making darning stitch.

Fig. 1 shows a square of hand-made net lashed firmly to a square filet frame of thick wire, bound with green silk. With a small piece of work, the ground net should be sewn to strong calico, and the latter sewn or lashed to an ordinary frame bound with strong calico. A round embroidery frame could be used for small motifs, by sewing the latter to a piece of

material each side so that the net in the middle is quite free.

The stitch employed is the ordinary darning stitch, passing the needle under and over the meshes of the net in an up-and-down direction until the space is filled. A specimen of this is shown in the lower part of Fig. 1.

The most expensive filet laces are worked in cloth darning, shown in the top left corner of Fig. 1. To do this, darn up and down as described above, but work only half the number of threads required to fill the space, then darn in the opposite direction, going under and over every thread in turn, including the net background.

FILLET: Of Meat and Fish. *See* Beef; Fish; Mutton; Veal, etc.

FILM: In Photography. Celluloid films have many advantages as compared with glass plates. They are lighter, not liable to breakage, and less liable to halation than unbacked glass plates. In the roll form as cartridges for daylight loading they are extremely convenient for snapshot work. Roll films suffer from a liability to longitudinal scratches, probably caused by rolling too tightly; care should be taken when the film is in the camera to see that both top and bottom spools revolve easily.

Modern super-speed films are of many different varieties. One or two still make negatives by full exposure and normal development that are on the soft side. But at least two of Continental make give distinctly vigorous negatives. The amateur photographer should stick to one make whose peculiarities he understands. Both auto-chromatic and high speed panchromatic roll films are now obtainable.

Films are also available in flat form, six or a dozen exposures being carried in a film pack. These are exactly similar in characteristics to roll films, but are designed for use with plate cameras. For more advanced photographers flat films of a stouter kind are made which have all the advantages of plates and none of their disadvantages. These flat or cut films are carried separately in plate holders or dark slides.

Lately, however, photography has been revolutionized by the use for miniature cameras of standard cinematograph film whose emulsion uses the whole experience of the cinema and photographic industries. In general, films are so convenient that the Kodak company temporarily abandoned the manufacture of glass plates, whether for amateur or professional use. These plates, however, may shortly be reintroduced.

As films are more liable than plates to surface damage by scratches and finger marks, it is a sound plan to harden them by immersion for ¼ hour in a solution of one part of formalin in 25 parts of water. After removing the surface water with fluffless blotting paper the film can be dried before a fire. If dried thus without hardening it would melt.

The Clearing Bath. Stains on a film caused during development, both on the front and sensitive side and on the gelatine back, can usually be removed by a clearing bath. The film should be thoroughly washed to get rid of the slightest trace of hypo, and then immersed in the following solution:

Alum	2 oz.
Citric acid	½ „
Water	20 „

If chrome alum is used the quantity should be ½ oz. and 1 oz. citric acid. This solution can be used two or three times, and it brightens the negative considerably. To remove the film from useless glass or gelatine negatives, soak them for several hours in strong soda water and place them in water which is nearly boiling; they should then come off quite easily.

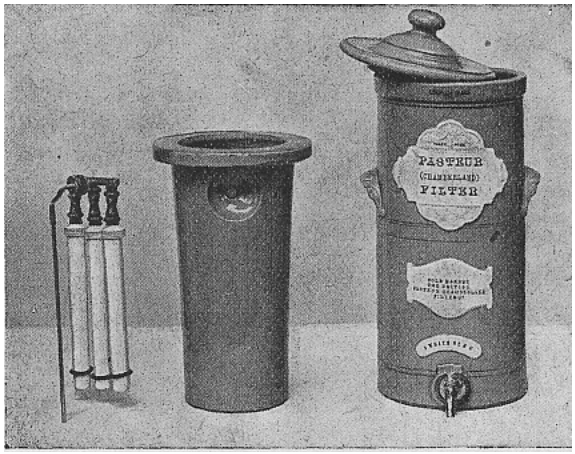
The "multi-coated" film consists first of a comparatively slow emulsion capable of giving considerable density and of recording a very wide range of contrast. On top of this is a thin emulsion of high speed, which responds to illumination far too faint to produce any developable change in the slower emulsion. Yet the "multicoated" film has a disadvantage: it produces slightly blurred pictures; and many photographers to whom the utmost possible sharpness is a vital matter are returning to a single-coated film. *See* Cinematography; Developing; Fixing; Negative.

FILM PACK. This is a means of using flat films in a plate camera with the advantage of daylight loading. Six or 12 films are placed together in a cardboard holder, each film being backed with black paper, the end of which projects at the top of the pack and carries a number. The whole pack is placed in a film-pack adapter fitted to the particular camera, taking the place of the ordinary dark slide or plate holder. When a film is exposed it is changed by pulling out the numbered tab steadily and without excessive force: this pulls the exposed film round a roller at the bottom of the pack so that it is changed from the front to the back of the pack, and the next film is ready.

When the last paper tab is pulled out a shield is brought in position in front of the last exposed film, protecting it from light and allowing the whole pack to be removed from the adapter in daylight. If it is desired to develop single exposures the adapter containing the pack can be taken into the dark room and the required films removed, care being taken to close the pack properly before replacing. *See* Developing; Fixing; Photography.

FILTER: For Drinking Water. When drinking water is suspected of being contaminated it should be carefully filtered before use. As an extra precaution, it is well to boil it first. Water loses its contained air by boiling and becomes flat, but the process of filtration restores more or less air. The water supplied to city people is thoroughly filtered, but in country districts, where the supply comes from wells and streams, the process must be carried out in the home. Where disease

germs are present, however, reliance should not be placed on filters; the best safeguard is to boil drinking water.



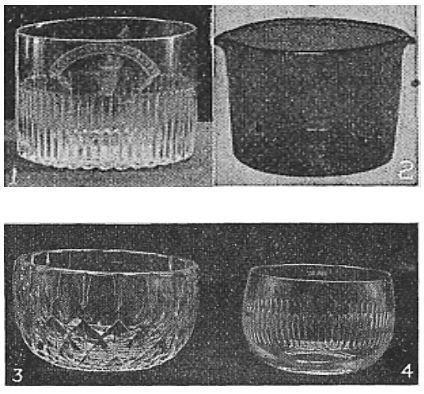
Filter. Fig. 1. A non-pressure type, showing upper and lower chambers and (left) filter candles. (Courtesy, Pasteur Chamberland Co.)

Several filters suitable for use in the home are on the market. The Pasteur Chamberland is made in several types, the largest being pressure filters for attaching to the main water supply. A smaller one, of the non-pressure type, made to stand in the house, is of earthenware or enamelled iron. Its size varies, the largest being able to deal with 16 gallons of water a day and the smallest with three. A filter of this kind is illustrated in this page.

Another useful type is the silicated carbon filter, made in various sizes and styles.

FINGER BOWL. Finger bowls may be of plain or cut glass, those of the former type being often coloured. If coloured ones are used they should harmonise with the dessert service and the table decorations generally.

Finger bowls of old glass can occasionally be purchased, and are usually of greater beauty than modern ones. Some are of the double-lipped type, and are found in a variety of patterns, cut and engraved. More rare are the barrel-shaped ones, austerely decorated with raised lines. *See* Glass: Table Laying.



Finger Bowl. 1. Early moulded Irish finger bowl, c. 1780. 2. Bowl of Bristol blue glass with gilded edge, c. 1800. 3. Irish cut glass work, c. 1800. 4. Finger bowl decorated with flute cutting, c. 1820-30 (Courtesy of Cecil Davis).

FINGER STALL. Rubber finger stalls may be bought from any chemist, but ordinary ones can be made from an old pair of gloves. Cut off the glove finger corresponding to the finger for which the dressing is required, leaving a triangular piece of material extending from the base. This is then pierced and a piece of tape inserted. The tape should be long enough to cross over the back of the hand and take a turn round the wrist, being then fastened. *See* Bandage; Dressing.

FIR. This name is commonly used in reference to various conifers, e.g. abies, picea, pinus and others.

Fir Cone. Fir cones make excellent fuel for an open grate. They should be collected and dried, and then stored in a log basket. When the fire has burned up well and is bright and clear, put on the cones. They burn briskly and give out a pleasantly fragrant smoke.

A large fir cone makes a reliable weather glass. It should be hung up in the porch or hall. When wet weather is to be expected the cone will close up tightly, owing to the moisture in the air. When a spell of dry weather is coming the cone will open and spread out. *See* Deal; Fire; Fuel; Wood.

FIRE: How to Lay. Much depends upon the correct laying of a fire, but no difficulty should be experienced if a sufficient supply of dry wood is kept ready for use.

The kitchen fire is generally the first to be lighted in the morning, by raking out the dead cinders and ashes from the grate, placing crumpled paper in the bottom, with the finest kindling on top of it. Upon this is placed slightly larger wood, with a fairly large piece, and a few knobs of coal on the top. The top of the range should then be replaced, or the kettle placed over the opening, the dampers adjusted correctly for draught, and a match applied to the paper. The paper may be saturated with paraffin oil before it is placed in the grate; to tip paraffin over the whole fire is risky.

In the case of an anthracite stove, the same procedure may be followed, except that, instead of the damper, the small door at the bottom of the stove should be opened when the fire has been lit, in order to provide more draught, and a fairly large quantity of anthracite placed on the wood. For open grates no damper is provided, but the grate is generally larger, and more wood can be laid on it. Open grates are more common in the country, and a wood fire is easily made up before coal is placed upon it. The same procedure may be followed in the case of barless stoves and fireplaces, although in the latter case it is generally wood that is burnt.

Where the fire is open, that is, not enclosed, as in a range or slow combustion stove—care should be taken to see that the register is opened before the fire is lit, or the room will be filled with smoke. Essentials are that there shall be room for the flames from the paper and kindling and a sufficiency of air for proper combustion, for which reason there must be a space for the air to get through. It is useless trying to light

any fire if the kindling be so tightly packed that the air cannot pass all through it, a good draught being a great help to speedy and effective fire lighting.

Fire Lighter. Special compositions, generally of pitch and sawdust, are sold for fire lighting. In some cases the composition is placed on kindling wood all ready for use, and in others it is sold in blocks, divided up into squares, one of which is used at a time. They are very useful when the kindling wood is damp, but care should be taken that they are stored in a place that is not greatly exposed to heat, as they are liable to catch alight.

Pine cones are converted into fire lighters by soaking them in a mixture of 8 parts of resin to 1 part of tallow. This is done while the mixture is hot; the cones are improved by sprinkling them with sawdust. As they are very inflammable they should be stored in a safe place, preferably out of doors, but protected from the elements. *See* Anthracite; Coal; Gas; Grate, etc.

FIRE: Precautionary Measures. One of the first duties of the householder is to ensure that proper precautions are taken against fire, and while much has been done by legislation so far as the building of the house is concerned, the interior arrangements must be carried out by the inmates themselves. Various safeguards and emergency measures to be adopted in case of fire are outlined in this article, together with a brief description of some of the fire appliances on the market. Such measures include the provision of extinguishers and ladders, the immediate closing of doors and windows, and the application of water, sand, or a chemical extinguisher.

Open fireplaces ought to be protected by an efficient fireguard at night, or on occasions when the house is left unattended for any length of time. The storage of inflammable oils should be in an outbuilding, and not in the house itself. Oil used for lamps should be kept in a safe place away from any heat, and the lamps themselves wiped dry at the time of refilling. Candles and nightlights should never be left burning unless properly protected by a holder of adequate size or housed in a candlestick with a glass shade. Never put a lighted lamp in any position where the heat from it may be a source of danger. A lamp is usually alight for a considerable time, and while the heat at the start may not amount to much, the cumulative effect may be enough to scorch, and finally to fire, adjacent woodwork. The airing of clothes at an open fire should only take place under supervision, as a cat or a dog may easily overthrow a clothes-horse and cause a fire. Another wise precaution is the provision of metal ash-trays: many fires have started from a dropped cigarette-end.

Importance of Instant Action

The greatest safeguards against fire are those which can be quickly applied. Speed is everything; the biggest fire starts as a tiny one, and therefore if a fire occurs act at once. A tumblerful of water applied at the instant of the outbreak may suffice, or the prompt application of a thick rug or mat.

If the bedroom curtains catch fire, seize a pillow and beat out the flames, and if assistance be at hand, let the doors and windows be at once closed, and apply the water from the toilet jugs thrown forcibly into the heart of the fire. An outbreak can sometimes be suppressed by the prompt application of a wet blanket.

When it is necessary to enter a burning building it is better for two persons to go in company, so that if the first is overcome by the smoke the other may be able to effect a rescue. If the smoke is very dense the entrance should be made on the hands and knees. A wet handkerchief, towel, or a damp sponge gripped in the teeth is an aid to breathing, as it acts as a sort of filter for the air.

Many excellent fire-fighting appliances are on the market, and their purchase should be looked on as an investment. The chemical extinguishers are probably the most effective for domestic use. They are made in many sizes and types, but those of two or three gallons capacity are as good as any in an ordinary house. They work in various ways. In some there is a handle to be turned; in others the appliance is turned upside down, struck a blow on the floor, and the liquid at once directed into the heart of the fire. Whatever the type adopted, its method of use should be demonstrated in the presence of all those normally resident in the house, so that all may be familiar with it. The appliance should be kept in a well-known and accessible position.

Insurance Against Fire. A policy insuring a house and its furniture against fire should be taken out by every householder. The rates vary, but 1s. 6d. for each £100 insured is a fair average. It is more economical in most cases to take out a policy that covers other risks, e.g. burglary and employers' liability as well.

A fire insurance policy is essentially an agreement in good faith. A failure to disclose any material fact necessary to estimate the risk properly vitiates the policy, and the same is true if anything is done without permission of the insurer whereby the risk of fire is increased after the contract has been made. The risk of fire as a result of invasion, riot, strikes, or civil commotion is not covered by an ordinary fire policy.

Fire insurance policies are issued either subject to average or without average, and those who take one out should make inquiries on this point. In the former case, if the full value is not insured, the insurer must bear a proportion of the loss. For instance, A insures his house for £1,000, but its total value is £2,000. A fire damages it to the extent of £800, but the insurance company will only pay him £400, or half the amount of his loss, as his house was only insured for half its value. If, however, property is insured without average, the full amount of the damage is payable up to the limit of the amount insured. *See* Insurance.

Fire Alarm. Fire alarms are of two classes. Those installed in the public streets are set going by breaking

the glass and pulling a handle or knob; an electric circuit is completed, and a bell rings in the fire station. Those installed in the building to be protected are of two kinds, those which merely indicate that an excessive temperature has been reached in some part of the building, and those which release a jet of water about the place where the fire is.

The first kind generally consist of mercurial thermometers. When the mercury reaches a predetermined limit it will touch a wire fixed in the glass and thus complete an electric circuit which causes a bell to ring or a steam whistle or "syren" to go off. The second consists of fusible metal disks which are fixed generally in the ceiling, and melt when a dangerous temperature is reached in their neighbourhood, letting down a spray of water; an audible alarm is usually combined with the disk apparatus.

FIREBRICK. Firebricks are manufactured from various kinds of earth and treated to render them fire resisting. Moreover, they have the property of radiating heat, and are an excellent non-conductor of heat. For this reason it is an ideal material for the back of a fireplace, or any other location where great heat has to be resisted.

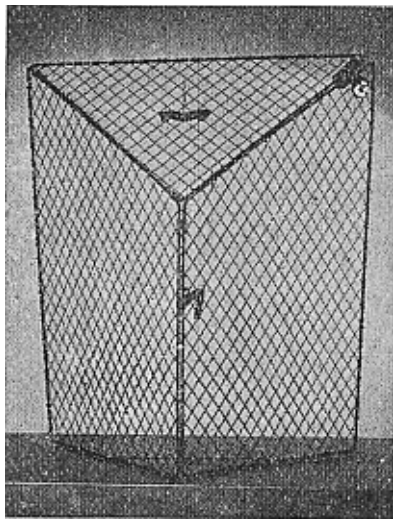
Firebricks are obtained in a wide range of sizes and shapes. Modern grates which are made on the barless principle often have a firebrick back extending the full height of the grate. *See* Grate.

FIREBUSH. This is the common name of Crataegus pyracantha, a type of evergreen hawthorn, bearing white flowers in May, followed by bright scarlet berries in autumn. Ordinary soil is suitable for the firebush, but a sunny aspect away from the shade of other trees is desirable. There is a superior variety called Lelandi, of more compact growth, and bearing dark-green leaves with clusters of white flowers, followed by bright orange-scarlet berries.

FIRECLAY. A variety ot clay that will withstand extreme heat is used in making firebricks, for setting parts of a grate or stove, and for other purposes where resistance to great heat is essential. The best qualities come from the neighbourhood of Stourbridge. It is obtained in powder form, has to be moistened with water, and applied in a plastic state with the aid of a trowel, or pressed into place with the fingers, according to circumstances.

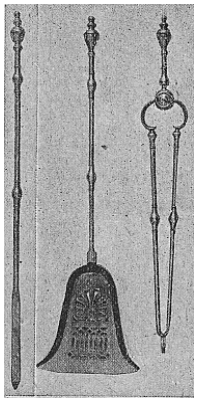
Many excellent compositions are on the market that have fireclay as a base. They are sold under different trade names, and have much to recommend them for amateur use as, being purchasable in small tins, they are economical in use and of a proper consistency for such work as the repair of a damaged fireplace. Fireclay is very useful for luting the joints around a stove-pipe, for making good any defective places in an anthracite stove, or in fact any place which is subjected to the heat of a fire. *See* Firebrick; Grate.

FIRE GUARD. An essential piece of hearth furniture where there are children, a fire guard is also useful as a protection against flying sparks which might cause damage during absence from a room after a fire has been lighted. A useful form which will save many anxious moments in the nursery is of wire netting and shaped so that it completely masks the grate opening. By the Children Act, 1908, any person over the age of 16 years who has the custody, charge or care of any child under the age of 7 years is liable to a fine of £10 if he allows that child to be in any room con-taining an open, fire grate that is not sufficiently guarded so as to protect the child against the risk of being burnt or scalded— that is, if the child actually suffers serious injury or is killed. It is a defence that the adult person in charge took reasonable precautions against the risk; as, for example, by having someone else in the room to look after the child. It may even amount to manslaughter to leave a child in a room with an open fire grate left unguarded.

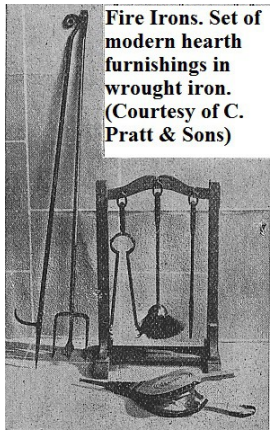


Fire Guard in wire, essential in the nursery (Courtesy of Selfridges).

FIRE IRONS. These articles, used for tending a fire, consist of poker, tongs and shovel. They are usually sold in sets to match the fender or other fittings, and some sets include a hearth brush. They are made of brass, iron and steel; also of copper and oxidized silver. The older types of fire irons rest on two fire dogs, a development of the old andirons or dogs, but a modern fashion is to hang them from a stand made to match. Newer than a stand with the implements clustered round it is the wrought iron frame, with tongs, poker, hearth brush and bellows all to match the log irons, as shown in the illustration.



Left, fire irons in Adam style in polished steel, 18th century (*Courtesy of C. Pratt & Sons)*



Fire Irons. Set of modern hearth furnishings in wrought iron. (Courtesy of C. Pratt & Sons)

These oldest existing examples, known of log irons, were implements used for moving logs from the fire, consisting of a fork and a roller. Smaller ones of similar type came later into use. Afterwards fire irons were designed in the Adam style, and a beautiful set is shown here. These are of polished steel with engraved urns on the top of the handles. The panel of the shovel with its honeysuckle decoration is in keeping with the remarkable grace of this set.

The methods of cleaning and caring for fire irons vary to some extent with the metal. Polishing is necessary from time to time, and those in unoccupied rooms should be guarded from damp. *See* Andirons; Coal Box; Poker; Tongs, etc.

FIREPLACES, HOMELY AND BEAUTIFUL

Principles of Design and the Best Styles Described

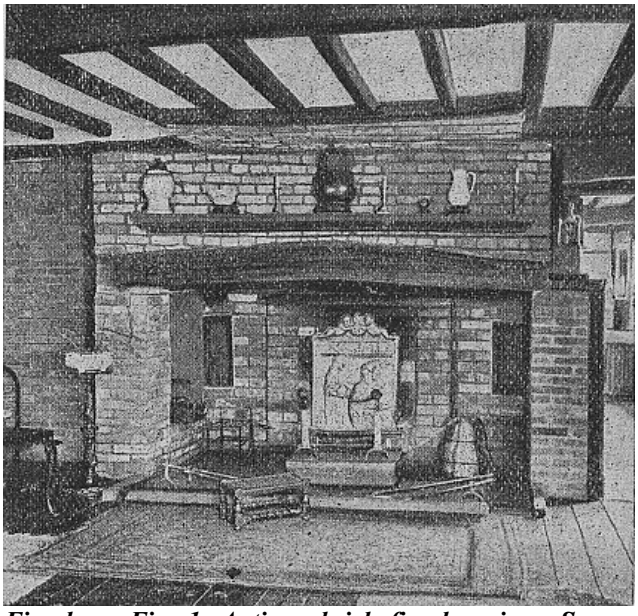
For related information see Anthracite Stove; Chimney Piece; Grate; Range. See also Cottage; House; and the entries on Coal; Coal Box; Curb; Fender; Fuel.

Fireplaces are so linked up with traditions of British home comfort that, whatever the methods of heating used to supplement them, there is little likelihood of their going out of fashion in living-rooms. This is particularly the case with forms of fireplaces which are structurally good and designed in fabrics eminently suitable for their purpose.

Brick fireplaces endure for several reasons. They are right in many styles of rooms and different periods of architectural decoration; they suggest complete comfort and please the eye. The warm tones and harmonious colours of good bricks, combined with their delightful texture, render them a particularly suitable material when built up in simple but effective designs. British brickwork has had a good revival in this century, and for fireplaces mixtures of old English 2 in. handmade bricks are often chosen, which are well burned to a pleasing variety of tints. In many of the newer houses the bricklayer has put his craft to a specially artistic use in carrying out excellently designed fireplaces.

Where coal fires are not desirable, gas stoves of architectural character to resemble a coal fire, or one made of imitation logs, and burning in a dog grate can be reasonably associated with a brick fireplace of the less heavy type. An anthracite stove may also be suitably framed by the simple treatment for a hall fireplace shown in p. 410, though such a design would be equally pleasing for a small sitting room or country bedroom, with either a gas or coal fire.

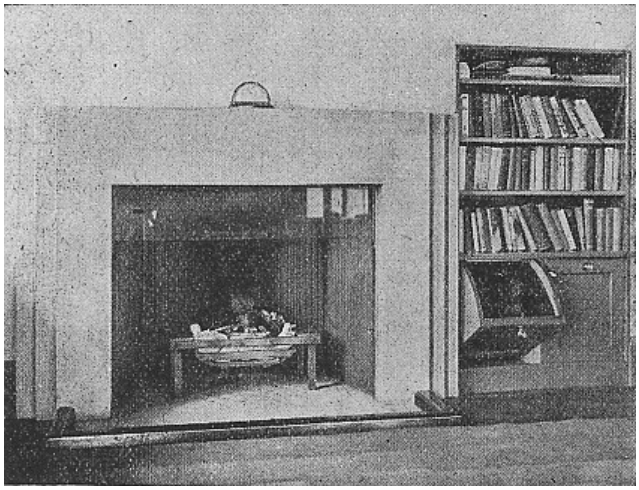
Attractive Examples. Many larger modern living-room fireplaces are based on designs taken from genuinely old examples such as that seen in Fig. 1. This beautiful fireplace with its massive oak shelf, beam, square tiled hearth and stone curb is many centuries old. Interesting details are the fireback, dog grate and fire-dogs or andirons which support the antique fire irons. Firebacks look their best in such a setting. Modern adaptations of these are copied in cast iron or can be made from sheet metal with applied ornament. The design can be carved in wood or modelled in plaster on a canvas backing, and the finished casting obtained from an iron founder. Various sizes of cast iron firebacks were commonly in use in the fireplaces of the 17th, 18th and 19th centuries, and were made in Sussex during the 15th century. The earliest designs were very simple, but those of the 17th century reproduced to-day are decorated with flowers, fruit, figures and various heraldic emblems.



Fireplace. Fig. 1. Antique brick fireplace in a Sussex residence. The built-in massive oak beam and the fireback are noteworthy (Humphrey, Joel)

Brick and tilework fireplaces in bold simple designs are an excellent choice for oak panelled or half panelled rooms, and are quite suitable in the country type of drawing room, where the keynote is comfort and the furnishing of a somewhat solid character. Brick looks particularly well with carpets and rugs in mellow oriental colourings and with curtains and covers of linen printed in a Jacobean design or in conjunction with chintz hangings. Such a fireplace may provide cosy nooks on either side for winter evenings, and immediately produces a feeling of welcome and homeliness with a wide hearth and curb in one with the chimney piece and with brass accessories to enhance the glowing warmth.

In modern adaptations of Tudor style the stone arch, open hearth with its herring-bone brickwork and simple treatment of the mantelpiece are seen. Nothing is more easy to keep clean than the hearth of this period, either during the day when the fire is burning, or when relaying. The firebrick interior with canted, forward back is very efficient; burning little coal and throwing out a good heat, but by its size admitting of a big fire on a cold day, while rough logs can be burnt instead of the specially cut ones necessary for some types of grates. The beauty of copper or brass wall and hearth fitments add to the attraction of such a fireplace. Fig. 3 shows an adaptation of Tudor style in



Fireplace. Fig. 2. Design suitable for a small flat. The pull-out coal box fitment below the bookshelves should be noted. (Humphrey & Vera Joel)

Bath stone and old English bricks. Tiles surround the outer part of the hearth finished by a solid oak curb. Even in these days of electric fires most people really prefer a genuine coal fire, especially the down fire in the modern rendering of a Tudor room either wood panelled or oak-beamed.

While a Tudor stone or a brick fireplace seems ideal for the dining room or lounge hall, the Georgian style shown in Fig. 4 is perfect for the 18th century period type of drawing room with painted panelled walls. The curved steel fender, steel basket grate and fire irons, pale green tiles, white marble surround and ornamented shelf are beautiful features of the whole.



Fireplace. Fig 3 Adaptation of Tudor style in Bath stone and old English bricks. (E. F. Collins)

Modern fireplaces of small type abandon such architectural treatments and adopt rectangular designs and receding planes usually without ornamental moulding. Such a design is shown in Fig. 2, with a dove-grey marble surround and black marble curb. This fireplace is particularly suitable for a small flat. The coalbox is in the lower part of a built-in bookcase, the companion cupboard containing wood. In this example the mantelshelf is very narrow; often in such a fireplace it is absent.

In many modern fireplaces slow combustion grates are found, or they are merely settings for gas and electric fires. A gas fire needs a flue only a quarter of the area necessary to that for a coal fire, and it is possible to use flue blocks built into the partition wall. Space can thus be saved by doing away with the chimney breast and setting the gas fire direct against the wall. Electric fires, which need no flue, can be placed anywhere in the room, but as a rule they are decoratively best in a modern fireplace setting, though when of the kind which simulates an ordinary fire, they are seen in various period settings.

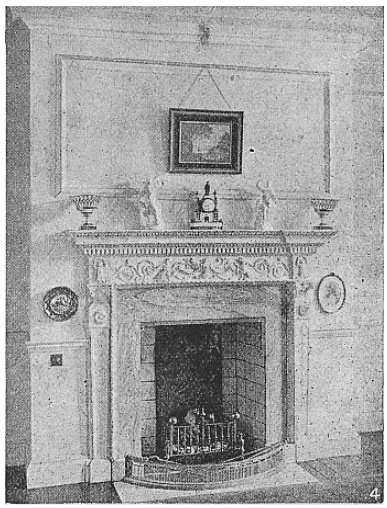


Fig. 4. Drawing room fireplace, in Georgian style in panelled setting. (Courtesy of Country Life, Ltd.)

In other fireplaces which are both decoratively and practically designed to suit all sizes of rooms, the coal burns in a bowl-shaped interior of special fireclay which is manufactured to radiate intense heat, and with the help of a clay fireback set at a forward angle the heat collected from the burning coal is sent out into the room. The brick fireplace seen in Fig. 5 possesses a barless slow combustion grate. Various other forms of fire or fireplace interior will be described in the article on Grate.

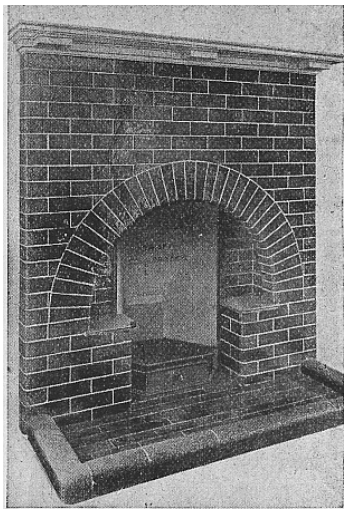


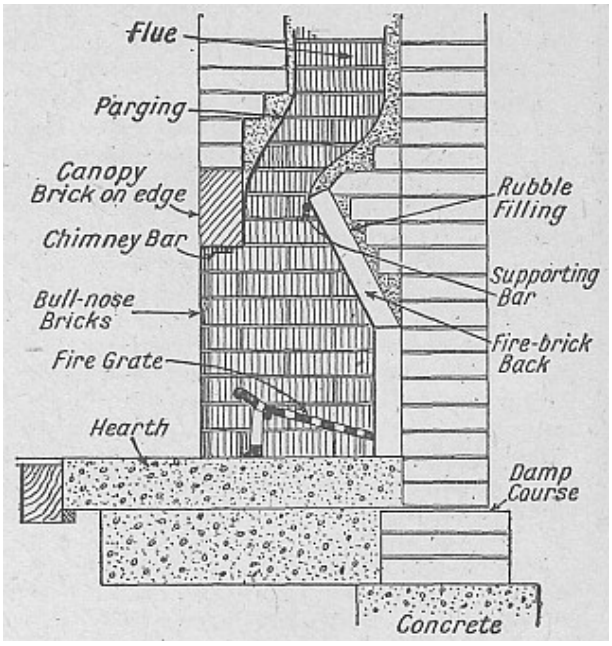
Fig. 5. Hob fireplace constructed of brick. The interior is not attached to the canting firebrick, and can be replaced in summer by some decorative scheme. (Courtesy of Bratt, Colbran & Co., Ltd.)

Structural Details. In designing a house, it is important to locate the fireplaces as far as possible on the internal walls. Every fireplace in an outside wall involves a separate chimney and stack to itself, and the multiplication of stacks is an extravagance.

Fireplaces are formed by building projections, generally of brick, either into the room or outward into an external chimney stack. These projections are known as jambs. The usual size of a fireplace opening is about 3 ft. sq. when intended to be fitted with the usual register-stove or grate. A charming effect can be obtained by removing the mantel register-stove

and building a fireplace with bricks. These can be set in front of the walls of the jambs, and the work can be carried out by the amateur bricklayer, all that is necessary being some bullnose bricks with which to form the face of the jambs, and some nicely coloured stock or facing bricks. These must be set in cement-mortar. The diagram at Fig. 6 illustrates the chief points of such a fireplace. The jambs should not be carried to the top of the opening, but only to a height of some 24 in., according to the height of the room and the size of the desired opening. A strong iron bar about 2 in. wide and ¼ in. thick is then set on the top of the brickwork and 1 in. from the front.

On this the facing bricks are set in an upright position, and well flushed with mortar. The back of the fireplace may need facing with the same coloured bricks, or firebricks may be obtained and set at the back, and the upper bricks carried over towards the front in order to act as a throating to the fire, in the manner shown in the diagram below. The fireplace opening should be small in relation to the size of the room, as a small opening and a large room accord well, while a large opening in a small room is never a success. The width of a fireplace depends so much on the room that any definite rules are impossible, but 12 in. will suit most rooms up to 12 ft. sq. The opening is governed, of course, by the size of the stove. A 16 in. or 18 in. stove will be suitable for a room about 16 ft. long by 12 ft. wide, but much will depend on the geographical position, number and size of'windows, and number of outside walls.



Fireplace. Fig. 6. Diagram showing section through a simple brick-built fireplace.

FIREPROOFING. There are various methods of treating an article or piece of material so as to render it partially or wholly non-inflammable. In the case of fabrics the treatment consists in immersing the articles in a liquid, or of spraying them, and is obviously limited to those materials which are not liable to damage by being so treated.

For example, fancy dresses made from muslin and other common materials may well be fireproofed, but a rich evening frock would sustain damage if immersed in chemicals. Various formulae have been published from time to time for the fireproofing of fabrics, and these vary very much as regards their efficacy. The following are applicable to materials of the classes mentioned:

a. A strong solution of tungstate of soda.
b. Ammonium borate, 1 part.
Potassium carbonate, 3 parts.
Water, 33 parts.

Wood is rendered fire-resistant by the use of any of the recognized fireproof paints, these being applied in much the same way as ordinary paint. Fireproofing compositions may also be brushed into the wood, or the articles may be entirely immersed, either plan being adopted according to the nature of the work. In addition to the use of fireproof paint, whitewash is a good protective for woodwork. It is made by dissolving lime in water with the addition of a little whiting, and is simply brushed over the work. Two or three coats will act as an efficient fire-retarding medium. The following are effective fireproofing compositions for wood:

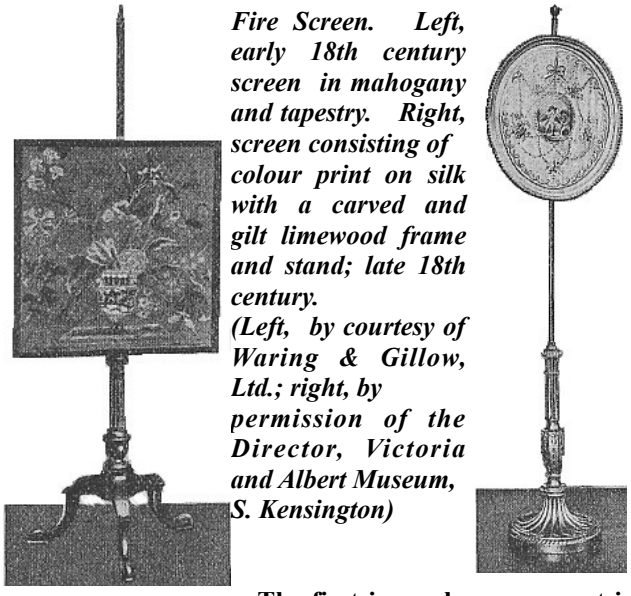
a. A strong solution of tungstate of soda.
b. Ammonium borate, 2 parts.
Potassium carbonate, 6 parts.
Water, 60 parts.

FIREPROOF WARE. Cooking utensils made of fireproof china, earthenware and glass have now largely replaced metal pans and pots, especially for braising, stewing and soup making. Casseroles can be bought in all sizes, from the large type capable of holding a family stew, to the smaller ones used in the preparation of ragoûts, salmis and hot pots. Ramequin cases in brown or green fireproof china are also sold for making small soufflés, creams, etc., also white china shells for holding scallops of meat, fish, game or vegetables.

Au gratin and other baking dishes are obtainable in the same wares, and are invaluable in houses where meals have to be kept waiting, for they can be left in a hot oven without fear of breakage. Green china entrée dishes, also fireproof, are equally useful, while even more attractive are the ones in glass. Brown earthenware casseroles and square baking dishes look well on an oak table. All fireproof ware can be kept clean by washing it in warm, soapy water, and burn marks may be removed with fine sand. Stains caused by fruit or vegetables are best treated with soap and water. The dish should be soaked in this solution and then washed in the usual way. *See* Casserole.

FIRE SCREEN. Of the two types of small screens known as fire screens one only, the shield on a stand, which can be fixed into position to protect the face from the fire, is true to its name. The other is really an

empty grate screen with a purely decorative value.



Fire Screen. Left, early 18th century screen in mahogany and tapestry. Right, screen consisting of colour print on silk with a carved and gilt limewood frame and stand; late 18th century.
(Left, by courtesy of Waring & Gillow, Ltd.; right, by permission of the Director, Victoria and Albert Museum, S. Kensington)

The first is rarely seen except in the genuine or reproduced styles of the eighteenth and the first half of the nineteenth century. The second type should be carefully chosen. A well-blacked grate is preferable to the cheaper and less artistic forms of bought screens.

The mahogany Chippendale style fire screen, with glazed brocade, or needlework panels, is always correct with furniture of the same character, and so is the Louis XV type of ornate gilt panels, and the Empire model with ormolu decoration. Screens in decorative leather work are suitable for a living-room, while furnishing jaspé and linen are quickly and effectively embroidered in coloured wools to make panels for wooden frames. A piece of Chinese embroidery, glazed and framed in narrow black, looks well if nicely fitted to the grate opening of a small fireplace.

A pretty screen for a sitting room grate is made by ferns or flowering plants arranged in a simple two-tier flower box to suit the size of the fireplace, but it is often impossible to exclude the down draught from the chimney without a sheet of glass fitted to the opening behind the flowers. Another idea of the same type is an arrangement of cut flowering shrubs or foliage in a pottery vase. Metal screens, chromium plated or in rustless steel or oxidized silver or copper, have the merit of not tarnishing. These usually match the curb or fender and fire irons, and are sold in a suite or separately. *See* Flowers; Leather Work.

FIREWOOD. Firewood can be bought ready for use in bundles, but is cheaper when bought as rough wood from a grocer and chopped up as required. In country districts local supplies can be obtained. If the wood is cut when green it will have to be dried and stored for some months.

If the oven has been used during the day, wood may be left in it all night, and will thus dry quickly and thoroughly. Logs of wood are useful to supplement coal and to burn with slack. Sometimes opportunities occur of buying discarded blocks of wood paving. These are an excellent form of fuel for the house on account of the tar with which they are soaked. *See* Coal; Fuel, etc.

FIRMER. A firmer chisel is an ordinary carpenter's chisel, having a blade of normal proportions, neither thin, as in paring chisels, nor of exaggerated thickness, as in mortise chisels; the blade has a tang and shoulder to take a wooden handle.

The firmer gouge is the ordinary form of gouge as used by carpenters and joiners; the blade is more or less curved, and may vary from practically flat to a semicircle in cross section. It is sharpened on the back by grinding on a grindstone, and whetting on an oil stone, in the usual way. Firmer gouges are employed for all classes of curved work and, in addition, for some forms of carving, such as hollowing and shaping a model boat hull. *See* Chisel; Gouge.

FIRST AID: How to Render. Everyone should know how to give some aid in cases of accident and sudden illness. A few simple measures promptly carried out will often prevent serious developments, and may save life.

It is a common incident to see would-be helpers lifting a fainting person into a sitting posture. The fainting is due to insufficiency of blood in the brain, and this manoeuvre still further reduces the supply, thus prolonging the fainting fit. Indeed, when the heart is very weak or the patient has lost a great deal of blood death may be caused by lifting him.

In cases of unconsciousness the first essential is to loosen all the patient's tight clothing and provide for a free current of air. To assist this other people should not be allowed to crowd around him. When the face is pale, the patient should be laid flat on the ground and the legs slightly raised; when flushed, the head should be raised. In both cases the head should be turned to one side. Nothing of any description should be given by the mouth until consciousness is restored.

On no account should those rendering first aid make any attempt to force brandy or other stimulant down the throat of an unconscious person, as this may result in choking him.

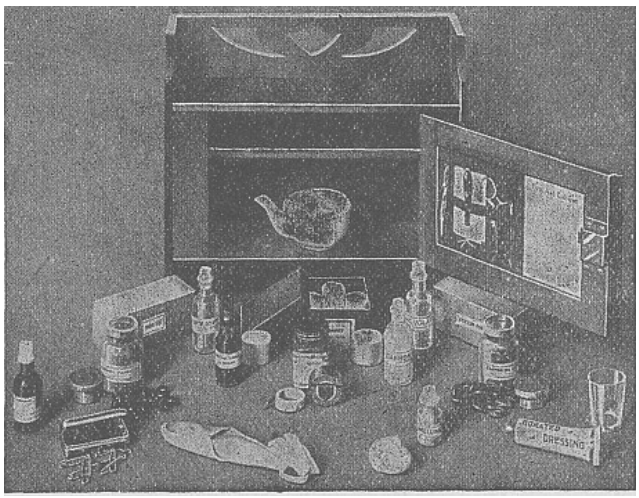
It should be the rule not to move a person who has been hurt or becomes suddenly ill, except so much as is necessary to permit of his breathing easily, until some opinion has been formed as to what is the matter with him. Urgent conditions like bleeding and shock should be attended to first, the former by taking the necessary steps to arrest haemorrhage, and the latter by applying warmth. In cases of severe burns, especially in children, a shock-like condition may be present. By putting a child in a warm bath not only is the shock treated, but the removal of clothing is made easier.

Before beginning artificial respiration, in all cases where it is necessary, the mouth and the back of the throat should be examined to make sure that they are clear. Clothing should not be removed unnecessarily in the case of accidents out of doors. In the case of bleeding, the wound may be exposed by slitting a seam

with a knife, but while this is being done pressure should be put on the main artery. If a person's clothes are on fire, some heavy fabric, a rug, a blanket, or coat, should be thrown round, and he should be rolled on the floor in this.

In sending for the doctor, it may save valuable time if he is told, preferably in writing, the general nature of the emergency, e.g. bleeding, broken bone, poisoning, etc., and details, as to the part injured, the poison suspected, and so on.

First Aid Cabinets. First-aid cabinets for service in the home in plain deal, fumed oak, and white enamel are sold in various sizes. They contain all the dressings and bandages necessary in case of accident, while some of them, finished with nickel-plated fittings and plate-glass shelves, may serve also as bathroom cabinets. The doors of these cabinets, when closed, provide good shaving mirrors. Smaller first-aid outfits are sold in cases containing ointment, adhesive plaster, bandages, lint, etc. These can be easily carried in the pocket. *See* Artificial Respiration; Asphyxia; Bandage; Bleeding; Burn; Epilepsy; Fracture; Poisoning; etc.



First Aid Cabinet in fumed oak, which can be hung on a wall or set upon a shelf. The contents comprise everything which may be needed for the relief of common ailments and accidents. (Courtesy of Boots Pure Drug Co., Ltd.)

FISH: CHOICE, COOKING, FOOD VALUE, ETC.
Some Facts of Daily Interest to Every Housewife

This article describes the several ways of cooking fish, gives information about various fish dishes, and contains other facts of value in the home. See the entries on fish ordinarily eaten, e.g. Cod; Haddock; Halibut; Salmon; also Diet; Food.

Next to meat we must rank fish as one of the most valuable sources of the proteid, or body-building material, and fat. This food may be used, with benefit to health, by persons who do not require a full meat diet for the repair of bodily waste. Even those workers whose occupation requires a liberal diet can thrive upon a little meat and a moderate allowance of fish. For townspeople of sedentary employment or for those engaged in light manual work, fish constitutes one of the best proteid foods.

Cod, haddock, smelts, and flounders are among the lean fish, and very little fat can be derived from them. But cod has a high percentage of proteid, and is therefore nutritive.

For energy, as well as the restoration of tissue, we need a varied fish dietary, and fat fish should be chosen by persons whose labour demands muscular exertion. One of the virtues of a fish diet is its full absorption in the body. Only about five per cent of the solid matter of fish is lost in digestion. All the lean fish are readily digested, and are therefore recommended to invalids; and any fairly normal digestive system can absorb salmon or the more oily kinds.

Cost and Food Value. It must not be supposed that the cost of some kinds of fish has any relation to their nutritive value. A dozen oysters yield only a small amount of fat, and about as much nourishment as a single herring. A sole may please the palate more than a plaice, but it contains considerably less fat; halibut is almost as nourishing as turbot. Mackerel have much less fat than eels, but more proteid. Tunny, sold in tins, has over 30 per cent. of fat.

One great advantage in a fish diet is its digestibility as compared with meat. Cod is perhaps the least digestible fish and mackerel the most digestible. Lean fish, such as whiting, can be digested readily by many invalids. When a food is cheap it is often refused on the ground that cheapness and a lack of nourishment go together. This is not the case with any of the fat fish—herrings, bloaters, sardines, sprats, and eels.

Some kinds of fresh fish may contain as much as 70 per cent. of water. Oysters have over 77 per cent. of water and about 22 of nutriment. In a salt herring there is 53 per cent. of nutrients. The difference between the amount of fat in fish is shown by comparing a hake with a mackerel. In the former the fat is only about 5 per cent, and in the latter 25 per cent. But the lean fish are by no means devoid of nourishing matter. Cod contains 91 per cent. of body-building material but very little fat. Turbot yields rather over 84 per cent. of proteid, and halibut contains 79 per cent.

Varieties of Fish. There are unreasonable prejudices against eating several kinds of valuable fish. One of the blennies, known as the cat-fish or wolf-fish, is often despised as a table fish, but it is very good eating. Some of the British sharks and dogfish are quite edible. They are rejected because of their unattractive appearance. One of the tastiest fishes that swim is the gurnet or gurnard.

The handsome lythe or pollack is not a good fish for keeping, and must be eaten soon after it is caught. The edible quality of this fish is not sufficiently known, and the same may be said for the coal-fish or saithe and sea bream.

The choice of fish may be largely determined by its

appearance. Fresh fish is stiff, plump and firm, has bright, firmly attached scales, clear eyes, and red-coloured gills. When the freshness wears off the fish becomes flabby, the flesh is easily indented with the finger, the eyes are dull and glazed, while the scales fall off easily. Growths about the head or fins, unsightly blotches and scaleless patches are well-known signs of disease.

In stale fish the gills change to a dark red or a whitish colour; but this test is not infallible, for trawl-caught fish are suffocated often in the process of hauling in the nets, and the gills become congested and dull-looking. Oysters should be firmly closed, but if slightly open, the shells should meet instantly and tightly on the blade of a knife being inserted between them. If the shells gape, the fish are unwholesome.

Tinned Fish. Tinned fish should be turned out of the tin as soon as the latter is opened, and consumed as quickly as possible. Lobster, in particular, keeps badly. Tins which show signs of rust, of being soldered in many places, or which give a hollow drum-like sound when tapped or shaken, should be rejected. Sardines, small herrings and tunny which are preserved in oil should be taken out of their tins and kept in a covered china or glass dish. When air reaches the open tin, chemical action is set up, and the oil becomes impregnated with the metal. A wholesome smell characterizes cured fish which is in good condition. In case of doubt, make a small incision with a knife near the backbone and test the odour.

Fish should be kept in a cool, dark place, and whenever possible in prepared paper bags placed in ice. If the bags are fastened down the fish should keep fresh.

Cooking Directions. Fish are usually fried or boiled, but there are other methods, such as steaming and grilling and baking. Boiled fish lose some of their nutritive value in water, but steamed fish retain the nutrients, and are more agreeable to the palate. Most fish that can be boiled can be steamed.

The general rule in boiling all kinds of fish is the avoidance of haste. The water should be heated until it is near the boiling point, and the fish, wrapped in muslin, placed in it and boiled quickly for 2 or 3 min. only. The heat must then be reduced, and the fish allowed to simmer; 3 lb. of fish will require 20 min. for boiling, and 35 for steaming; 1 lb. of fish will require about 12 min. boiling. Casserole cooking is a good method with large fish, which should be placed in the casserole in fillets with a little butter. An onion, pepper, and any kind of spice that is approved, such as cloves, should be added. After stewing for 5 min., a glass of white wine will give an additional flavour, or a teaspoonful of Worcester sauce, and some slices of lemon. Take the fish up on to a hot dish and allow it to drain well still wrapped in muslin. Remove muslin and pour away the liquid that has collected before serving.

Two or three of the coarse freshwater fish are scarcely worth cooking. Barbel is an example, though in Spain this fish is cooked with onions and spices, and eaten by the peasantry. Chub are insipid and very bony. Bream from fresh water are edible, but cannot be considered luxuries, and the same may be said for roach. Carp and tench have slightly more flavour, and may be stewed or fried in olive oil, butter, or beef dripping. Pike may be cut into collops and fried, or stuffed and baked. Perch should be skinned to remove the rough scales. Gudgeon are rather more flavoured than many river fish, and may be fried like perch. Trout of over 1 lb. should be filleted and fried or grilled. Large lake trout and sea trout are best boiled. Kedgerees, curries, and rissoles can be made with almost any kind of fish as the main ingredient.

The flat fish—skate, soles, plaice, and dabs —are best cooked by frying, either whole or in fillets. Cod, large haddock, and pollack should be cut into steaks before frying. Fish are often stuffed with forcemeat and baked.

In the preparation of fish it is essential that each cloth or cookery utensil should be thoroughly cleansed after use, or the next article of food which comes in contact with it will contract a fishy flavour. A saucepan or kettle in which fish has been boiled, or one used in making fish soup must be washed separately from other pans. After touching fish it is sufficient to wash the hands in the ordinary way to remove all odour.

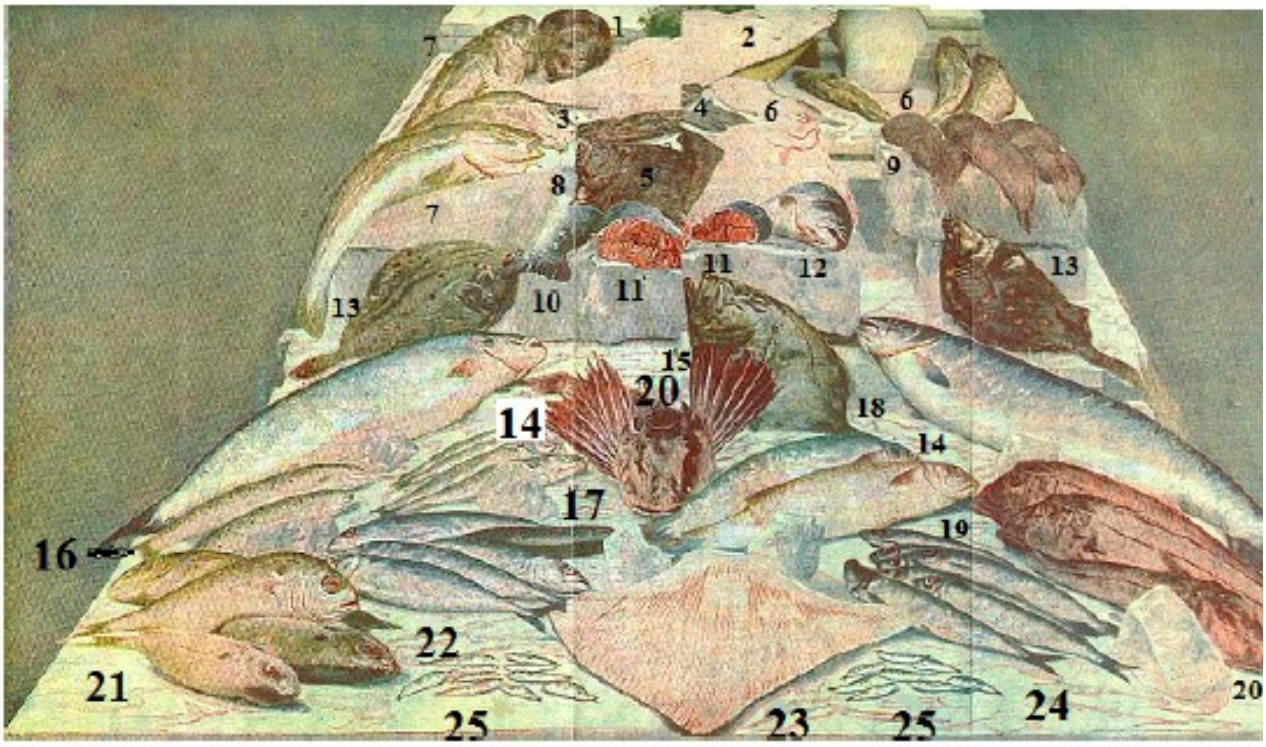
Curing Fish. Fish cured in the following way will keep for a long time. Clean and carefully wash and scale the fish, and, if large, split it down the back. Rub it thoroughly inside and out with finely powdered common salt, and hang it in a cool, draughty place for 24 hours. Next rub into it a mixture of 1 oz of bay-salt and ½ oz each of coarse brown sugar and saltpetre.

Lay the fish on a dish, cover it with more salt, and leave it for at least 48 hours. Then turn it, cover it again with fresh salt, and leave it for a further period of 24 hours. Drain of the brine alter this time, dry the fish, fix it on thin sticks, and hang it in a cool, dry, airy place. If kept for long soak the fish in cold water for 24 hours before cooking it.

Filleting Fish. Large fish are seldom filleted unless a portion is purchased that can with advantage be boned and cut into strips or pieces. Flat fish, such as soles and plaice, make the best fillets, although haddock and whiting are frequently used for this purpose. To fillet flat fish, lay it down upon a board and with a sharp-pointed cook's knife cut off the head and fins; also cut the tail across. Score a line down the spine and, pressing the knife against the bones and taking long, even cuts, take off one side of the fish. Then turn it round and remove the other side. Turn it over, and repeat the process.

Haddock and whiting are treated in the same manner, but in these cases there are only two fillets, instead of four, to be removed. It is economical to fillet fish, for the bones can be used to make fish stock for the sauce.

FISH: NATURAL COLOUR PHOTOGRAPH OF A FISHMONGER'S DISPLAY SLAB SHOWING TWENTY-FIVE VARIETIES OF FISH REGULARLY AVAILABLE FOR THE HOUSEWIFE'S SELECTION



1. Brill, top and under sides
2. Halibut
3. Fresh haddock, large (Jumbo)
4. Witch sole
5. Slip soles
6. Fresh haddock, small
7. Cod
8. Turbot
9. Dover soles
10. Salmon, tail cut
11. „ middle cuts
12. „ head and shoulder cut
13. Plaice
14. Whole salmon
15. John Dory
16. Salmon trout
17. Whiting
18. Grey mullet
19. Red mullet
20. Red gurnet
21. Sea bream
22. Mackerel
23. Skate, wing
24. Fresh herrings
25. Whitebait

(Arranged by Mac Fisheries Ltd.)

Frying Fish. Frying is the quickest way of cooking most fish. Small fish are usually fried in the frying basket; and fillets and steaks of fish are fried either in deep fat or in just sufficient fat to cover. In all cases the fat must be very hot when the fish is immersed; so hot that it has ceased to bubble and a blue smoke is rising from the pan. All fish before being fried must be well dried, and this is best accomplished by rolling it in flour seasoned with salt and pepper.

Fillets and steaks of fish are usually dipped into beaten egg and coated with breadcrumbs before being fried, or dipped into batter. When the outside is of a pale brown colour the fish is cooked. The fish is lifted out of the pan with a fish slice to prevent the flesh from breaking. Fried fish must be well drained before being served. This is done by placing it on a sheet of kitchen paper or on a cloth. It is served up on a dish paper, and the usual garnish for fried fish consists of pieces of cut lemon and sprigs of fried parsley.

The fat most commonly used in Great Britain for frying fish is lard or dripping, although some prefer the continental custom of frying in olive oil. Frying oil can be bought at provision shops, and is not so expensive as pure olive oil but equally efficacious.

Fish Stock. This stock forms a good basis for fish soups or sauces. Make it by putting 1 lb. of bones, heads, and trimmings of any fresh fish into a saucepan containing 1 quart of cold water., a blade of mace, a small peeled onion, 4 cloves, 6 peppercorns, and a pinch of salt. Bring it to the boil, let it simmer for 10 min., then strain it. If the stock is allowed to boil too long it will become bitter. Fish stock must not be kept from day to day as it soon turns sour.

Using Cold Fish. There are many ways in which the remains of cold cooked fish can be made into appetising breakfast, luncheon, and supper dishes. Any cold, left-over sauce should be used for mixing these dishes, and they should always be well seasoned. The following five recipes will be found useful.

Fish Cake. Any cooked white fish and some cold cooked potatoes, in the proportion of 1 lb. of fish to ½ lb. of potatoes, are needed to make these cakes. Skin, bone and flake the fish, rub the potatoes through a sieve, and in the meantime melt 1 oz. of butter in a pan over the fire and add to it a tablespoonful of milk. When these are hot, put in the fish and potato, the beaten yolk of an egg and seasoning to taste, and stir the whole over a low heat for a few minutes. Spread the mixture evenly on a plate, mark it with a knife into a dozen even-sized divisions, and form each into a neat, round cake about ¾ in. thick. Brush these over with beaten egg, coat them with breadcrumbs, and fry till brown in a pan of smoking hot fat. The mixture may also be formed into balls and fried.

Fish Galantine. Take the skin and bone from 1 lb. of any cooked white fish, break it into flakes, and mix them with two teaspoonfuls of chopped parsley, the beaten yolk of an egg, seasoning to taste, and enough egg, anchovy, or shrimp sauce to bind the whole. Make the mixture into a roll, place this on a greased baking-sheet, brush it over with the white of egg, then sprinkle it with breadcrumbs or maize meal, and bake it in a fairly hot oven till brown. This galantine can be served hot with the same kind of sauce as is used for mixing, or cold with salad.

Fish Moley. Chutney and grated coconut should be served with this Indian dish. To prepare it, cover ¼ lb. of desiccated coconut with boiling water, and leave it to soak. In the meantime, fry 2 oz. of sliced onion in the same quantity of dripping. Add ½ teaspoonful of powdered tumeric or saffron, the strained coconut water, a small piece of green ginger, 1 teaspoonful of sliced chillies, 1 lb. of cooked fish, cut up into small pieces, a tablespoonful of vinegar, and a little salt. Simmer the whole till it thickens, and then heap it on to the centre of a dish, arranging round it a border of boiled rice.

Fish Mould. These moulds can be made from the remains of any cold fish. Remove all skin and bone from about 3 heaped tablespoonfuls of fish, put the flesh in a mortar, add 1 tablespoonful of fresh crumbs, 1 teaspoonful of chopped parsley, 1 oz. of warmed butter, a beaten egg, 4 tablespoonfuls of milk, and seasoning, and pound all well.

Well butter some small dariole moulds, fill them with the mixture, cover them with pieces of greased paper, and steam them gently for ½ hour in a pan containing enough boiling water to reach half-way up the moulds. Turn the moulds on to a hot dish, pouring round them ¼ pint of parsley sauce.

Fish Pie. Any kind of cooked fish can be used for making this pie. Prepare it by rubbing 2 heaped breakfastcupfuls of mashed potatoes through a sieve, and adding to them 1 oz. of melted butter, a tablespoonful of milk, and salt and pepper to taste. Then mix all well together. Remove the skin and bone from one heaped breakfastcupful of cooked fish, chop it up coarsely, and place it in a pie-dish.

Melt 1 oz. of butter in a saucepan, stir in the same quantity of flour, and then add 1 pint of fish stock. Stir this sauce over the fire until it boils and thickens, add 1 hard-boiled egg chopped in large pieces and seasoning to taste. Add sufficient of this sauce to the fish to moisten it well, and cover the dish with the potato mixture, smoothing it evenly over the top, and marking it with a fork. Scatter small lumps of butter over the whole, and bake the pie in a moderately hot oven until it is brown. Salt cod may be used after soaking and preparing.

Uses of Fish Bones. Fish bones provide valuable manure for the garden if placed in the ground immediately before or at the time of seed sowing. They

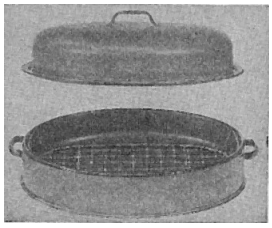
are usually mixed with other manure before use, and succeed best in dry soil. Bones left over from meals may be used in this way, but uncooked bones are better.

Bones in the Throat. In most cases where a fish-bone is caught in the gullet, it is either spat out or swallowed later on with a bolus of food. A scratch may then remain and give the mistaken idea that the bone is still there. When the bone effects a lodgment it is a good plan to swallow large mouthfuls of bread not much masticated. Small bones may sometimes be gradually dissolved by taking occasional sips of lemon juice or lemon juice and water. If the bone is not removed by these measures a doctor should be consulted, or the results may be serious.

Poisoning by Fish. Several varieties of fish are poisonous by reason of substances that are manufactured by certain of their glands, e.g. liver, ovary, etc. Some are always poisonous, some at certain periods, and some only to persons who are peculiarly susceptible.

In Great Britain mussels, mackerel, and sometimes oysters, as well as tinned salmon, crab, lobster, eels, etc., occasionally produce severe symptoms of poisoning. This is usually due to their having been invaded by microbes, e.g. that of botulism. Oysters, have been responsible for carrying enteric fever and allied disorders. Mussels, especially those taken from docks, harbours, and the mouths of rivers, where the water is contaminated with sewage, are frequently poisonous.

FISHER FUR. Long-haired and dark brown in colour, fisher fur, or fisher marten, as it is also called, is obtained from the largest of the marten tribe, an animal measuring 2 to 3 ft, in length. Fisher fur, like all other dark-coloured pelts, may be cleaned with silver sand. Put the sand into a dish in the oven, and when it is thoroughly warmed rub it into the fur. It may then be shaken or, if necessary, brushed out. *See* Fur.



Fish Kettle of blue enamel fitted with wire strainer.It can also be used for frying, roasting, etc. (Courtesy of Staines Kitchen Equipment Co., Ltd.)

FISH KETTLE. This is a utensil for cooking fish. It is generally oval and fitted with a strainer or drainer, and is made of block tin or aluminium, while some of the better kind are lined with copper. The drainer is essential for several reasons. It enables the fish to be lowered gently into the kettle, and to be taken out again without breaking, and may also be used to keep fish warm when it is not to be served immediately. The drainer is placed across the kettle, and the fish, which should be covered with a clean cloth, is put upon it and is thus kept warm by the steam. Fish kettles may be cleaned in the same way as other aluminium or tin pans. *See* Aluminium; Tin.

FISH KNIFE. The blades ot these knives are of silver or electro-plate, not of steel, and are therefore blunter than the ordinary table knives. Fish knives and forks are made either in two pieces, the handles being of ivory, mother of pearl, or silver, or they are made in one piece entirely of metal.

Plated fish knives and forks or fish servers should be washed immediately after use, with hot soap suds, to which a small lump of whitening should be added. If there has been any delay, after washing, rub the surface of the knives and forks lightly and quickly with cut lemon, then rinse in the suds again and wipe the articles dry.

FISH SLICE or Server. This article of table use, now represented by fish carvers, was introduced into England in the 18th century and is valued by collectors. It has two main shapes, one in the form of a trowel, i.e. having a triangular blade, and the other with a curved edge on the working side. They were made in silver and Sheffield plate.

A somewhat similar slice, suited to kitchen use, is made of tinplate or sheet aluminium, and the handle formed in one with the blade. This is used for lifting and turning fish when frying it. It has holes for draining the fat.

FISH STRAINER. This is a perforated metal plate with handles, upon which fish is placed when it is boiled in a fish kettle. The handles are perpendicular to the plate and reach to the top of the pan, so that the fish can be lifted out of the water and drained without fear of its breaking. *See* Fish Kettle.

Fit. *See* Apoplexy; Convulsions; Epilepsy; Fainting; Hysteria.

FITCH. Fitch fur, obtained from a small animal of the marten species known both as fitch and pole-cat, has long black top hair and yellow underwool. It is used as a trimming and is often dyed satisfactorily to imitate sable.

The word fitch is somewhat loosely used in connexion with artists' brushes made of ox hair and used for painting in oils.

FIXATIVE. Any material used to make something permanent or fixed is a fixative, as, for example, that used in the form of a spray to fix the crayon or pencil lines on a drawing. This is perhaps the most usual application in a domestic sense, and such a fixative may be composed of dry white shellac dissolved in pure alcohol, sufficient of the shellac being used to form a thin film when it is sprayed on to the paper that is used for the drawing.

The fixative can be obtained at any artists' colour shop and is put up in a convenient form in a small

bottle. The sprayer is an L-shaped tubular device sometimes known as an atomizer. One end is inserted into the bottle of fixative and the other end used as a mouthpiece, and as the wind is blown into it, the fixative is drawn out and deposited on the paper in the form of a fine spray.

FIXING: Photographic. The photographic negative or print is fixed when those portions of the sensitive chemicals in the film which have not been acted upon by light and the developer are dissolved out. This is usually effected by a solution of hyposulphite, or thiosulphate, of sodium, commonly called hypo, in water.

For fixing negatives and films a solution should be made of 4 oz. or 6 oz. of hypo in 1 pint or 20 oz. of water. It should not be weaker than 4 oz. to the pint for negatives, but may be stronger. In making up the solution warm or hot water should be used; hypo in dissolving reduces the temperature of the water considerably, and if cold water is used it will take an inconveniently long time to dissolve. The solution should be cold before it is used.

It is not possible to say at what precise point the fixation of a negative is complete. It is certain that the process is not complete when the creamy emulsion has been dissolved away; negatives must be left in the fixing solution for double the time that it takes to remove this creamy appearance from the back of the negative. Stains, dark patches and other markings which cannot be removed from negatives are the result of incomplete fixing.

When the fixing solution has been used two or three times it is likely to become discoloured and stain negatives. It is therefore desirable to use only fairly fresh solutions. A pint of the solution given above will fix efficiently about a dozen ¼ -plate negatives. An acid fixing solution is particularly desirable for bromide prints. It is made up in the following proportions:

Hypo	4-6 oz.
Potassium metabisulphite	½ oz.
Water	20 oz.

The potassium salt should not be added to the hypo solution while it is hot, or sulphurous acid may be given off and the solution thereby weakened. This bath gives clear and brilliant negatives; it can be used for all fixing purposes, except for P.O.P. or daylight printing papers.

It is essential after fixing negatives and prints to remove every trace of the hypo, or the print will gradually fade. Washing may be done in running water or by frequent changes of water. More than 90 per cent. of hypo is washed away in the first 10 min., but considerably longer is required to remove the remainder, and for this purpose it is essential that the negative or print should be in perfectly fresh water. It is useless to expect to wash a negative effectively by placing it at the bottom of a basin under the tap with water overflowing at the top; what happens is that while the larger portion of the hypo is dissolved and washed away, the negative lies in a weak solution at the bottom of the basin.

Various forms of washing apparatus for both negatives and prints can be obtained. In freely-running water negatives and bromide prints should be washed for at least 30 min.; prints on thick paper or card and P.O.P. prints should be washed for an hour. *See* Bromide Paper; Developing; Gaslight Paper.

FIXTURES: The Law About. Legally fixtures and fittings are those articles affixed or joined to property in such a manner that while so attached they become part of it, e.g. gas or electric light fittings, tapestry on the walls, etc. They may belong either to the landlord or the tenant. In the ordinary case a tenant is not allowed to remove fixtures even though he has himself put them up. Where, however, they are fixed for ornament, or for the convenience or pleasure of the tenant, or for the purposes of his trade or business he may remove them so long as he does not injure the landlord's property in doing so.

After a tenant is in occupation he may put up over a doorway a wood or plaster ornament, panel, or frieze. These may be removed by the tenant if by so doing it will not damage the landlord's property. Otherwise they remain in the house and become the landlord's, although the tenant paid for their erection. Blind rollers, towel rails, fireplace accessories which were in a house when the tenant entered into possession remain the landlord's property. Blind rollers are often removed by an outgoing tenant under the mistaken idea they are his perquisites. To take away fixtures unlawfully is larceny at law. Trees, shrubs, etc., which were in the garden when the tenant entered into possession remain the landlord's fixtures.

In another sense a tenant can remove certain fixtures from their places, but must not take them from the house when giving up possession., Hangings, blinds, grates, stoves, may be taken down or removed to make room for similar articles of the tenant's own; but here again no damage must be caused to the landlord's property, and on leaving, all such fittings must be replaced, or the substituted ones left.

It should be particularly noted that a cupboard built into a house is the landlord's fixture, as distinct from a movable one provided by the tenant.

A tenant should remove any fixtures he is entitled to take at the time of quitting the premises, as he cannot re-enter the house for the purpose of removing them.

Trade fixtures are removable by the tenant, unless there is any stipulation to the contrary in the lease or agreement. In agricultural tenancies, such as farms, small holdings, allotments, the tenant is entitled to compensation for any improvements. For example, if he walls off part of his garden and plants fruit-trees, so that in the course of a few years there is a valuable orchard, he will demand and receive compensation, as he cannot take the orchard with him on removing. On the other hand a town tenant must leave all fruit trees in his garden as fixtures of the landlord.

Much trouble is saved if the tenant asks for and

receives from the landlord a complete list of fixtures, as it often happens that these get lost or destroyed, and the landlord demands payment or damages in respect of them. For example, he finds a kitchen raker is missing, and accuses the tenant of removing it. Probably it was missing when the latter entered upon the tenancy, having been taken by a previous tenant. A list in duplicate agreed upon by landlord and tenant at the commencement of a tenancy would avoid much misunderstanding. *See* Blinds; Bracket; Cupboard; Curtains.

FLAG. This is the popular name given to some varieties of the family of iris. It is also known as the poor man's orchid. The word flag is generally intended to refer to the wild yellow iris, or to the purple iris, which blooms in such a prolific fashion in June in suburban gardens. It is not, strictly speaking, a bulbous plant, but has rhizomatous roots, which may be separated in the autumn if increase of stock is desirable. Its botanical name is Iris germanica. *See* Iris.

FLAGEOLET: In Cookery. The small green beans of French or kidney beans, known as flageolets, are cooked in several ways. In Great Britain they are generally sold in a dried state, though they are also excellent when fresh and cooked in the same manner as green peas. Dried flageolets need to be washed and soaked overnight before being put into a saucepan containing just enough cold water to cover them. A small quantity of mixed herbs and an onion should be added to give flavouring, and the whole brought to the boil.

The beans require about 2 hours' cooking before they are tender, when they should be drained and tossed over the fire in a pan containing a little butter. They are then ready to be seasoned and served. Flageolets may also be served in egg, or parsley, or any other suitable sauce, in which case they should be cooked until tender according to the directions already given, drained, and then reheated in the sauce.

FLAGON. This word is employed for a vessel used for holding liquid, one somewhat taller than the tankard and fitted with a lid. In England flagons are found in the 16th century or earlier. The lid was hinged at a point well back on the handle, and was provided with a thumb-piece, so that when drinking, the drinker could keep the lid quite clear of his mouth.



Flagon. Left, flagon of serpentine marble mounted in silver-gilt; about 1630. Right, flagon of silver-gilt, repoussé with tulip flowers, leaves and animals; 1663 (Courtesy of the Director, Victoria & Albert Museum, S. Kensington).

Flagons were made of silver, as well as of pewter and cheaper metals. One example, illustrated in the next page, dating from 1663, is of silver gilt. It is cylindrical in shape, with a flat cover and a scroll handle. The thumb-piece represents a pierced heart, and is beautifully chased and embossed. It stands 15 ½ in. high. Today the word is used for the glass bottle in which certain kinds of wine are sold. *See* Silver; Tankard.

FLAGS: The Game. Also known as French and English, this is an excellent game for large parties of children, such as picnics, school treats, and the like. It is played out of doors or in a large schoolroom, as a good deal of space is required. The players are divided into two sides, which are chosen in the ordinary way.

A line is marked across the middle of the ground; one side occupies one half of the ground and the other side the other half. At each end of the ground are laid handkerchiefs—stones, caps, or any other portable objects do equally well—which represent the flags of the side, and are to be defended against the enemy. The sides then take up their position in their own camp, and the game begins.

It is the object of each side to capture the flags of the other, but the moment a player steps across the dividing line he can be caught by any member of the opposing side. If caught he is a prisoner, and must stand behind the flags with outstretched hand awaiting rescue. If he succeeds in reaching a flag without being caught, he can carry it back in safety. No flag may be taken while there are prisoners to be rescued. The game continues until one side has captured all the flags of the opposing side.

FLAME FLOWER. This is the popular name of Tropaeolum speciosum, one of the most beautiful of hardy climbing plants. It has pretty light green leaves and in late summer bears a profusion of scarlet flowers. It flourishes best in the cool, moist, northern counties and is often difficult to establish in southern districts. The roots should be planted in March or April in well dug soil to which leaf-mould has been added freely, and the position must be a shady one. It is often planted on the north side of an evergreen tree or hedge.

FLAN. This is a fruit pie or tart made by lining a flan ring or mould with flan pastry, and filling this, after baking, with tinned or stewed fruit and covering the fruit with a thickened syrup. Flans are usually eaten cold.

Flan Pastry. To make this, take 6 oz. flour, 3 oz. butter, ½ oz. castor sugar, ½ teaspoonful baking powder, 1 yolk of egg, and a little cold water. Sieve the flour, add baking powder, sugar and a good pinch of salt, rub in the butter, add the yolk of egg and a little water to bind stiffly. Rollout the pastry about ¼ inch thick. Well grease the flan ring, lay a greased piece of paper, a 1itt1e larger than the ring, on a baking sheet, and place the ring on it. Line within the ring with the

pastry, pressing it on well, particularly at the bottom, where the ring touches the baking sheet, so that there is a firm, sharp line between the bottom and sides of the flan. Trim off the pastry that stands above the ring, with a knife. Prick the bottom with a fork to allow air to escape. Cover the bottom of the pastry with crusts of bread so that it will keep straight while baking. Bake in a fairly hot oven 30 to 45 minutes or until a nice golden brown. Remove the crusts when done, and fill the flan case as required.

Almost any kind of tinned, bottled or stewed fruit can be used for flans. Apples should not be allowed to stew to a mash, but are better cut in very thin slices and arranged in the flan case in circles, the slices overlapping each other slightly. Other large fruits, such as peaches, pears and plums, may be cut in slices, but they are often used whole. Tinned pineapple slices give a prettier effect than the chunks, and cherries or other small fruits of a contrasting colour can be arranged in the holes in the centres of the slices. Slices of orange, cut crosswise through the sections, with the pith and pips removed, make a delicious flan. In this case use the juice from other tinned or stewed fruit to make the syrup. Small fruits, such as cherries, strawberries, raspberries, gooseberries, red or black currants, are always used whole.

To fill the flan case, drain the juice from the tinned or stewed fruit, and arrange the fruit in the flan case. Put the juice in a saucepan and bring to the boil. For each gill of the juice allow a teaspoonful of cornflour, blend this with a little water and add to the juice when boiling. Stir until boiling again and simmer for about eight minutes or until it thickens a little. Then add a teaspoonful of castor sugar to the gill, boil up again and let it simmer until thickened and reduced a little. Allow this syrup to cool, then pour it over the fruit in the flan case to just cover it, and leave it to get cold and set before serving. The top can be decorated just before sending to the table with little mounds of whipped cream.

FLANK: Of Bacon and Beef. The side of an animal from the ribs to the thigh is termed the flank. It is used mainly in connexion with beef or bacon. Thick flank of beef, though coarser in fibre than some other parts of the animal, is well flavoured and generally tender. It has no bone and little fat, is reasonable in price, and is therefore one of the most economical parts to buy for puddings, pies, etc. Thin flank is rather fat, but is low-priced and suitable for stews. It is excellent pickled and eaten cold. *See* Bacon; Beef.

FLANNEL: Its Treatment. Fabrics not made from all wool cannot legally be sold as flannel unless qualified by some other word. Ceylon flannel, for example, is an accepted name for a wool and cotton mixture, and Canton flannel for an all-cotton cloth. Various district flannels have a celebrity of their own. Welsh flannel, apparently the original one, is of a slightly different character from Yorkshire, Lancashire, and Irish flannel.

The difference lies largely in the sort of raw wool used in the several localities, as some are softer than others, and hence warmer and more soothing when worn next the skin. White flannels which are used for underwear are sulphur-bleached like blankets. Natural flannels are of a greyish or brownish mixture colouring, and this shade originated by the inter-mixture of wool from brown and black sheep with white fleeces. A similar colouring is now often the outcome of mixing wool dyed for the purpose. Grey flannels are made in several shades by blending white, blue, and black wool.

Flannels are also woven with stripes and checks in light and dark colours for men's shirts, but not all wool shirtings are strictly entitled to the name flannel.

White flannels are made for cricket and tennis trousers in a heavier material than for shirts and underwear, and West of England flannels are especially to be recommended.

The fancy flannels sold by tailors for summer suits in striped and other patterns with threads in several colours are of no constant character, although generally light, soft, and warm. They vary considerably in their capacity to keep their shape when made into garments. Good tailors allow carefully for the shrinking propensities of the flannels they sell.

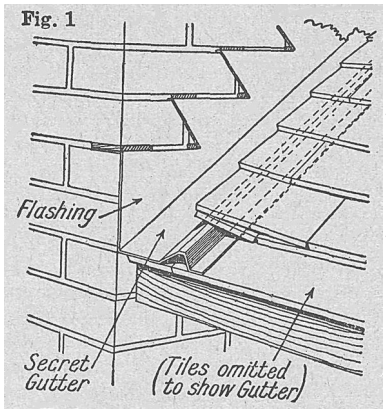
More or less all flannels shrink upon washing, and the disposition to shrink is greatest in those made of the softest and finest wool. In dealing with baby flannels it is well to dry them by hand before the fire, counteracting the shrinkage by gently pulling out the fabric in each direction as drying proceeds. Harsh flannels shrink less because of the nature of the wool from which they are made. There are chemical processes, requiring very careful control, by which woollens can be rendered unshrinkable, but these are not invariably efficacious or beneficial to the finished effect.

The heavy West of England flannels made for trouserings, and for blue blazer coats, are treated slowly and laboriously in course of making, and this, while adding appreciably to the cost, adds also to the satisfaction in wear. Cheap flannels can be quickly produced which are exceedingly difficult to distinguish at first sight from the superior qualities, and dissatisfaction with them accounts in part for the superseding of flannel by other fabrics.

The easiest method of making a flannel seam is to join the two edges of flannel with a running stitch a little more than ⅛ in. from the top of the material. The right sides of the two pieces must face inwards. Neaten the edges with sharp scissors, open and press the seam flat and turn down the edges of the flannel on to their own pieces of material. Then commence from the left side, and catch the extreme edges down to the materials by a herring-bone stitch. Flannel seams used in the making of babies' clothes, flannel blazers, etc., are finished with a binding of narrow silk ribbon pressed to give a neat, flat appearance. *See* Blanket; Bleaching; Laundry.

FLANNELETTE. An all-cotton cheap imitation of flannel, flannelette is made in a variety of qualities, and can be had white, dyed in plain colours, and with either woven or printed designs. Some are twilled, others plain. Countless burning accidents have occurred from leaving flannelette-clad children near an open fire, and the inflammability of the material is its greatest drawback. Almost any fabric will burn if kept in sustained contact with flame, and the objection to cheap flannelette is not that it can be burnt, but that flame leaps along its hairy surface, quickly enveloping the wearer. To guard against this risk, the first essential is a fireguard, and care in keeping matches out of the way of young people. The second is to buy a good quality of flannelette with not too much fluff on the surface.

FLASHING: Brick and Stone. This name is given to an impervious material which is turned up into the joints of brickwork, or into a groove or raglet, about 1 in. deep, cut in stonework. It is intended to prevent injury to the brickwork by rain splashing from the roof, and in addition to form a watertight connexion between the tiling or roof covering the adjacent brickwork. The best material for this work is sheet lead of a thickness known as 5 lb.



Flashing. Fig. 1 Stepped side flashing with secret gutter.

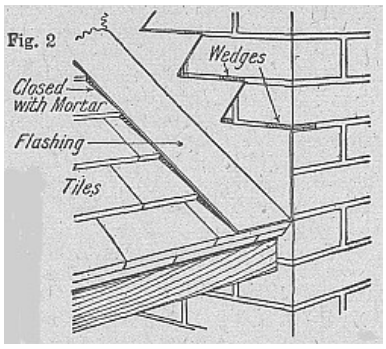


Fig. 2. Simple cover flashing.

The flashings shown in Fig. 1 are fitted by cutting a strip of the lead to a suitable length, with one side cut into a series of steps equal in depth to the distance between the brick courses. The upper edges are then bent over and inserted into the joints between the brickwork, for which purpose the mortar has to be raked out, the metal secured with wedges, and the joint pointed in cement. The other part of the flashing is turned under the tiles or roofing material, and in good work is worked over a board with a V-shaped fillet or tilt, upon which the tiles are set. There is thus extra covering which assists in resisting the entry of water.

The above relates to a common form of stepped side flashing. Occasionally a flashing known as a cover flashing is employed in a similar manner, but rests upon the top of the tiles (Fig. 2). Various arrangements of horizontal cover flashings are given in Fig. 3. The householder will do well to see that flashings against exposed brickwork are in sound condition. *See* Gutter; Roof.

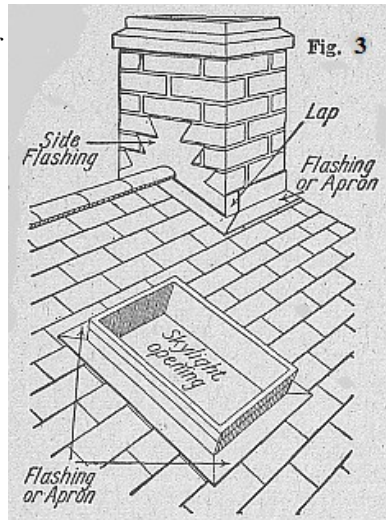


Fig. 3. Examples of horizontal cover flashings.

FLASHLIGHT: In Photography. For photography at night, both indoors and outdoors, flashlight in the form of magnesium powder, or the mixture sold as flashlight powder, offers great possibilities. Magnesium ribbon burns too slowly; the easiest and safest form is magnesium powder, burnt by being thrown through a flame.



Flashlight. Fig. 1. Flashlight for magnesium powder made of churchwarden clay pipe with cotton wool soaked in methylated spirit round bowl.

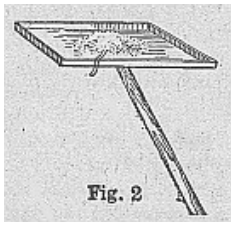
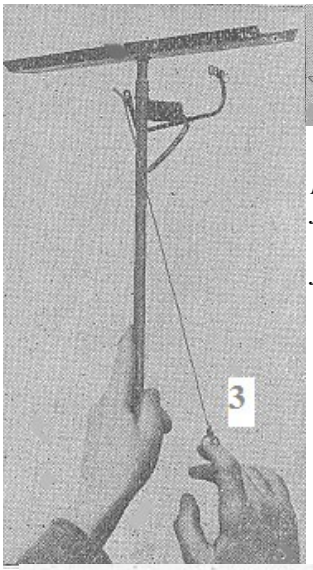


Fig. 2. Home made tray for powders.

The apparatus consists of a narrow cup in which methylated spirit is burnt, and an inner cup in which the magnesium powder is placed. The spirit is lighted, and when the photograph is to be taken the rubber bulb is pressed firmly, blowing the powder through the flame and giving a brilliant flash. An easily contrived home-made alternative is shown in Fig. 1, consisting of a long-stemmed clay pipe, round the bowl of which is fastened a piece of wick or cotton wool with wire. This is soaked with methylated spirit. The bowl is filled with magnesium powder, the cotton wool lighted, and air blown sharply through the mouthpiece, by means of a piece of rubber tubing with a bulb.

Be sure that only magnesium powder is used; if any of the flashlight mixtures are put into this type of lamp a dangerous explosion is likely to follow.

Flashlight mixtures are perfectly safe when used correctly, but the amateur should not make them himself. Flashlight powders give a much more powerful light than magnesium powder. They should be burnt in an open tray of some kind. The simplest form is a flat lid of a biscuit tin; the end of a broomstick is sawn off at an angle and the tin lid affixed to it by means of a nail, as shown in Fig. 2. This gives a forward slope to the apparatus, so that the light of the flash is thrown well, to the front of the operator. A strip of touch-paper with the flash powder heaped on it provides ignition.



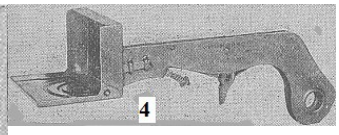


Fig 3. " Easilight" for flash powders. Fig. 4. Johnson's flash-lamp. Fig. 5. Smoke-trapping apparatus for flashlight. (Fig. 3, courtesy of Ensign, Ltd.; Fig. 4, courtesy of Jonathan Fallowfield).

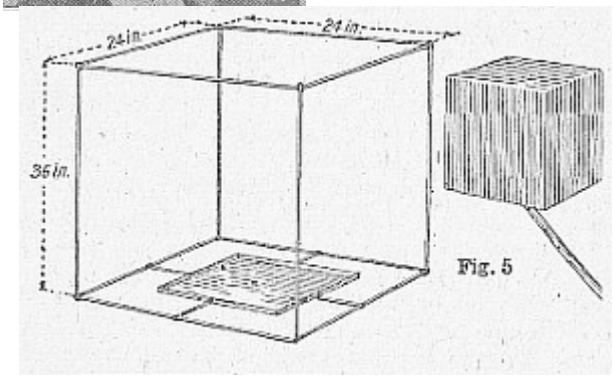
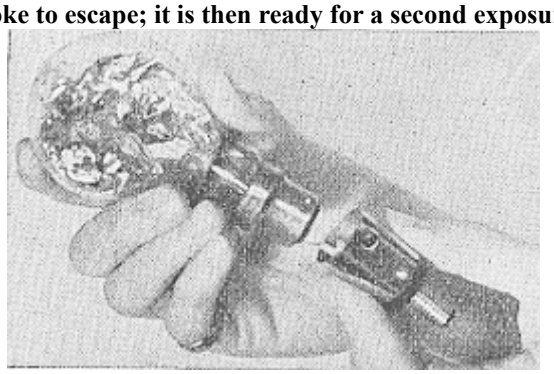


Fig. 5

Two satisfactory forms of flashlight lamp are shown in Figs. 3 and 4. In the first the powder is on a tray, elevated on a cane or long stick: it is fired by bringing a lighted taper into contact with it. The second is in the form of a pistol, the flash powder being lighted by a percussion cap. For ordinary purposes in a room with light-coloured walls to reflect the light, a heaped teaspoonful of flashlight powder will give good results with a subject not more than 10 ft. from the camera, and a lens of not less than f8 aperture and a fast plate. For larger rooms with lenses of f11 aperture or less, and ordinary films, a heaped tablespoonful should be used.

In all flashlight work indoors the utmost care must be taken to see that the flame does not come anywhere near curtains or other inflammable material.

One great disadvantage is the smoke. The only way of getting rid of the trouble is to use an apparatus in which the smoke is trapped. Fig. 5 shows a form which can be made at home. The framework is wire or bamboo, covered with tracing cloth or muslin which has been treated with fireproofing solution. The flashlight is fired by means of a touch-paper, and afterwards taken out into the open air to allow the smoke to escape; it is then ready for a second exposure.



Flashlight. A Sashalite bulb being fitted to an adapter which screws into the unit.

FLASH BULBS. Flash bulbs are the most convenient means of obtaining small flashes. Fired electrically from a small pocket battery, they are clean, easy to operate, and free from noise or smoke. They can be used in wind or rain and in positions which would be dangerous with any other type of flashlight. "Sashalite" bulbs, for instance, are sealed glass bulbs containing finely beaten aluminium foil and oxygen at low pressure. The advantage of such a rapid flash (about 1/75 sec.) is obvious, and the soft light contains a high percentage of red and blue rays, helpful in colour photography. Photo flash-bulbs are easily synchronized: synchronization of camera shutter and flashlight makes it possible to use the camera in the hand, facilitates very rapid exposures, and allows flashlight to be used in conjunction with other lighting. Synchronizing powder flashes (e.g., the Barrett synchronized flash-pan or the Driggs-Faber flash-pistol) is more difficult. In these two kinds the flash trips the shutter; in others, the shutter fires the flash. Others work electrically, using a small electro-magnet.

FLASH POINT. The lowest temperature at which the vapour given off by oil when it is heated slowly will flash up if ignited is termed the flash point. It should be noted that this is not necessarily the point at which the oil will burn, which is known as the fire point. Flash point of mineral lubricating oils varies from 300 to 600 deg. F. For ordinary lubricating oil it is about 350 deg. *See* Lubrication; Oil.

FLATS: SOME HINTS ON FURNISHING

Making an Attractive Home for the Town Dweller

See the entries Bachelor Flat; Basement; also those on the various rooms, e.g. Bathroom; Bedroom; Dining Room; Kitchen. Consult too Carpet; Colour; Cooker;

In the future anyone who has to live in the central districts of a big city seems destined to dwell in a flat, as this type of residence appears to be on the rapid increase owing to the high cost of land and the consequent necessity for more people to live under the same roof. Special furniture, heating and cookery equipments are being designed for flats, with a view to increasing comfort and convenience and at the same time taking into consideration the necessity of space saving.

Advantages and Disadvantages. From the family point of view flats have certain advantages and disadvantages. The rent of a flat usually includes rates and taxes, and sometimes lighting, an arrangement which simplifies the estimating of expenditure. The initial outlay of starting housekeeping in a flat is considerably lower, as less furniture is required. The fact that all the rooms are on one floor minimises the labour of housework, compared with houses with one or more floors.

Where the family are out a great deal and no regular maid is kept, the porter can receive parcels and take charge of the flat, thus giving a greater sense of security. Flats are particularly convenient for those who have a house or cottage in the country where they spend week-ends or holidays. A flat has also a distinct advantage over a house in that the latter cannot be left for long periods without getting damp, while the former, having occupied rooms either above or below, or both, remains comparatively dry.

The disadvantages of flats render them less suitable residences for families where there are young children. The entire lack of garden with its playing space within sight and call is a serious drawback. Many men also dislike this absence of a garden, and the cooped-up feeling of a small flat is objectionable to them. They like their own front door and their own back garden where they can grow flowers and plants, and, if space permits, fruit trees and vegetables. The absence of a garden also renders home laundry work, important where there are small children, exceedingly difficult, even with a specially fitted drying and airing cupboard. Without this modern arrangement, to dry a quantity of children's garments and household linen in the kitchen of most flats is too inconvenient, apart from the difficulty of keeping the laundered articles a good colour when drying them under such conditions.

It is also sometimes troublesome to check the consumption of coal, when this is stored on the ground floor, as is usual in many blocks of flats where the porter is responsible for bringing up the required amount daily. The scuttles must be put out by a definite time, or they are not filled. The disposal of house refuse presents some difficulty, especially in hot weather, unless absolute cleanliness is the rule. In flats where a kitchener is fixed, all combustible refuse, including dust, can be burnt. Broken china and glass and old tins are practically all that need go into the dustbin. Where a gas-cooker is used, all refuse has to go into the dustbin, and this must be emptied daily.

House dwellers have more freedom with regard to music, dancing, etc., than those who live in flats, where practically all sounds are heard by neighbouring residents. Eleven o'clock is the usual hour after which unnecessary noise must be avoided. Even the careless shutting of doors and heavy walking may annoy a neighbour who is a light sleeper. Pet animals and singing birds are frequently barred in agreements, and even window boxes may be taboo. In short, occupiers of flats must be prepared to sacrifice a little of their individuality and study the communal interest.

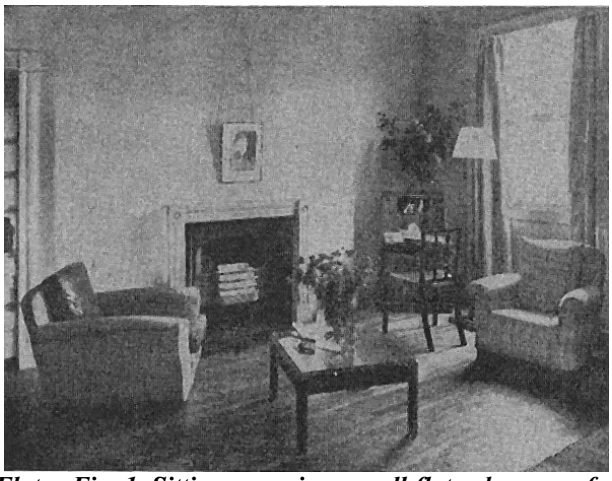
Modern Furnishing. Kitchens in flats are usually small. It is important that the equipment should be of the labour and space saving kind. The smaller the room the more necessary it is to keep it spotlessly clean, free of anything likely to collect dust, and to have a place for everything, rather after the manner of a well-designed caravan. Ideas for such arrangement and equipment will be found in the article on Kitchen.

The decoration and furnishing of larger flats presents no particular problem. It is in the case of small rooms where every inch of space has to be utilised without being overcrowded that ingenuity and good selection are required. When buying furniture it should be chosen for its practical value as well as for its decorative appearance. If it takes up too much space it will not look decorative.

A writing-desk is best selected that can give the maximum amount of drawer accommodation, and therefore the merely beautiful writing table with cabriole legs but little storage capacity for papers will be eschewed in favour of a practical bureau or desk. The book table, the divan, the wardrobe compactum, the sectional bookcase, the fitted corner cupboard and dresser and the drop-end table are all suitable pieces for flats. In very small dining rooms and dining recesses metal furniture looks well because it is suitable. A step-shaped wall bookcase, the top of one "step" at a convenient level for a reading-lamp, and that of the lowest for an occasional table, is another useful piece of furniture Rounded corners, sunken handles and flush edges are all excellent points in space-saving pieces.

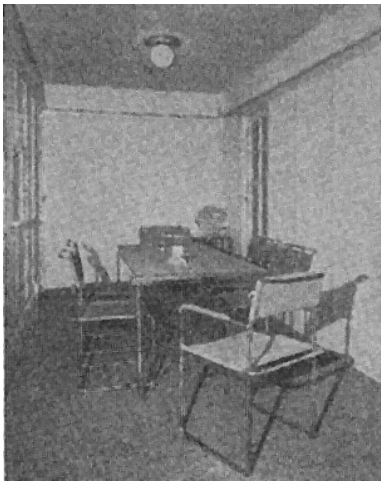
The Illustrations Described. Fig. 1 shows an interesting example of a sitting room in a small flat. Comfort is ensured by the big easy chairs, with their pleasing upholstery, while the plainer surfaces of floor and painted walls give an effect of space increased by the facts that there is neither frieze nor cornice and that the ceiling is in one colour with the walls. The window and fireplace treatments are particularly good. The architrave designed for the former successfully obviates a curtain fabric pelmet, while the fireplace treatment has effectively disguised the usual ugly small mantelpiece found in many flats of this size. Just indicated on the left of the photograph is a convenient recess fitted with shelves for books and glass.

The other illustrations are of an ordinary London flat which has been treated in a style specially designed to do away with superfluity and yet achieve decorative value by means of good, line and colour. The dining room end of the living-room is furnished with chairs having frames of metal tubing, red canvas being used for the backs and seats. The table and small sideboard are topped with heavy opaque glass and framed in metal. The window treatment at the other end of the room is particularly attractive, aluminium strips being substituted for pelmets, while the outer curtains are brown and the glass curtains of pale yellow voile. The walls, distempered in light buff, are left bare of pictures. The writing table is a beautifully designed but simple piece of furniture in natural oak.



Flat. Fig. 1. Sitting room in a small flat, where comfort is allied with an effect of spaciousness (Humphrey & Vera Joel).

Cupboards play an important part in flat comfort, and many practical suggestions will be found in the article on them. Wherever there is available space in hall, passage or bathroom it should be utilised for a cupboard in which to store linen, plate, glass and china. If the hall and passage are dark and narrow, light-coloured walls are essential to create an illusion of space; if there is an angle turn in the passage a lighting fitting placed there will illumine both hall and passage.



Flat. Fig. 2. Dining recess in the living-room of a London flat. The frames of chairs and table are of chromium-plated metal-tubing.

Legal Points. The law governing flats is, in the main, similar to that for ordinary dwelling houses, as for legal purposes a flat is a separate house. Dealing first with unfurnished flats, the tenant who is about to take a flat must determine what his tenancy will be—yearly, quarterly, or monthly. He can take a lease of a flat for a number of years or for a shorter period.



Flat. Fig. 3. The window treatment in the living-room of a London flat, the dining recess being shown in fig.2.

The chief thing is to have a proper agreement in which are set forth the term of tenancy rent, stipulations as to repairs, etc. Careful study of the agreement before signing will prevent trouble later. Particularly should the tenant note his position in regard to repairs, the amount of rent, and period of notice required to terminate the tenancy on either side. A schedule of fixture should be provided by the landlord. Occupiers of flats usually pay an inclusive rent, the landlord paying all rates and taxes. Gas and electric light are usually not included in rent.

In the case of flats where a number of tenants use a common stair and entrance, the precise obligation of each tenant in the matter of cleaning and lighting should be clearly defined.. Where there are only two or three flats in a building the tenants usually come to an arrangement as to their respective share in cleaning and lighting.

Particular attention must be paid by tenants of flats in the matter of nuisances. Mats should not be shaken from a window so as to cause annoyance to the tenant in the flat below. Any noise, also, that disturbs the rest of the tenants, above or below, beyond what is reasonable, constitutes a nuisance, as also are late singing or playing on a musical instrument. If carried to excess and continued to a late hour a tenant or tenants can get a court injunction to have it stopped. A professional singer would be entitled to practise in a flat, but not at a late hour. The occupier of a flat must not leave objects on a landing so as to annoy the other tenants, e.g. bicycles, prams. All these matters are usually dealt with in the tenancy agreement.

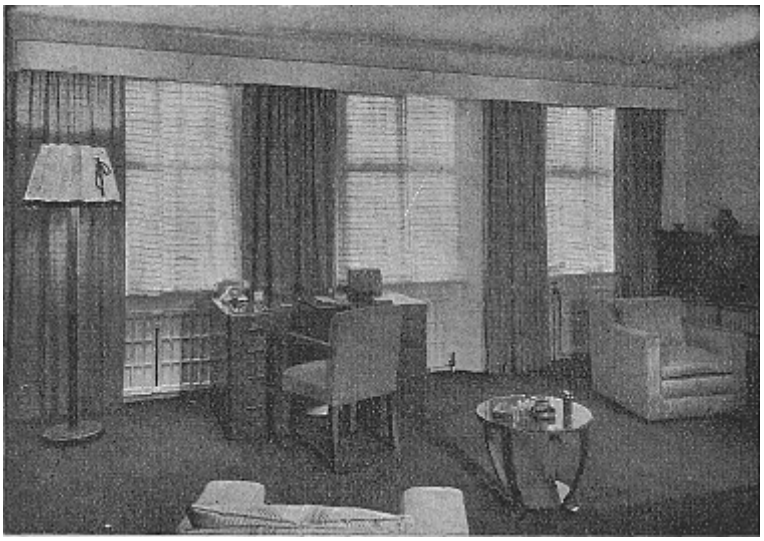
In the matter of sub-letting care should be taken to see whether the agreement requires that the consent of the landlord should first be obtained. A tenant within the Rent Acts who sub-lets all the premises loses the benefit of the Act, i.e. he can be turned out.

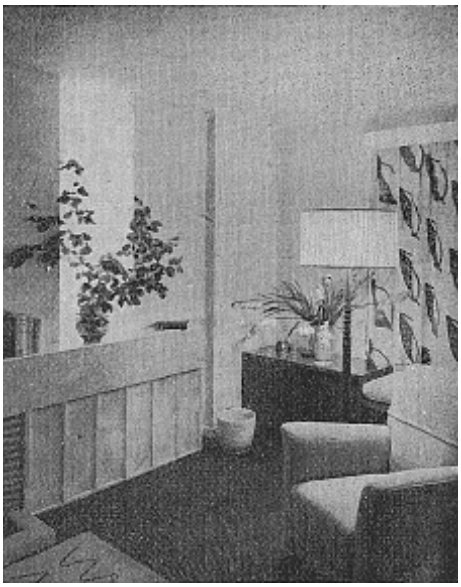
Furnished flats are preferred by many persons, and these are governed by much the same conditions as regards tenancy as unfurnished. The rent is higher, and they do not come under the Rent Act. The chief precaution here is to see that the owner or superior tenant furnishes a complete inventory of all furniture

(Continued in page 843)

FLATS: COMPACT LIVING BROUGHT TO PERFECTION

Most of these photos are of a beautifully designed flat in a small block that has the air of a charming country house set in a London garden. Top: two schemes for sitting rooms. Left: windows to give maximum daylight. Right: artificial "niche" lighting.

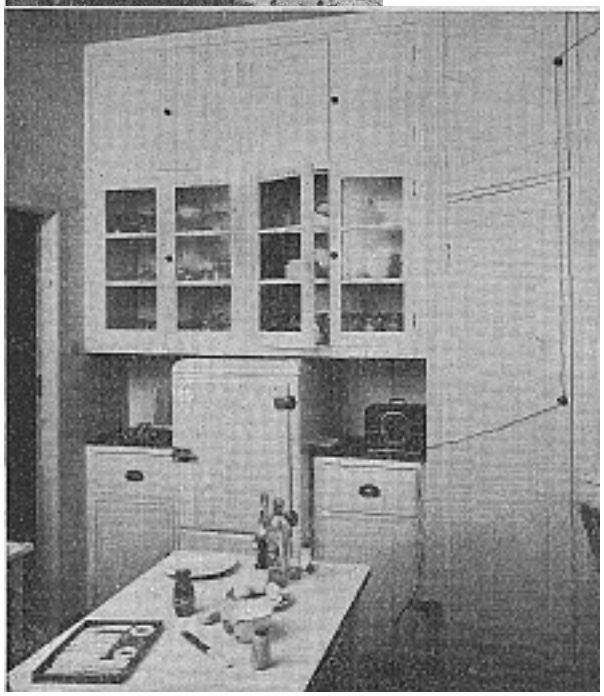




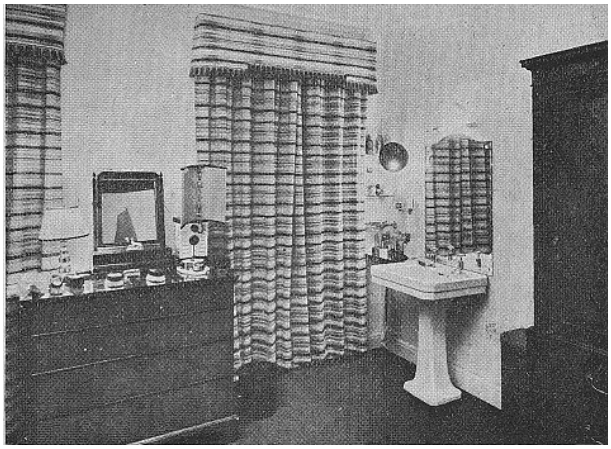


Left: a glazed chintz patterned with lilies-of-the-valley is used generously in the bedroom. Walls and woodwork are a creamy peach; the carpet is sage green, matched by painted furniture.
Right: a corner of the dining room, folding table against the wall.





Left: a well-equipped kitchen all in white, relieved with red-and-white curtains and red composition floor. Below: gay and sober contrasting motives for a bedroom, assisted by strip-lighting and various electrical devices.



and fixtures. Household and table linen are not as a rule included therein.

In a case where a tenant having a lease of a flat sub-lets it to another party he is still himself liable to the landlord for the proper upkeep and conduct of the premises. If the sub-tenant proves undesirable he must be given notice to quit, and, failing that, a court summons must be taken out. Most landlords will stipulate for no sub-letting, or they will want to be satisfied as to the desirability of the sub-tenant.

A house may not be structurally converted into flats without the permission of the local authority, though a man can let his house to two or three tenants if he wishes, provided no change is made in the structure, and call these sets of rooms flats. For rating purposes he must acquaint his local collector of his action. This conversion into flats is highly technical, and legal advice should be obtained.

FLAT FOOT: Its Treatment. This is a deformity in which the normal arch of the foot sinks and the sole tends to turn outwards, so that the person walks more on the inner border of the foot. Most frequently it is due to a gradual weakening and stretching of the ligaments and muscles which maintain the arch, from much standing. Acute cases are treated by putting the foot into plaster of Paris, thus ensuring rest for the overstretched structures.

From the outset in ordinary cases, the patient must be supplied with proper boots. These should be roomy enough, and the inner side of the boot should be raised ⅓ in. This is done by putting a leather wedge on the heel, the base of the wedge being on the inner side. The heel is also prolonged forwards on the inner side for ¾ in. A similar wedge is put on the sole of the boot. The result is that the patient walks more on the outer side of the foot and the ligaments are saved from stretching. Even when his boots are off, the patient should be scrupulously careful that his weight is taken mainly on the outer side of the sole. The leg muscles should also be strengthened by tiptoe exercises, massage and electricity. A cold foot-bath at bedtime, followed by dipping the feet alternately in basins of hot and cold water, are helpful. *See* Foot.

FLAT IRON. In the ordinary household a flat iron is the most usual implement for ironing linen, etc., though in towns it has been largely replaced by the electric iron. Flat irons are sold by weight, and 4 lb. is a good medium size, though the professional laundress uses both heavier and lighter ones. *S e e* Ironing; Laundry.

FLATTING. In painting, a flat or lustreless surface is produced by the use of flatting paints. These are so prepared that they dry up with a dead surface like distemper, but with the lasting qualities of good oil paint, and when thoroughly dry and hard can be washed with soap and water. Such surfaces lend themselves to stencilled designs and similar ornamentation. Flat colours are obtainable from any oil and colour shop. *See* Paint.

FLATULENCE: Its Relief. The accumulation of gas in the stomach or intestines is a very common and troublesome affection. In the stomach it may be due to dilation of that organ, the narrowing of the opening through which the digested food passes into the intestine, or to any other cause which allows fermentation to occur. People who eat in a hurry or do not chew their food properly, and those who allow bad teeth to remain unattended to, are frequent sufferers, and the affection is common in hysteria. Flatulence in the intestine is mostly due to fermentation of food caused by bacteria in cases of constipation.

For temporary relief any one of the following carminatives may be taken: ½ teaspoonful of tincture of ginger in a wineglassful of warm water; 2 or 3 drops of oil of cajuput on a piece of sugar; ½ to 1 teaspoonful of compound tincture of cardamoms in water; 10 to 20 grains of compound cinnamon powder.

For intestinal flatulence measures must be taken to prevent constipation (q.v.). In this form, which usually becomes troublesome two or three hours after a meal, intestinal antiseptics should be used. Useful drugs here are salol in five-grain cachets twice daily between meals. A pill which gives good results is made up thus, one being taken when the flatulence is troublesome and the dose being repeated next day if necessary:

Menthol	12 grains
Calomel	12 „
Powdered ginger	16 „
Glucose to make	8 pills

See Diet; Indigestion.

FLAVOURING: In Cookery. One of the most important processes in preparing a successful dish is the flavouring, which is generally added last. No hard-and-fast, rule can be laid down as to quantities: the safest way is to use all flavourings sparingly, and for the cook to taste as she adds.

Where sweet dishes are concerned, the most common flavourings are vanilla, almond, and lemon. Vanilla can be procured either as an essence, of which one or two drops only are required,or in the form of a pod. The latter is boiled with the milk or other substance, and removed when the preparation is cooked. Almond essence is used in the same way as vanilla. These essences are added as the preparation is removed from the stove.

Almond flavouring is given to a custard or similar mixture by dropping a laurel leaf into the milk and bringing it to the boil. The leaf should then be taken out. Lemon rind boiled up in the milk to be used for a custard or milk pudding, etc., will give a delicate lemon flavouring; but care must be taken to pare the lemon rind very thinly, so that none of the white pith adheres, or a bitter flavour will result. A bay leaf gives a much-liked flavour to savoury dishes, minced meat, etc., and

is also used for pickled herrings.

For soups and other savoury dishes a favourite flavouring is a bouquet garni. This consists of sprigs of parsley, mint, thyme, blade of mace and a bay leaf, which are tied in muslin and put into the dish, being taken out before the dish is served. Other flavourings that are much used are nutmeg, ginger, cinnamon, allspice, mixed spice, and cloves. Celery seeds, parsley, chervil, and tarragon are used as flavourings for soups and sauces, and a few drops of essence of anchovies, tomato ketchup, and mushroom ketchup are also much favoured in savoury dishes. To give a delicate onion flavour to a salad, rub the inside of the bowl with piece of onion or garlic. *See* Almond; Clove; Essence; Onion; Spice, etc.

FLAX. There are some lovely garden flowers among the flaxes, suitable for the flower garden and rockery. They flourish best in well drained or rather light soil. The best two for the average garden are Linum perenne and Linum narbonense, which grow about 18 in. high and bear blue flowers in summer. Linum flavum and Linum arboreum, 10 to 12 in. high, with yellow flowers in summer, thrive best in the rock garden. Linum grandiflorum rubrum is a hardy annual with bright red flowers; from seeds sown out of doors in March-April, it blooms in July. The perennial kinds are easily propagated from seeds sown out of doors in April.

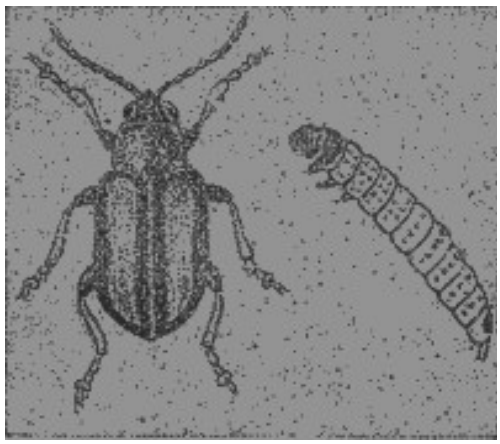


Flax. The yellow flax (Linum flavum), a charming rock garden flower

FLEA. The flea is a carrier of plague from rats to human beings. To get rid of fleas, dust the sheets with insect powder or sprinkle them with essence of peppermint. The underclothing should also be sprinkled with peppermint essence or a few drops of chloroform here and there. Dogs and cats should be washed every week or two and dusted with an insect powder. For the irritation of a flea-bite apply a dilute solution of carbolic acid or of ammonia. *See* Insecticide.

Fleabane. *See* Erigeron.

FLEA BEETLE. This insect, also known as the turnip flea, is a minute beetle, of which there are many allied specimens. They vary in length from ⅛ to 1/12 in.; the thigh joints of the hindermost legs are strongly developed, which gives them power of leaping like fleas. The most familiar and most destructive of these has a longitudinal stripe of yellow on each wing-case. The mature beetles pass the winter in hiding under any rubbish left on the ground, and in spring when the seedlings of turnips appear they swarm on the young leaves, nibbling small holes in them until they become useless to the plant, which weakens or dies. The female beetles also deposit white eggs in batches on the lower surface of the leaves, which hatch about ten days later. The young grubs of the flea beetle bury themselves in the tissues of the leaves upon which they feed.



Flea Beetle. Left, mature specimen of the turnip pest. Right, larval form.

The pest should be dealt with first by clearing the seed ground of all debris which will shelter the beetles in winter. If, however, the seedlings are already attacked, they should be sprayed with a solution of soft-soap, quassia, and paraffin in water. To give the seedlings a chance of surviving the attack, the seeds should have been sown thinly, a course producing more sturdy plants. A scattering of nitrate of soda, 1 oz. per yard run of row, is helpful because it encourages the seedlings to grow quickly. Many of the beetles may be captured and destroyed by sweeping the seedlings with a butterfly net. Applications of lime and of soot are beneficial. *See* Insecticide.

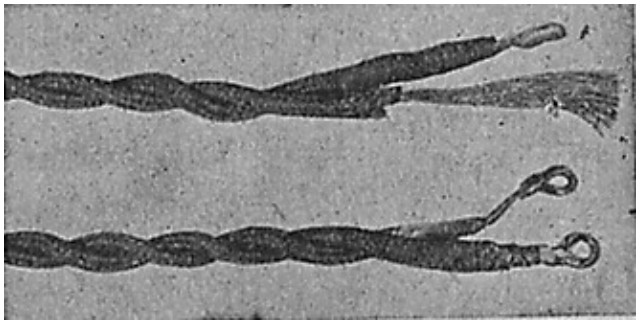
FLEECE. Fleece is the coat of wool shorn from a sheep, but the word is also used to describe any soft, woolly material of a fleecy nature. The kind generally employed in dressmaking consists of a thin, machine-knitted woollen web, made specially with a view to being wire-brushed and having a fuzz of fibre teased to the surface. It is used for lining gloves, house slippers, and children's winter coats. The lining should fit the article exactly, and should be put in while the garment is in the making, not after it is finished. *See* Wool.

FLEX: In Electric Fittings.

This word is an abbreviation for a flexible insulated wire, generally used to connect movable electric fittings to a convenient point of supply of current. The

ordinary flex, as found in domestic use, is of three types. The common bell flex consists of two separate stranded wires, each composed of a number of very fine wires, and each separately insulated from the other; they are usually braided on the outside and then twisted together. Bell flex should not on any account be used for electric lighting appliances.

Lighting flex is similar, but comprises more fine strands, each of them larger in diameter than those in the bell flex, and the insulation is more robust. The heaviest form of flex wire is that known as workshop flex, and is again more substantial than ordinary lighting flex. It is usually braided on the outside over both of the wires, or may have an outer covering of a rubber compound. Such flex should be used for electric heaters, small motors, the vacuum cleaner, etc.



Flex. Construction of flexible wire ends: above for push-in terminals; below, for terminal nuts.

Flex should never be used if it is in a damaged condition, since, if the insulation is worn or cut, there is great likelihood of its breaking down and causing a short circuit. If the covering of the wire shows signs of wear or damage (e.g. where it enters a plug or lamp), new connexions should be made, the wire being cut back till a sound portion is reached. If the rubber insulation has perished a new length of flex should be substituted. The connexion of flex wires to electric light fittings should be done with great care. The insulating material must be removed to leave exposed the two separate bundles of stranded wires. These should be wiped with a piece of emery paper, and each bundle twisted together. The ends are turned over at right angles and doubled back upon themselves. The wires can then be inserted in their place in the fittings, and secured with a set screw in the usual way.

Where the flex is to be attached to a binding screw or terminal contact post, and secured by means of a nut, the wires are twisted round into the form of an eye. In either case it is essential to prevent any single strand of wire becoming separated from the rest, as this might cause a short circuit.

FLOAT: In Plastering. This tool is used by plasterers to lay on plaster and to bring it to a smooth or fine surface. It can be made from ordinary deal or other wood, but must be perfectly smooth in the face and very slightly rounded on the edges. The back should have a conveniently shaped handle set lengthways, as Figs. 1 and 2. *See* Plastering.

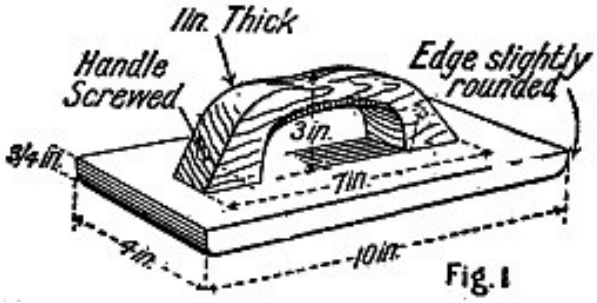


Fig. 1

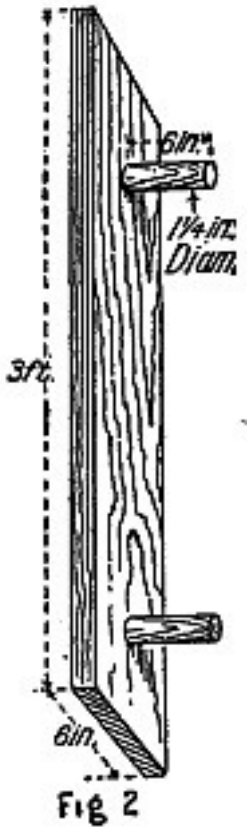


Fig 2

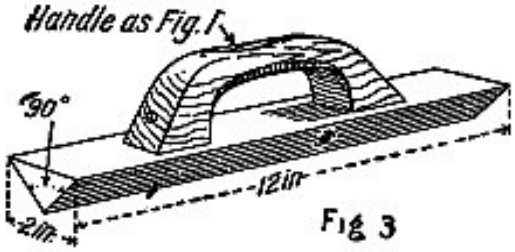


Fig 3

Float. Diagrams showing dimensions and details of three types of plasterer's floats. Fig. 1. Hand float. Fig. 2.Derby float. Fig. 3. Angle float.

FLOCK. The material known as flock is manufactured from the refuse of wool or cotton, or from old cloth or rags that have been broken up by a machine called the devil. Wool flock is used for cheaper upholstery and mattress stuffings, but its drawbacks are its liability to attacks of moth, and its tendency to harden into lumps.

Cotton flock, although neither so light, nor springy as wool flock, is said to be free from the danger of

moth, and is extensively used for upholstery in spite of its tendency to become seedy or lumpy after constant use. The least popular flock is that made from rags, but its employment need not now be feared, since under the Rag Flock Act (1911), the sale or manufacture of unclean flock is prohibited, and rag-flock must be sterilised and purified to a standard of cleanliness laid down by the various local authorities. *See* Bedding; Mattress; Upholstery.

FLOCK PAPER. This name is given to a variety of wallpaper covered with flock, or fine powder obtained from cloth and similar material. The use of flock paper for special decorative panels or miniature carpets in a doll's house, or to represent a lawn or grass on a model of a house, is effective. *See* Wallpaper.

FLOORS AND FLOOR COVERINGS
Methods of Construction and Repair

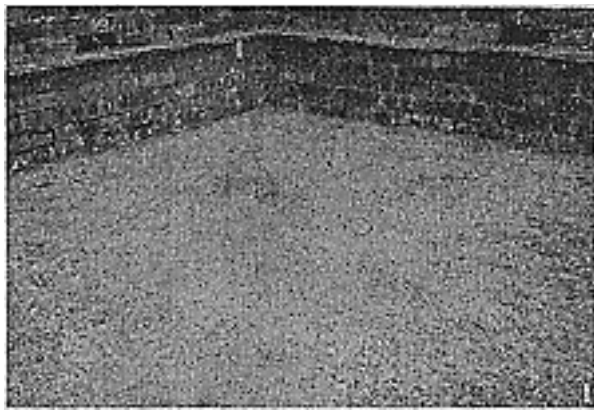
Various constructional and other articles in this work deal with the subject of floors and flooring, e.g. Architecture; Board; Bungalow; Cottage; House; Joint; Wood. See also Amateur Carpentry; Carpet; Damp Course; Linoleum; Rubber, etc.

The importance of a good sound floor to any dwelling cannot be over-estimated. Health and comfort alike demand a floor that is even and level, free from draughts and immune from damp.

The simplest floor is laid directly upon the earth, and many old country cottages still have floors of rammed earth, generally covered with bricks, stone slabs, or flooring tiles. Picturesque as they may be, such floors are always cold, prone to dampness, and generally very uneven. The best treatment is to remove the old tiles or bricks, excavate the earth for a depth of about 6 in., lay a good sound bed of concrete floated off level, and re-lay the bricks upon this foundation, after having treated the surface to a generous application of hot tar or asphalt. The bricks or tiles will be set in mortar and well grouted. Those badly worn can be laid upside down if the under side is in good condition. This saves buying new bricks.

Most dwelling-houses are floored with timber, consisting of flooring boards averaging 1 in. in thickness and 5 to 6 in. in width. These may have plain edges or be tongued and grooved, the latter being more rigid and draught-proof. Any wooden floor laid near the ground must be well insulated from dampness and thoroughly well ventilated. This is accomplished by first covering the whole site with a bed of concrete at least 4 in., and preferably 6 in., thick. The appearance of such a bed ready prepared is illustrated in Fig. 1.

Two courses are now open; one is to insulate dampness by treating the surface of the concrete with a thick coating of tar or mastic, and to lay the flooring direct upon it, having previously coated the under side of the floor-boards with some wood preservative. This method has disadvantages, including the absence of ventilation, and it results in a hard and unyielding surface. If the site is sloping, much making up is necessary. A damp course is needed, and adds to the expense.



Floor. Fig. 1. Concrete floor-covering before laying joists and floorboards.

Wood Floors. Taking everything into consideration, a wood floor is best if laid on joists in the usual way. Particular attention is directed to the following points: the sleeper walls which support the plates upon which the floor-joists themselves are supported, the presence of air-bricks beneath the floorboards, and the double course of damp-course slates. Figs. 2, 3, and 7 show the relative arrangement of the parts.

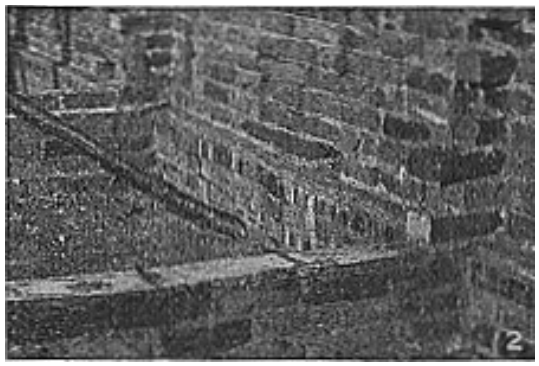




Fig. 2. Sleeper walls, showing damp course slates, upon which floor plate and joists are laid.
Fig. 3. Floor joists and sleeper walls for a ground floor.

In such constructions, when the joists span the opening between the sleeper walls, they are known as bridging joists and the floor as a single floor; it is the simplest and the strongest construction. The joists are

usually spaced from 12 to 15 in. apart, their size depending upon the length to be spanned without support. Sizes of timber usually adopted are 4 in. by 2 in. for the ground-floor joists of small houses with rooms about 12 ft. wide, provided they are supported at intervals of 4 ft. or so by a sleeper plate and a honeycomb wall or supporting piers of brickwork, topped with damp-course slates, somewhat as in Fig. 3.

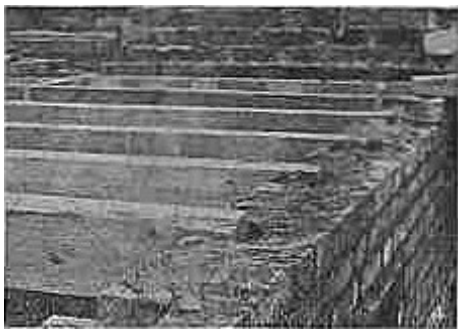


Fig. 4. Joists built into brickwork.



Fig. 5. Trimmers and trimming joist, showing tusk-tenon joint.



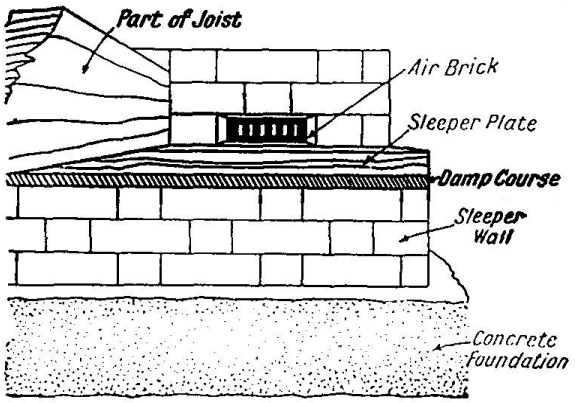
Fig. 6. Flooring and joist around a staircase well or opening.

The upper floors are constructed in a similar manner. A wall plate of timber is set into the brickwork, and upon this are set the flooring joists, which have to be of such strength that they can safely carry the load. Usual dimensions are 4 in. deep by 2 in. thick for an opening 5 ft. wide, but when the opening or span is, say, 10 ft. wide the joists should be 6 in. deep by 2½ in. wide. A 12 ft. opening requires a joist 7 in. by 3 in. or 9 in. by 2 in. In the latter case light diagonal struts are used in order to prevent the joists twisting sideways.

First-floor joists should be spaced 14 in. apart, centre to centre, and when the joists are more than 8 ft. long they should be stiffened by herringbone strutting, made from 1½ in. square deal nailed between the inner faces of the joists. The under sides of the floor joists are lathed and plastered or covered with beaver or other building board.

The upper surface of the joists is floored by laying the first plank against the wall and nailing it to the joists: a second plank is then fitted up to the first and securely cramped with flooring cramps *(see* Dog), and nailed to the joists, continuing until the floor is covered.

If the nails are driven through the flooring into the joists, use the regular flooring brads, 2 in. or 2¼ in. long, and punch each one well down below the surface. This must be done when T. and G. (tongued and grooved) floorboards are used, but plain edge (P.E.) boards, especially when narrow, should be nailed through the edge, driving a nail at an angle of about 45°, as indicated in Fig. 9. This results in a smooth floor without any visible nail heads. The floor is finished by means of a plane.



Floor. Fig. 7. Diagram of principal parts of a ground floor.

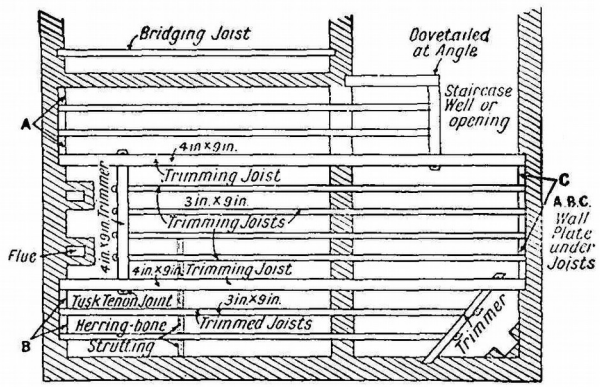


Fig. 8. Diagram of first floor, giving the names of the timber parts.

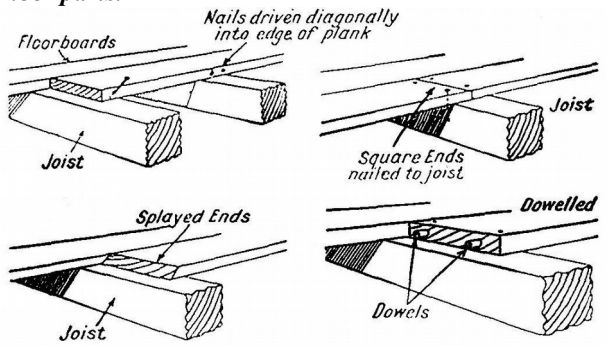


Fig. 9. Diagram illustrating the various methods of jointing ends of floor boards, and of nailing them to the joists.

Trimmer Joists. When the floor is not solid, but has an opening for a staircase, or has to be built around a fireplace or hearth, a somewhat different treatment of the joists becomes necessary. As the model by-laws prohibit the fixing of any woodwork nearer than 9 in. to any flue, it is necessary to provide a trimmer, or bridging piece, into which the ends of the joists are fitted and secured by a joint known as a tusk-tenon. Such trimmers are set securely upon wall plates, or firmly built into the brickwork, and should be at least ½ in. thicker, and of equal or greater depth, than the joists they support. Fig. 5 shows a trimming joist with trimmers tusk-tenoned.

The floorboards should not be terminated directly against a hearth or staircase opening, but should rest against a narrower board neatly mitred at the corners, and fitting around the opening. In some cases a trimmer is itself tusk-tenoned between two joists, which should be thicker than normal to carry the extra load imposed by the trimmer. A diagonal fireplace set in the corner of a room may have a trimmer tenoned into one joist and supported at the other end on the brickwork. Fig. 8 shows various customary arrangements of trimmers and joists and the names given.

Floorboards should be laid in long lengths, spanning the full width of the room, but whenever a joint has to be made it should invariably come over a joist, as shown in Fig. 9. The woods chiefly used for house floors are oak, teak, pitch pine and deal. It is usual to lay the boards in narrow widths, say, 4 in. to 5 in., instead of the 6. 7, or 8 in. boards of earlier days, and the finish is generally good enough to permit of polishing.

Wood block floors are employed in better-class houses, particularly for passages, etc. They are sometimes used in kitchens. They need a concrete foundation, and there must be some kind of bituminous sheeting interposed between foundation and blocks. Usually the under sides of the blocks are dipped in a bituminous mixture before being placed on the concrete. The wood blocks can be had in from 1½ to 2½ in. thickness. Parquet floors (q.v.) are laid with wooden blocks, usually ¼ in. thick, some 9 in. long and 3 in. wide.

Composition Flooring. For kitchen, scullery, bathroom and other rooms of these kinds, it is possible to employ a jointless composition flooring by using a plastic material which sets in 24 to 48 hours. Various colours are available, and simple designs can be worked into the material. Stone and concrete floors are used in kitchens, larders, yards, and verandas. For ordinary paving purposes natural York stone is one of the best. There are also various artificial stones made with granite chippings and Portland cement, or clinker and cement. Outhouses and sculleries are generally laid with concrete or cement.

Floor Repairs. The repair of existing floors is a frequent problem. Cement floors do not present much difficulty. The bad places should be further broken away and deepened, all dust and dirt washed away, and the deficiency made good with strong cement mortar. If the whole surface has worn badly it will be better to hack it all over with a chisel and hammer. Then brush the surface clean, wet it thoroughly and recoat to a thickness of at least ½ in. with strong cement mortar (gauged cement 1, and sharp sand 2). A hard surface, free from dust, is obtained by using cement and fine washed granite chips, adding some reliable waterproofing composition.

To repair wood flooring cut out the bad boards and replace by new, making all joints in the length of the timber over a joist or other firm support. To cut out a tongued and grooved board without damage to the remaining boards, saw through the tongues, using a keyhole or pad saw with as fine a blade as possible. The board can be sawn across by prizing it up at one end, slipping a piece of batten underneath, and cutting across the board with a tenon saw.

Decorative Floorings. The simplest method of decoration for a wood floor is by staining it. This may be done with one of the branded floor stains or an excellent stain can be homemade with vandyke crystals, which can be purchased cheaply from a chemist. These are melted in hot water; the amount of dilation depends on the colour required for the floor. Having thoroughly cleansed this with a strong soda washing and allowed it to dry, the stain is painted on with a good brush. The polish is not obtained until the floor has had several subsequent rubbings with a wax polish.

Bright colourings of considerable durability are obtained by the use of the floor paints sold for this purpose by most oil and colour merchants. Such paints are chiefly suitable for bedrooms. Tiles are a decorative flooring for certain types of halls, for bathrooms, kitchens and sculleries, but as they are expensive, substitutes are used, one of the most successful being tile designs in rubber flooring. Such floorings are durable, easily laid, comparatively low priced and hygienic. They also lessen noise, which is a boon in many homes. Obtainable in different qualities, these floorings are also designed in marbled and plain effects.

Besides parquet floorings, dealt with under that heading, linoleum in its various qualities, makes and designs provides useful floor covering and surrounds for carpets.

Cleaning Floors. A painted, waxed, or varnished floor should be wiped free of dust and dirt with a soft rag, and then treated to an application of crude oil and benzine, one part of oil being used to three parts of benzine. This is a good cleaning mixture which obviates the use of water, but only a small quantity should be used at a time. It should not be allowed to remain on long and should be wiped off with a woollen rag. If the floor has a waxed surface, any good wax paste can be

applied, and the polishing done with a rag, brush, or polishing mop.

Grease spilt on unfinished wood such as a kitchen or pantry floor is best treated with cold water. The latter should he poured on at once, so as to harden the grease and prevent it from spreading. The grease may then be scraped off with a knife, and the affected part scrubbed with warm water and washing soda. If the spot appears dark after this treatment, spread over it a paste made from fuller's earth and water, leaving it overnight.

All floors should be well swept in the morning, and if of the polished type, rubbed with a soft duster or mop. For scrubbing purposes, a bucket of hot water, a floor-cloth, a scrubbing-brush, a mat for kneeling, and some good household or soft soap are essential. Commence in that portion of the room farthest away from the door, and with the cloth wet the surrounding boards. Dip the scrubbing-brush into the water, rub some soap on the bristles, and scrub the wet patch vigorously, working the brush the same way as the grain of the wood. Then wring the cloth out of the water and wipe the floor as dry as possible.

Floor Polish. Beeswax (q.v.) usually forms the main ingredient of floor polishes, but a cheap and effective substitute is to be found in tallow candle ends. To make a polish of these, melt down ½ dozen or more ends, aceonling to size, and mix the tallow with 1 pint each of paraffin oil and turpentine.

Florence Cream. This is a name given to a salad dressing of the mayonnaise type. *See* Mayonnaise.

FLOSS SILK. Used in needlework, floss silk consists of silk fibres so lightly twisted together that the thread spreads out and gives a glossy appearance. The stitches must be short, for the silk frays easily. A 2-ply or 3-ply floss is the best, and embroidery floss should be asked for by name, as there are many varieties of twist. Boiling colours are to be preferred. See Embroidery; Silk.

FLOUNDER. One of the commonest of the flat fish found in English waters is the flounder. Its flesh is nutritious, and is easily digested. It should be well washed and rubbed over with salt an hour before it is to be cooked. Dry the fish well and dip it into beaten egg and then into breadcrumbs before frying it in hot fat. Serve it garnished with some fried parsley.

To boil a flounder put it in a fish-kettle with just sufficient water to cover. Add salt and a little vinegar to taste, then bring it to the boil and simmer gently for about ten minutes. It should be served with anchovy or parsley sauce. Flounders can also be grilled. *See* Grilling.

FLOUR. Fine soft powder prepared from grain, e.g. cornflour, rice flour, maize flour, wheat flour, etc. If flour is mentioned without any indication as to source, wheat flour is implied.

Flour is described as soft or hard. Soft flour is made from wheat that has a low percentage of gluten, and that of an inelastic kind. A hard or strong flour has a high proportion of gluten, and that of a tough kind, which becomes elastic under certain influences when made into dough.

For short bread, piecrusts, biscuits, or scones, only the soft flour should be used, because, in these goods the shortening agent is butter or fat, and the aerating agent baking powder, and neither fat nor baking powder has the property of softening gluten and making it elastic. If hard flour is used it should be sifted first. If bread, or something fermented by yeast, is to be made, then only hard or strong flour may be used. The yeast possesses the property of making tough gluten very elastic, and as the yeast produces gas from the sugar of the flour, so the elastic gluten retains it, and bread of large volume is thus made possible.

The colour of flour is in some respects dependent on the wheat used, on the method of milling, or on the grade. White wheats make white flour, and red wheats produce a yellowish tinge. If the flour has been made in a stone-grinding mill—a method very nearly extinct now—it will be darker than if made in a roller mill and, as a rule, will not keep so long sound.

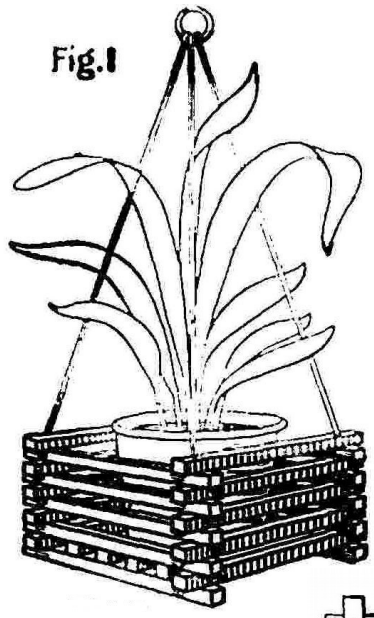
For some years there has been a growing practice of bleaching flour, generally with nitrous oxide gases, but also with chlorine. This takes away the yellowish colour, but the quantity used is so minute, and there is so little left in the flour, that no deleterious effects can be discovered in the baked articles. Certain other substances, called persalts, are also used to effect a slight bleaching action, while calcium and other phosphates are sometimes added to make soft flour somewhat stronger.

Flour Hutch. Regarded now as an antique piece of furniture, this was originally used to hold flour and bread. The hutch is a form of cupboard standing on four legs and strengthened by stretchers. The lid is on the top, and inside are usually two divisions, one for bread and the other for flour. Most of the existing pieces are of oak. With a little ingenuity a hutch can be converted into a modern piece of furniture; for instance, a dresser. In this case a back is necessary, the hutch itself serving for the cupboard.

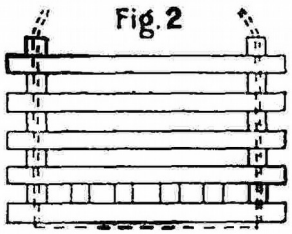
Flour Sifter. This term usually implies either a flour dredger, used for small quantities, or a wire sieve for larger amounts. The object is to aerate and thus lighten the flour, and to remove lumps or any foreign matter. An ordinary sifter requires shaking before the flour will pass through, but mechanical ones are obtainable inside which, by turning a handle, wire rings are made to revolve, thus forcing out the flour. *See* Baking; Bread.

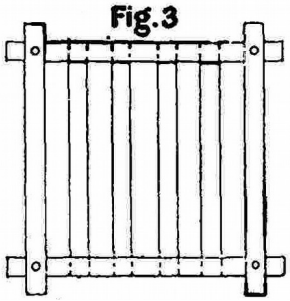
FLOWER BASKET. Hanging flower baskets as shown in Fig. 1 are intended to hold a potted plant, and are very useful in the garden, conservatory, or hall. They are easy to make, and provide a means of putting

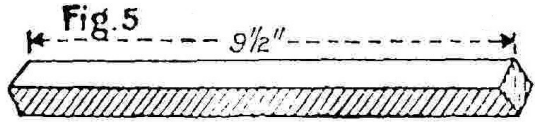
any waste strips of wood to a useful purpose. If deal is used, it would be best to finish with paint, leaf green being suitable. Any hardwoods could be left plain, or stained and polished with linseed oil.

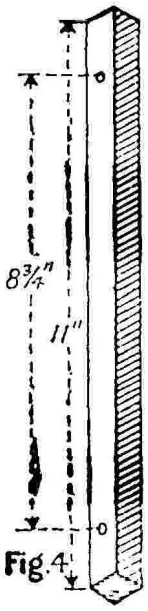


Flower Basket. Figs. 1-6. Hanging basket for a pot plant and method of making it from waste strips of wood.









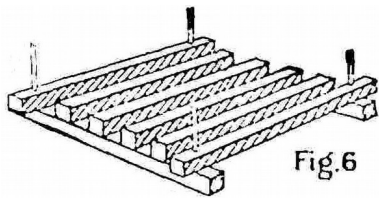


Fig. 2 shows an elevation, and Fig. 3 a plan of a basket of useful size, in the making of which 20 strips similar to Fig. 4 and four strips similar to Fig. 5 will be required. The strips are intended to be ¾ in. square, but sizes may be altered as required. The baskets are wired together, holes being bored through the long strips for the purpose. Two wires are used, one at each side, and each runs through the bottom strip and up through the corners, as shown by the dotted lines in fig. 2. Galvanized or copper wire is most suitable, each piece being some 6 ft. long. In building up, thread the wire through two strips, and across these thread two other strips, as shown in Fig. 6. The bottom is formed by nailing the short strips over the bottom strips, and the basket is completed by threading the remaining strips over the wires. Care must be taken to have the ends of the wire which project above of equal length; they are twisted over a stout ring, which is used for hanging (Fig. 1). *See* Basket Plants.

FLOWER BED. Flower beds, preferably of simple design, are made on the lawn and in other parts of the garden and filled with massed flowering plants for the purpose of ensuring a brilliant show of spring and summer bloom. They are planted in October with bulbs and spring flowering plants and late in May or early in June with others which will bloom throughout summer and autumn. *See* Bedding Out.

FLOWER GARDEN. The chief features of a modern flower garden are the herbaceous border, formal flower beds, rock garden, shrubbery planted chiefly with flowering shrubs, lawn, and water lily pool, with perhaps an adjacent bog garden. The little formal garden, its beds and borders intersected by paved paths, is fashionable and is generally represented even in plots of restricted size.

The principal needs of most hardy flowering plants are a sunny position and deeply dug and manured soil, and if those are provided there is every likelihood of a successful issue. The herbaceous border of hardy perennial plants is perhaps the most important feature of all, for, if planted with a representative selection, it will remain gay throughout the summer and autumn months.

Any kind of land can be made suitable for a flower garden by correct cultivation. Clayey ground is improved by autumn and winter digging and by adding such materials as lime, finely sifted coal ashes, old potting soil, sand, grit from garden paths, leaf-mould, decayed garden rubbish and wood ashes from the bonfire. Light land is improved by digging in leaf-mould, decayed garden rubbish, pieces of turf, hop manure, and stable or farmyard manure. It is better to apply the manure in spring and to fork it in lightly than to dig it in during the autumn or winter.

Planting may be done in autumn or spring or in mild weather in winter. Some of the chief hardy herbaceous perennials are lupin, delphinium, phlox, Michaelmas daisy, erigeron or summer starwort, geum, peony, pyrethrum, bellflower, columbine, sea holly or eryngium, globe thistle or echinops, evening primrose, purple sage, mauve catmint, shasta daisy, coneflower or rudbeckia, and perennial sunflower. The spaces between the perennial or permanent plants are filled with gladiolus, lily, montbretia, and dahlia, and with hardy annuals, of which seeds are sown in spring. Sweet william and Canterbury bell may also be planted in autumn to bloom the following summer.

Formal flower beds on the lawn or elsewhere should be of simple design; those of elaborate shape cause a good deal of labour and they are not so pleasing as circular, rectangular or oval beds. It is usual to fill them with spring bulbs, wallflowers, polyanthus,

forget-me-not and other early flowers by planting in October. In late May or early June these are taken up and are replaced by summer flowering plants, e.g. zonal geranium, marguerite, lobelia, tuberous begonia, snapdragon, dahlia, etc.

The rock garden must be in a sunny place, and the site must be well drained; if these conditions are provided, and if leaf-mould, sand, grit and stone chips are added freely to the mound of soil, most of the rock garden plants will flourish.

There are so many beautiful flowering shrubs which are hardy in Great Britain that there is no longer any excuse for a shrubbery planted with uninteresting evergreens. By making a suitable selection one or another of them will be in bloom throughout the spring and summer months. Some of the chief kinds are early spring heath (Erica carnea), Forsythia spectabilis or golden bell, broom, Pyrus floribunda (flowering crab), Japanese cherries, rhododendron, azalea, laburnum, mock orange, lilac, guelder rose, bush honeysuckle or weigela, hydrangea, ceanothus and witch hazel or hamamelis.

How to Make a Water Lily Pool

A water lily pool can be made a delightful feature even of a small garden. It must be in a sunny place, for water lilies will not bloom well in the shade. Some of the small water lilies will flourish in water 18 inches or so deep, so an elaborate excavation is not necessary. By lining the sides and bottom with stones and covering these with cement, it is not difficult to make a watertight pool. The water-lily plants should be put in mounds of soil at the bottom of the pool in early May; the use of a few large stones will keep the plants at the bottom of the water. The moist soil at the margin of the pool provides an ideal home for bog plants such as monkey musk, Iris sibirica, Japanese primrose, and many more.

A delightful formal garden can be made by filling the beds with some of the old-fashioned flowers such as columbine, poppies, peony, mauve catmint, lavender, rosemary, pansies, snapdragons, and so on, and paving the paths with stone or brick. A sundial or bird bath might well mark the centre of the garden. If flower beds are made on the lawn they should be few in number and near the edge.

Arches covered with climbing and rambling roses and clematis add to the beauty of the flower garden, and a trellis so placed as to provide a background to a garden seat or ornament could be covered with climbing plants. *See* Arch; Border; Carnation; Clematis; Climbing Plants; Daffodil; Dahlia; Digging; Garden; Herbaceous Border; Hydrangea: Lily; Pansy; Rose, etc.

FLOWERING CURRANT. This is the popular name of ribes, a genus which includes the gooseberry and red, white, and black currants and some useful hardy flowering shrubs. Ribes sanguineum, the common flowering currant, will thrive in shady places; it bears reddish flowers in spring. *See* Ribes.

FLOWERING RUSH. The common name of Butomus umbellatus, a British wild plant suitable for planting by the waterside in gardens. It grows 2 to 3 feet high, with rose-coloured flowers in summer. *See* Rush.

FLOWERING TREES. These are well suited to planting in small gardens, and might be used with advantage to screen unsightly surroundings. They provide shelter without casting too much shade. Autumn is the best time to plant, though the trees may be put in the ground in spring and in mild weather in winter. Some of the most ornamental are the flowering crabs (Pyrus spectabilis, floribunda, Eleyi, and others), thorn, laburnum, Magnolia conspicua, the purple-leaved plum (Prunus pissardi), Japanese cherries, and lilac.

FLOWER POT. Flower pots of burnt clay are too familiar to need description, but as nurserymen usually refer to them by name or number, their sizes in inches, taken from the diameter at the top of pots, are given to prevent confusion. Thimbles, 2 in.; thumbs, 2½ in.; small sixties, 3 in.; large sixties 3½ in.; fifty-fours. 4 in.; forty-eights, 5 in.; forties, sometimes called small thirty-twos, 5½ in., large thirty-twos, 6 in.; twenty-fours. 8 in.; sixteens, 9 in.; twelves, 10 in. The sizes may possibly vary slightly according to different makes. *See* Potting.

FLOWERS AND THEIR ARRANGEMENT

How to Make the Most of Floral Decoration

The reader is referred to the entries on the various flowers mentioned in the article, e.g. Carnation; Rose; Tulip; as well as to Bouquet; Bulb; Colour; Table; Vase, etc.

Unless a pantry and sink are available when arranging flowers, it is best to place a tray with vases and bowls on a table, the bunches of flowers on a newspaper, with another one spread at hand for rubbish; a big jug of water, scissors and a knife complete the preparations. To obviate the use of newspapers and afford complete protection to a sitting-room table, the American cloth tidy illustrated is a useful accessory to flower arrangement, and one which is quickly made. It requires a yard of brightly coloured American cloth, a cotton galon to tone, a pair of scissors attached to the latter, and a motif of floral cretonne applied to a corner of the tidy by means of buttonhole stitch. *(See* Appliqué.)

If not arranging the flowers in a flat bowl the lower leaves should be removed, as they choke up a vase. All woody stemmed flowers, such as lilac, roses, chrysanthemums, will last better if the stalks are peeled at the ends so that they are free to absorb water.

Should flowers not seem very fresh they may be revived by being placed in quite warm water. The water should be changed at least every second day, and

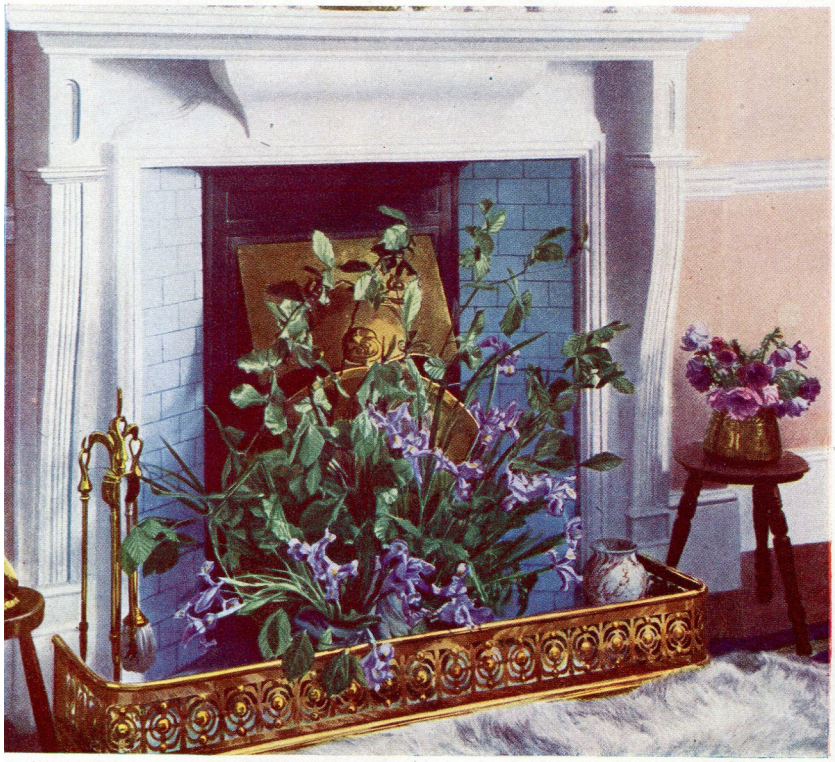
(Continued in page 855)



Tulips and Spanish Iris for a Corner



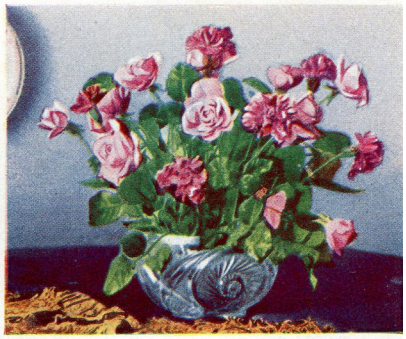
Tulips and Bluebells in a Bowl and Bluebells in a Vase for a Side Table



Spanish Iris and Beech Leaves arranged in front of a Fire Screen. Right, Japanese Windflowers



Sea Lavender (Statvs) and Ixia



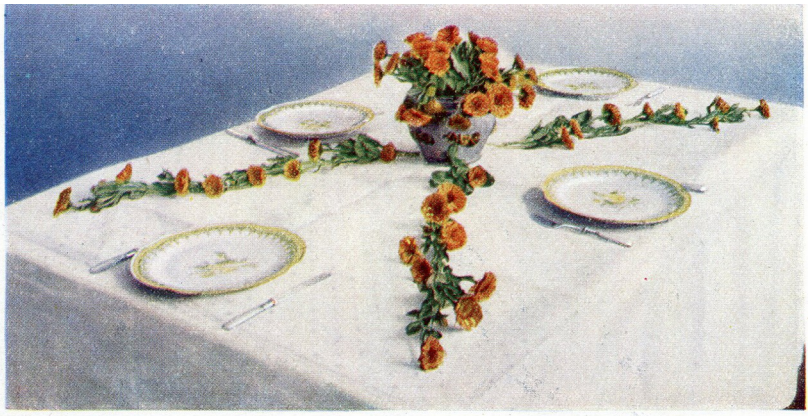
Roses and Carnations in a Crystal Bowl

FLOWERS: GRACEFUL ARRANGEMENT IN BOWL AND VASE

See under heading Flowers for hints and suggestions, as well as other illustrations in black and white.



Tulips in a Brass Bowl for the Hall

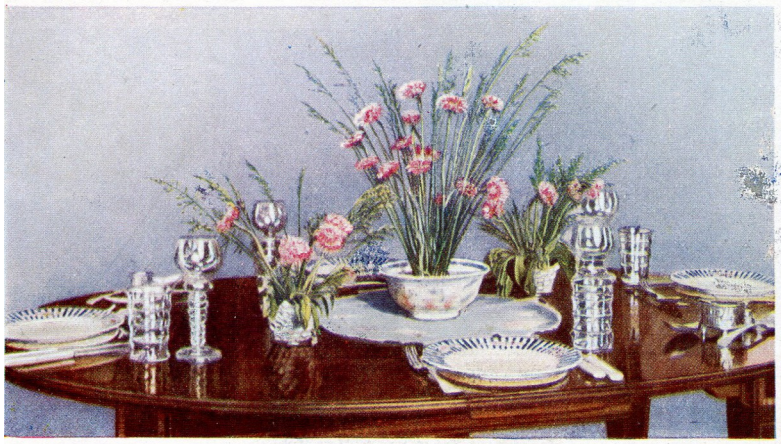


A simple but attractive arrangement of Marigolds on the Table





Scented Pink Peonies and Mauve Spanish Iris arranged in Japanese style



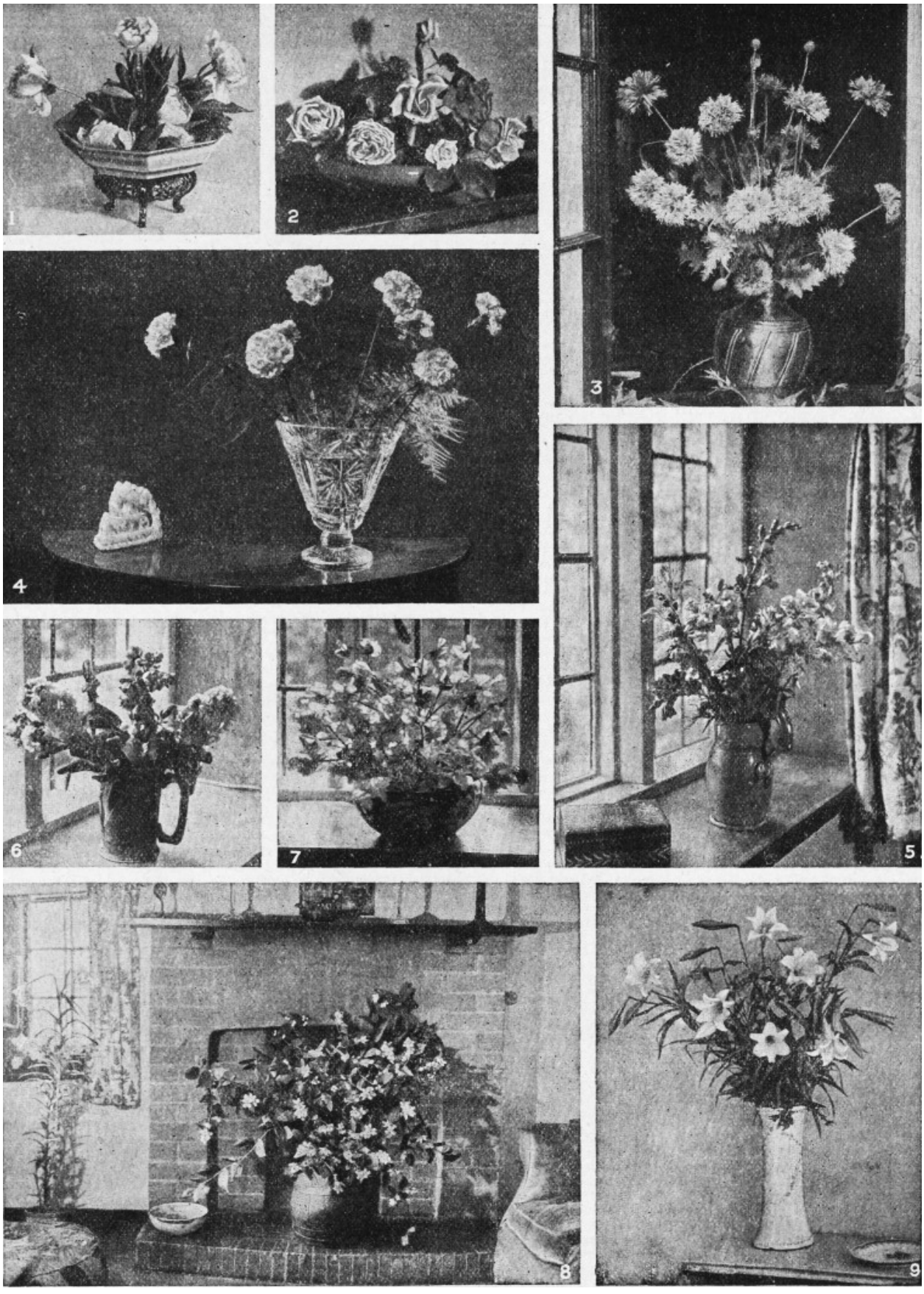
Pyrethrum and Grass on a Polished Table set for Luncheon



Roses floating in an Alabaster Bowl

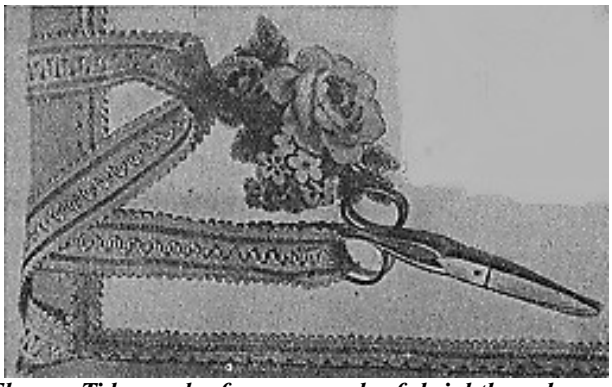
FLOWERS: TABLE DECORATION IN VARIOUS STYLES

Suggestions for the arrangement of bowls on dinner or luncheon table.



FLOWERS IN THE HOME: SUGGESTIONS FOR THE ARRANGEMENT OF MANY BEAUTIFUL VARIETIES. See text. (By courtesy of Webb & Corbett)

when flowers suddenly become limp the stalks should be cut again. If cut flowers have to be bought, it is worth remembering that they last much longer when they are just coming into their natural growing season than when they are forced or when the species are practically over for the year. Flowers also last longer in well aired rooms than in stuffy ones.



Flower Tidy made from a yard of brightly coloured American cloth, a motif of floral cretonne being applied to a corner, as shown below. The scissors are attached to the cotton galon edging.



Japanese Ideas. Japanese influence has affected the arrangement of flowers. It is no longer thought sufficient just to stick a bunch into a vase, but rather to make each arrangement a piece of decoration, taking into consideration the relative characters of the flowers, their supports and containers, the colour of the walls, etc., and the shape required to make a pleasing effect. Thus an arrangement of peonies in a bowl, as shown in page 854 Fig. 1, would be suitable for a table or a bookcase below the eye level and where the view from above would take in the rather bushy nature and the flat setting. The pink peonies are held in position by a glass flower block and are placed in a grey blue bowl, the effect being further enhanced by an ebony stand. Bowl arrangements look particularly well on such stands, and plainer ones are available in lacquered wood of various colours. They are not only decorative but protect the table from water marks. Glass squares, ovals or rounds also serve the latter purpose and are suitable for tall vases.

Varieties of holders and blocks are sold which enable flowers to be placed so as to form a good design, the line of the water in the vase or bowl being taken as the soil, and the stems supported to suggest natural growth. Most bulb flowers can be treated in this way, and look their best in flat bowls, rising from a bed of moss. Under the moss can be concealed a support, made of strips of lead, each about 2 ft. long. 1 in. wide, and 1/12 in. thick, which can be obtained at any iron-mongers. These strips are bent round the bottom of the stems, the lead being twisted backward and forward between the flowers to keep the balance.

While daffodils and tulips are happy in shallow water, flowers with short woody or fibrous stems are better when placed in bowls if supported by deep glass blocks. The beautiful arrangement of pink and yellow roses in a black Wedgwood bowl, Fig. 2, has been achieved with the aid of such a block, and so has that of the sweet peas in Fig. 7. Again, both these flower arrangements are for a position at a table level, and the pottery bowls are well chosen to set them off. Sweet williams also require to be massed in a wide vase or bowl, and certain other flowers, such as primroses, wallflowers, and pinks, whose great charm is in scent and colour rather than in form. Tulips are an example of flowers which require a background of wall to look their best, owing to their beauty of line.

Carnations are essentially flowers which look best with a detached treatment of bloom. In a cut-glass vase, as seen in Fig 4, they are perfectly suited. The asparagus fern softens the slightly hard effect of the stalks supported by a wire holder. Geraniums require a formal treatment and look well in a square glass with maidenhair fern. Violets also are a joy in a low crystal vase.

The decorative note is stressed in Fig. 5, an arrangement of Fire King snapdragons in a pale green jug, set on an oak window-sill and harmonising with the printed linen of the curtains. Such long-stalked summer flowers require depth of water and are better placed in a tall jug or vase. Stocks are beautiful in a pewter tankard, as seen in Fig. 6, the pink, mauve and plum-coloured tones of the flowers and their delicate greenery contrasting exquisitely with the grey metal.

For Heavier Flowers. Where it is desired to get a beautiful effect with heavy flowers or sprays of flowering shrubs, an easy method of support is the following: Choose a big, wide vase of some metal or strong pottery. Measure the top opening across and cut two strips of thin wood to fit. Lay these about ½ in. apart and nail some cross way pieces about 1 in. from the end; this forms a slot. After soaking in water to make the wood swell a little, place this rough framework about 1 in. from the top of the vase, wedging it in. Because of the wedging, this method is not suitable for glass or china vases. The flowers will rest in the slot, apparently growing from the centre of the vase. Such a support could be used to assist an arrangement of mock orange blossom by the possessor of a Somerset cider jug or other large suitable receptacle, such as a big copper vase, to form the delightful empty grate screen shown in Fig. 8. Through the summer bold arrangements of foliage and tall

flowers such as foxgloves, gladioli, dahlias, and Michaelmas daisies can be used in this way to decorate a country sitting-room.

High graceful flower arrangements form entirely satisfactory corner furnishings, and particularly decorative in a dark corner are tall white flowers in a white vase. White lilac, chrysanthemums and madonna or Harrisii lilies are all suitable for this purpose. The last named are shown in Fig. 9, brightening a dull hall. Another charming scheme for a hall window-sill is seen in Fig. 3. Here opium poppies make a brilliant show of colour in a hammered brass vase. Nothing could give a more inviting welcome to an oak furnished interior unless it was a square tall vase of amber glass containing bronze chrysanthemums. It is a point worth noting that these flowers must be placed in deep water as, unlike certain others, they do not last well in bowls.

Mixed flowers can be used to create beautiful effects for the table or to be set against a wall. Colour and shape must be well considered. Such mixtures as pink tulips, mauve irises and various kinds of the narcissus family can be well arranged together. Short stalked cottage garden flowers are delightful mixed with apparent carelessness in a green pottery bowl. Another scheme for the country room would be marigolds, cornflowers, big white daisies and field grasses in a pewter jug. Mauve lilac and pink peonies will make a handsome corner decoration. Later in the year dahlias in a pinky mauve shade will look beautiful with mauve scabious, and if arranged in a big jar spikes of pink gladiolus may be added with excellent effect.

Winter Decoration. In the winter months tall spreading arrangements of foliage and berries, such as spindle, the various barberries, cotoneasters and rowans will brighten rooms when flowers are scarce. Another floral decoration which pleases the thrifty housewife is achieved with honesty. Beautiful effects can be obtained by using the flat silvery seed pods of this old-fashioned plant in their natural state combined with those dyed in shades of pink and mauve against a background of dark evergreens. Baskets of dried everlasting flowers are liked by some people and can be made attractive combined with statice in mauve and yellow and the introduction of sprays of conifer foliage.

The seed heads of candytuft also remain fresh for a long time in water and look charming in a silver or pewter mug against a dark background. Physalis, with its orange scarlet Japanese lanterns, will look beautiful with pine foliage and branches of larch, the stems and cones of the latter dusted with silver frost powder after the fashion of Swiss Christmas bouquets.

Packing. When it is desired to forward flowers by post it is best to cut them in the cool of the day and put in water some time before packing in a cardboard box. Layers of thin wadding between each layer of flowers help to keep them fresh, and it is a mistake not to pack as closely as possible without crushing the blooms.

Flowers for funerals should be sent to the house early on the day fixed. The old custom of using only white flowers has been modified and there is nothing to forbid the use of coloured ones for this purpose. Roses, carnations, tulips, in fact flowers of all colours, made up into wreaths, crosses, etc., may be sent. If in the announcement of the death it is also mentioned that no flowers are desired, such wishes naturally will be respected.

Pressing. Some people like to press botanical specimens while they are away on a holiday or at other times, while children sometimes do this as a hobby. Such specimens are best carried in a metal case when they are picked and should be pressed shortly afterwards in a botanical press. Sheets of white blotting paper, cotton wool, photographic paste and a small paint brush are needed. For mounting the dried flowers either an album is required or the specimens may be mounted on loose sheets of thick drawing paper and stored in a cabinet obtained quite cheaply for this purpose.

FLOWER SHOW. In Great Britain July and August are the chief months for flower shows. The following suggestions are offered to those gardeners who may desire to enter the lists at the local horticultural society's show, but who do not know the way in which exhibits may be prepared and staged to the best advantage. Those interested should secure the society's schedule as soon as issued, study its various classes, and select those in which it is desired to compete. They should study the rules and send the entry form carefully filled in to the secretary well in advance of the advertised date for closing.

The next matter of importance is concentration upon the cultivation and management of those plants from which exhibits will be drawn. If cut bloom is the object in view, these generally will be taken from the hardy plant border. Plants selected should have fairly frequent doses of weak liquid manure, alternately with watering. Cut out all weakly flower spikes and use them for indoor decoration, and stimulate strong growths in order to reach perfection.

Flowers for a show are best gathered during very early morning, and after they have been placed in clean, soft water should be sheltered in a cool, dark space until ready for packing. If the show is a long distance away they should be sent in an exhibitor's box, which will allow them to travel in good order. If the show is near at hand simply place damp moss round the stems and pack them in boxes lined with clean tissue paper.

Roses and Sweet Peas. Roses that are grown for exhibition purposes require attention not only for stimulating cultivation, but also for intelligent disbudding. The best blooms will need shading from bright sunshine when they are opening, bearing in mind that on the morning of the show it will be the opening bud that will be the right one to cut, as its expansion will have developed just about the time when judging is taking place. Tie a band of soft wool

round the bud before cutting and do not remove it until the blooms are staged. Always cut with long stems, and see that flowers are sprayed with clean water from a very fine sprayer.

When arranging sweet peas see that the spikes are so placed that each is clearly visible, and be careful to put only the exact number in each vase, as called for in the show schedule. Each variety must be correctly named, and apart from form and colour, perfect freshness is absolutely essential.

Pot specimens of such plants as fuchsias, zonal pelargoniums, tuberous begonias, etc., will require stopping or disbudding well before the show, and a safe rule is to remove all flower stems appearing above the leaves at least a month in advance.

Most exhibitions have classes for table decoration. Points towards success are lightness and grace combined with simplicity of colour and daintiness. Overcrowding is a fatal mistake, and it is too often forgotten that ample space should be left for diners.

Make sure that exhibits are strictly according to schedule, otherwise disqualification may follow. If a class calls for six blooms do not include seven. Cut all blooms before the sun gets on them, and they will retain their freshness until the crucial moment of judging.

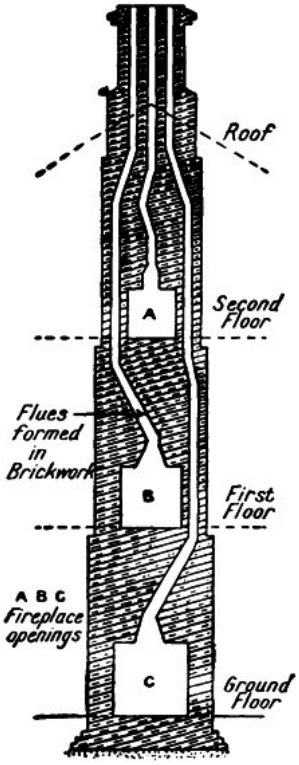
Do not stretch time too fine on the morning of the show, and remember that whether your exhibit is finished or not nobody will be allowed in the tent while the judging takes place. Clear up all rubbish from the neighbourhood of your stand, and, after putting everything in proper order, leave the tent and await results. If in doubt or difficulty go to the secretary, but do not worry this busy official unnecessarily. *See* Carnation; Chrysanthemum; Rose. etc.

FLOWERS OF SULPHUR. This is another name for sublimed sulphur, which occurs as a gritty yellow powder. It is used internally as a laxative, and is especially useful in chronic constipation, piles, and chronic rheumatism. The dose is 20 to 60 grains, and it may be taken with marmalade or in milk or treacle. Externally, in an ointment, it is used in scabies or itch, and in other skin complaints. In chronic rheumatism benefit may be derived from sprinkling the affected part with flowers of sulphur in fine powder and wrapping flannel bandages round. *S e e* Laxative; Sulphur.

FLUE: In Chimney and Range. Flues are internal passage ways or channels to discharge the smoke and fumes from a fire, foul or hot air from a room, or to supply fresh air. In a cooking range the flues are the internal channels by which the hot gases are conducted past the oven or boiler, as desired.

A brickwork construction with one or more vertical flues is generally known as a chimney stack. A typical stack is shown in the accompanying diagram. In domestic architecture a flue is usually carried out in brickwork, and is part of the fabric of the building. Flues for gas fires may be formed in the wall itself.

In a dwelling-house a flue deals with the smoke, conducts the heated and foul air from the room, and acts as a ventilator. Consequently it should never be closed up, unless other means of ventilation are provided. Most flues have been designed for open fireplaces, intended for the use of ordinary coal, and in these cases the grate should be deeply recessed. The back should slope towards the front, so that the smoke has to curl over before ascending the flue proper. The cross sectional area of the flue should be as small as possible and the sides as smooth as practicable, in order to present the minimum of resistance to the ascending air.



Flue. Showing how flues are gathered into a single chimney stack.

To retard down draughts and to stop the passage of rain in wet weather, all flues should have at least one bend with an easy slope. The height of the flue opening above the roof should be at least 3 ft. above the ridge or adjacent roofs, and in restricted areas the height can with advantage be much greater.

Ventilating flues are constructed in brickwork in much the same way as a smoke flue, but the opening is often long and narrow, as such an arrangement can be built into the cavity between two walls. Such flues ter-minate on the exterior in a special elbow or bent box having an opening and flap valve. Indoors the flue openings may terminate in the form of a cast-iron grating with a movable cover, permitting the flue to be opened or closed at will.

Portable coppers, central heating boilers, and fittings of a like character are usually provided with a flue pipe made of cast iron. All such flues must be kept well away from any woodwork, and, where they pass through a wall, should have a proper cast-iron wall box or plate built in. This type of flue can economically be combined with a simple brick chimney stack, several of the iron flue pipes being conducted into the brick stack.

The Kitchen Range. A regular kitchen range, when built into brickwork, has a rather elaborate arrangement of flues. The provision of two or more flues is for the purpose of changing the direction of flow of the flames and hot air, dampers or controlling valves being provided to check or stop the passage of air through one flue, and to vary the cross-sectional area of a flue. Constricting the area of the flue will, up

to a certain point, increase the speed at which the hot air ascends; hence the faster the heated air ascends the more fierce will be the fire, as more air is consumed. Further closing of the damper so far restricts the flue opening that it can no longer pass sufficient air, and the fire is damped down or checked and burns more slowly. By these controlling devices the heat from the fire can be concentrated on the oven when the oven flue is open and the other closed, or concentrated on the hot-water boiler, etc.

The flues need to be cleaned weekly. To do this, open the damper and top flues, insert the flue brush in each, in turn, and twist it well in every direction. Next open the rounds on the top of the hot-plate and, with the scraper and brush, gather the soot and scrape it into the dustpan. The lower flues should be cleaned in the same way. *See* Anthracite Stove; Bricklaying; Chimney; Grate; Range; Stove; Ventilation, etc.

Flue Brush. A brush with a long, annealed wire handle is best for cleaning a flue. Four strands of stout wire are tightly twisted to grip small knots of the material which makes the brush, the remaining length of twisted wire forming the handle. For everyday use a brush is made of black China bristle, and the stiffer the quality the better. A wire brush used occasionally will remove hard carbon or soot deposits and slight corrosions. Long chimney flues can be swept out with a circular brush screwed to the top of a rod of hickory or other suitable wood; joints are made by screwed sockets, and any number of extra rods can be attached as the brush is forced up the chimney. *See* Brush.

FLUFF. The short fibre which shakes out of beddings and is swept out of carpets is collected with the dust, and is best burnt, unless, of use for the garden. It has a value as manure and may be mixed with garden soil. The fibre assists a light soil to hold moisture and contains plant food. Woollen fluff is bought by hop farmers, being specially useful in growing hops.

Fluff from the woollen cloth mills and shoddy factories is used for stuffing cheap mattresses and furniture. A kind which makes the best stuffing for pincushions is blanket cardings.

FLUMMERY. This makes a delicious and wholesome cold sweet. Wipe 3 lemons, chip off their rinds very thinly and lay them in a basin with ½ pint of boiling water and ½ lb. of white sugar for ½ an hour. Then dissolve ¼ oz. good weight of gelatine in 2 or 3 tablespoons of hot water. Strain this to the water, and add the juice of the lemons and the yolks of 4 eggs. Put this mixture into a jug, which stand in a pan of boiling water. Stir gently over the fire till the mixture thickens like a custard. On no account overheat it. Strain it, and when cool add a glass of sherry. Serve in custard glasses.

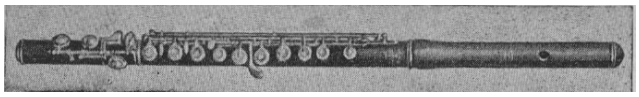
FLUSH BOX. This is a metal or wooden box or cistern used to supply a sudden rush of water to a closet. A common form comprises a galvanized iron cistern with a siphon arrangement; as the water rises in the tank the air is expelled from the siphon box, and the contents of the tank are discharged with consider-able flushing force.

The device may be used in connexion with a rain-water tank; it will then collect the rain-water as it trickles from the rain-water pipe, and store it until a sufficient quantity has been accumulated to dispel the air from the siphon box, when the contents are forcibly discharged, thus cleansing the drains. In fixing such flush tanks there must be free ventilation to the siphon outlet, and the pipe line must be free from a trap; if such a fitting exists it must be removed, or be provided with a ventilating pipe. *See* Sanitation; Water Closet.

FLUSHING. This affection is apt to be troublesome to many women at the change of life. It may be produced at other times by indigestion, eating hastily, drinking alcohol, tight lacing, and the use of tight neckwear. The remedy is to avoid the occasion of the trouble. Bromides and ichthyol are useful.

FLUSH PANELLING. In furniture this is a method of joining up stiles, panels, etc., of wooden doors so that all are on the same plane, no part projecting in front of any other. The tops of tall pieces of furniture are often treated in this way to prevent the formation of a hollow well that tends to harbour dust behind the cornice. *See* Door; Panelling.

FLUTE: How to Play. The transverse, concert, or, as it was formerly called, the German, flute is an instrument made either of ebonite, cocus, or metal. Of these materials, the best is ebonite, which resists better than cocus the deleterious effects of the moist breath. The silver flute requires a less strong embouchure than the others, which recommends it to amateurs, but on the other hand its tone is not so good.



Flute. Boehm concert flute, cylindrical. 26 in. Type in use from about 1834.

The instrument has a chromatic compass of about three octaves divisible into three registers:



The quality of the lowest register is rather reedy. The middle register, produced by increasing the air pressure, is fuller and more mellow, while the highest, produced by still greater air pressure, and by cross

(Continued in page 860)

FEBRUARY

What to do in the Garden

Flowers

Syringe azaleas, heaths, and other hard-wooded plants

Keep calceolarias, fuchsias, and other summer bedding plants at a temperature of about 50° F.

Take off tops of fuchsias and start them in gentle heat to increase supplies

Pot up another lot of lilies

Sow half-hardy annuals in boxes

Plant the herbaceous border with hardy perennial plants. Plant leaf-losing trees and shrubs. Prune winter jasmine

Transplant autumn-sown annuals

Give gravel paths a first and strong dose of weed-killer

Finish planting hardy roses

Patch and edge turf on playing lawns

Plant hedges of leaf-losing shrubs

Knock off snow, if any, from branches of evergreens with a broom or rake

Towards end of month, lower slightly the temperature in which summer bedding stuff is growing

Sow annuals in boxes for transplanting later

Fruit

Finish pruning fruit trees of every description

Give top dressing of farmyard manure, where available, to hardy fruit borders

Cut back stocks for grafting

Use the knife only lightly upon black currant bushes

Wash indoor vines, and paint them with a mixture of sulphur, soot, lime, and soap-suds

Plant a new strawberry bed

Spray fruit trees with lime sulphur

Vegetables

Sow early peas on a warm border

Sow any kinds of early salad crops in frames that can be spared

Look over stored vegetables, and take out any that show signs of decay

Set seed potatoes in a light, frost-proof place

Plant Jerusalem artichokes in an unwanted corner

Sow broad beans for early crop

Bend the leaves of flowering broccoli inwards, to protect them from frost

Give the cabbage patch a dressing of lime

Sow short horn carrots for an early crop on a warm border

Sow onions for spring thinnings

Plant seakale and rhubarb; also shallots and onion sets

Food in Season

Fish

Barbel; bream; brill; carp; cod; dory; eels; flounders; gurnet; haddock; hake; halibut; herring; ling; mackerel; mullet (red); perch; pike; plaice; salmon; skate; smelts; soles; sprats; tench; turbot; whitebait; whiting

Shellfish

Crab; crayfish; lobster; mussels; oysters; prawns; scallops; shrimps

Meat

Beef; house lamb; mutton; pork; veal; venison

Poultry and Game

Capons; capercailzie; chicken; duck; fowl; geese; hares; larks; landrails; partridges; pheasants; pigeons; pintail; plover; ptarmigan; pullets; prairie-hen; quails; rabbit; snipe; teal; turkey; wild fowl; widgeon; woodcock

Vegetables

Artichoke; beetroot; broccoli; Brussels sprouts; cabbage; cardoons; carrots; celeriac; celery; chervil; chicory; cress; cucumber; endive; horse-radish; leeks; lettuce; mushrooms; onions; parsnips; potatoes; radishes; salsify; savoys; Scotch kale; seakale; spinach; tomatoes; turnips; turnip tops

Fruit

Almonds; apples; bananas; Brazil nuts; chestnuts; cob nuts; cranberries; grapes; lemons; limes; medlars; oranges; foreign peaches; pears; pine-apple; rhubarb; walnuts

Notes for the Month

FEBRUARY 8 .. Half-quarter Day
FEBRUARY 14 .. S. Valentine's Day

fingering, is pure and brilliant, except in the extreme notes. On the whole, however, the scale is fairly even.

After using, the instrument must be thoroughly wiped inside and out, especially near the joints where moisture is apt to collect, and, if not removed, to cause inevitable mischief. An oily rag passed through it now and again will help to keep it in good order, especially in hot weather, and all springs and moving parts should be periodically cleaned and made to work freely, oiling if necessary, but with a very sparing hand. Should the holes become dirty, cleanse them with a soft rag or brush, but never use anything which may in time enlarge the holes, or faulty intonation will be the result. The flute in its case should be kept in a dry but not too warm a place.

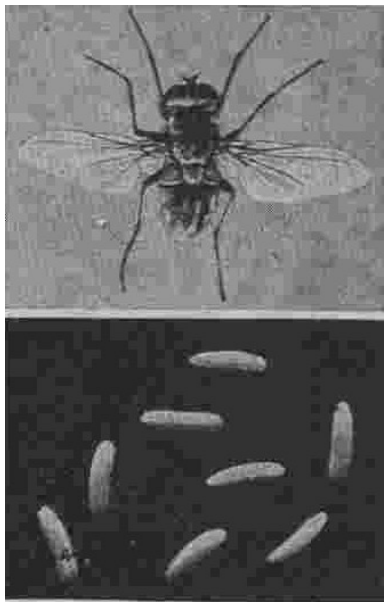
FLUTING. As applied to work done on wood, stone and on silver and similar metals, fluting is the regular semi-cylindrical ornament with which many pieces are decorated. Examples are often found on the pillars of candle-sticks and the bases of teapots, and in stone, plaster or wooden pilasters and pillars. In small woodwork, fluting can be obtained by the use of a reeding plane, or hand beader, an implement in the form of a spokeshave; when applied to plaster work or cement construction it may be either moulded or run in with a templet or horse.

FLUX: In Metal Work. Fluxes are used in uniting metals during welding, brazing, and soldering, to prevent oxidation, to clean the surfaces, and ensure a sound joint. A flux in common use is zinc chloride, otherwise known as killed spirits, when it has been prepared for use by dissolving in hydrochloric acid as much zinc in the form of odd little pieces or cuttings as the acid can attack. Rosin and sal-ammoniac are other useful fluxes.

Fluxes for brass and copper include ammonium chloride, rosin, zinc chloride. Tallow or rosin are good fluxes for lead. Zinc is soldered with hydrochloric acid as the flux, and the same acid may be used as a flux on galvanized steel. Chloride of ammonia is a good flux for soldering steel and wrought iron. The soldering of aluminium presents some little difficulty, as the fluxes mentioned are ineffective. Various proprietary solders are sold for the purpose. In addition to the fluxes enumerated there are several preparations on the market, including one, in the form of a paste, that combines the properties of a flux and a solder.

The flux commonly used for silver soldering is borax, prepared by rubbing a lump on a clean piece of slate, slightly moistened with water; the creamy paste so produced is then applied to the parts to be jointed, and is an efficient flux for small work. Borax may be applied in powder form, and in some cases mixed with small pieces of solder. The same flux is in extensive use for all classes of brass brazing where spelter, or brazing wire, is employed. *See* Brazing; Soldering; Welding.

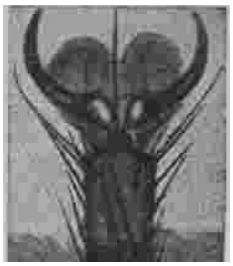
FLY: The House Pest. The fact that flies are active agents in spreading infectious diseases is now generally recognized. In a count made of the microbes on the bodies and legs of a number of house-flies the average was found to be over a million. The diseases of which flies are the most active carriers include typhoid fever, dysentery, tuberculosis, cholera, and the epidemic diarrhoea from which large numbers of children die in summer and early autumn.



Fly. Left, adult house fly. Below, eggs. Both considerably enlarged.

Flies lay enormous numbers of eggs, and in hot weather female flies developed from the eggs may themselves be laying eggs within so short a period as three weeks. The eggs are laid in manure, human excreta, garbage, etc.

War on the house-fly should be carried out relentlessly by every prudent householder.



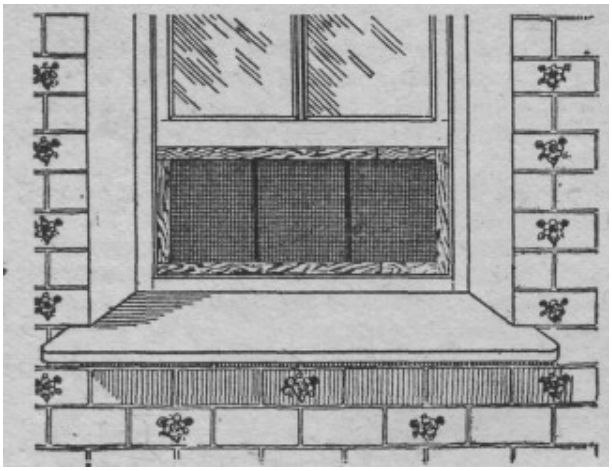
Foot of house-fly.

The most necessary measures are to remove manure and garbage heaps to a distance from the house, to keep dust-bins constantly covered and to burn all vegetable and other food waste. The dust-bin should be thoroughly washed from time to time, and then dried before using it again. In hot weather it should be disinfected once a week with some dry disinfectant. Manure or garbage heaps should be sprinkled with chloride of lime.

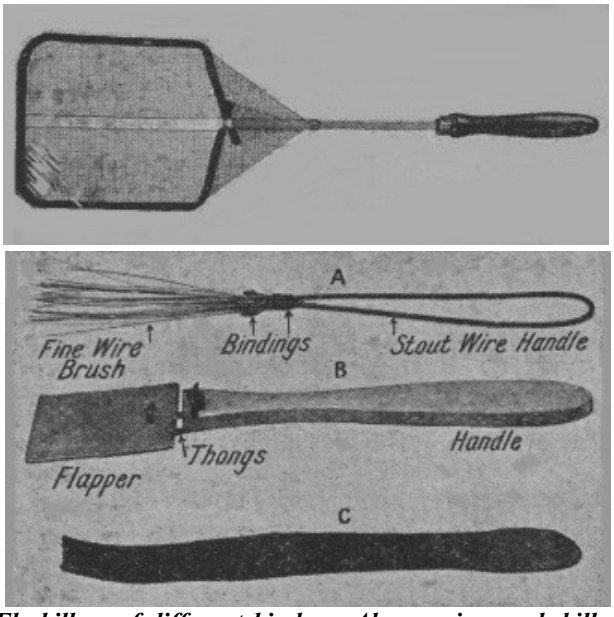
In the larder all food must be kept in a ventilated safe or covered with gauze. Food which must be exposed on the table or elsewhere should be protected by wire or muslin covers. Care must be taken to keep the baby's milk free from contamination.

If a dead fly is found in the milk, the milk should not be given to the baby. Fly-papers should be placed about the larder, kitchen, and dining room, and other parts of the house if necessary. One device for keeping flies away is a fly screen of the type illustrated. This is an adjustable screen of fine wire mesh, fixed on a wooden frame, and its purpose is to prevent flies from entering through an open window. In this way a free current of air can enter the room, but flies cannot get through the wire.

Fly Papers and Repellents. A fly paper can be made by coating pieces of paper with a mixture of powdered resin and colza oil, in the proportion of three parts of the resin to one of colza. It will suffice if the resin is melted over a slow fire, and the colza stirred into it to form a sticky substance, which is then applied while hot to the paper.



Fly. Effective screen made from fine wire mesh fitted into a frame and inserted below the raised sash of a window.



Fly killers of different kinds. Above, wire mesh killer. Below, A, made of wire; B, of wood; C, of leather. (Courtesy of A. W. Gamage, Ltd.)

A somewhat different system is to repel the flies by the use of blotting paper soaked in equal quantities of oil of pennyroyal and eucalyptus oil, the pieces being placed on the window sill or any place where the flies are likely to enter. Another method is to soak a sponge or some crumpled blotting paper in hot water, and pour a little oil of lavender upon it.

An effective method of catching flies is to cover the top of a jam jar with a twisted piece of paper in the form of a cone, with the smaller end downwards. The flies will easily find their way in, but cannot escape, as they seem unable to get through the small end of the cone from the inside of the jar.

Another simple form of fly trap can be made by smearing the inside of a plate, a saucer, or a small ornament with a mixture containing pepper, and inverting it over two sticks or pieces of wood, leaving just room enough for the flies to crawl in underneath. An effective mixture for this purpose is composed of ½ teaspoonful of ground black pepper with a little brown sugar and either cream or margarine, a little water, being used to dissolve the sugar and make a paste. Quassia chips are also employed, and a recipe for them is to boil ¼ oz. of quassia chips for 10 min. in about a pint of water and add 4 oz. of treacle or syrup. The trap should be cleaned and reset every morning, the result fully justifying the trouble taken.



Fly. Attracted by bait, flies enter the inner cone of the trap from beneath the overhanging metal band at base, afterwards emerging through a hole at the top of the cone into the fine wire mesh globe. (Courtesy of A. W. Gamage, Ltd.)

Beer is frequently used in fly-traps. A recipe of this kind contains a tablespoonful of beer, 2 drams of formaldehyde, and a tablespoonful of sugar, the mixture being put into saucers with some small pieces of bread dipped in for the flies to settle on. Formalin is generally effective for the same purpose, a teaspoonful being added to a little milk in a saucer.

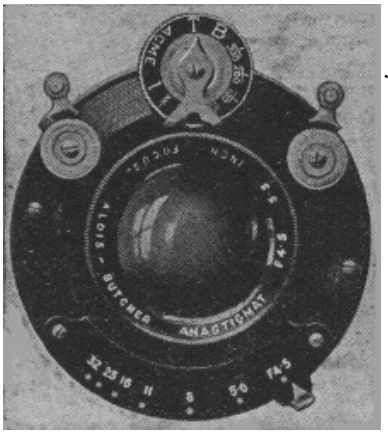
A useful instrument for killing flies comprises a straight handle, on which is fitted a flap made either of wire or leather. It is used by striking at the insects with the flap, which is more or less hinged. Several types are shown in the illustrations. The construction can be carried out in wire or wood. A short piece of leather

strap shaped somewhat in the form of a handle at one end, and as a brush-like shape at the other, can be of great service. *See* Blow-fly.

FLY POWDER. This term is generally applied to a powder for sprinkling upon sheep to prevent flies striking the skin. It is also applied to powdered borax or powdered hellebore, which are employed for destroying the larvae of the house-fly by sprinkling upon manure heaps. Hellebore is poisonous, but borax is harmless to human beings and domestic animals.

FLY-TRAP: The Plant. This plant, Dionaea muscipula, has fleshy, circular leaves, at the edges of which are hairs. By the sides of the centre rib are bristles or springs. When these springs are touched by the weight of a fly alighting upon them, the two sections of the leaves close up, the exit is sealed by the hairs at the edges of the leaves interlocking. These carnivorous plants are grown in a heated greenhouse. They flourish best in a wet, peaty soil. *See* Venus Fly Trap.

F/NUMBER: Of Lenses. The f/numbers engraved on the lens mount of a camera refer to the size of the aperture of the lens, the lowest figure being the full aperture when the diaphragm is fully open. They govern the speed at which the lens works, and consequently the length of the exposure. A fast and expensive lens will work at f/4.5, f/3, f/2, or even lower, while the lenses on the cheaper snapshot roll filmcameras generally work at f/8 or f/11. The f/number of a lens represents the number of times that its diameter is contained in its focal length; thus, if the focal length of a lens is 6 in. and its diameter is ¾ in., the latter divided into the former gives 8, which is the f/number.



F/Number. Lens front of a hand camera with usual series of f/numbers marked at bottom.

The more the diaphragm or stop of a lens is closed and therefore the higher the f/number, the greater the sharpness of detail in the picture, both in foreground and distance. This is called increasing the depth of focus, as explained under the heading Focus. The speed of the lens is directly indicated by its f/number at full aperture, one working at f/4.5 requiring only a fraction more than a quarter of the length of exposure required by a lens working at f/8; that is, the second lens, which is one often found on film cameras, requires an exposure 4 times longer than the first lens to give a good negative.

The usual series of f/numbers or stops is in the sequence 5.6, 8, 11.3, 16, 22.6, 32, each of which requires an exposure twice that of the stop immediately preceding it. For instance, if the exposure time for f/8 is known and it is necessary to stop down to f/11, the time of exposure is doubled; if f/16 is used it is multiplied 4 times. These are the numbers usually marked on lenses, but there is also another system, called the Uniform System, or U.S. stops. Some foreign-made lenses have numbers marked on them which are not the ordinary series, such as 6.3, 9, 12.6.

In general, the rule for the calculation of exposure for any unusual f/numbers is that the time of exposure for the lowest number having been found, exposures for the other numbers in a particular series are proportional to their squares. To do this, take the square of each of the numbers on the lens mount, and then, taking the lowest as the unit, make a table showing the proportions of each of the other squared numbers to it. *See* Focus; Lens; Stop.

FOAM FLOWER. The botanical name of this hardy plant is Tiarella cordifolia. It is hardy, 10 to 12 inches high, and bears white flowers in April. It is easily grown in soil with which sand and leaf-mould have been mixed and is suitable for the rock garden or shady border. It is propagated by seeds sown in a frame in spring.

FOCAL PLANE SHUTTER. A form of shutter used in cameras, particularly reflex and press cameras, for objects moving at high speed. It consists essentially of a blind wound on spring rollers and having transverse slits of different widths. It passes up and down immediately in front of the plate, i.e. it is at the point or plane at which the lens throws an image sharply in focus, hence the name.

The blind is arranged to work at various speeds by increasing or decreasing the tension on the spring in the roller. By varying the tension and the width of the slit used, a great variety of times of exposure may be obtained, exposures as short as 1/1250th of a second being possible.

A certain amount of practice is required for the successful use of a camera with a focal plane shutter, when snapshotting fast-moving objects, as, for instance, a cricket ball leaving a bowler's hand, or a football entering the goal. When looking at the screen of a reflex camera the tendency is always to make the exposure a fraction of a second too late, inasmuch as there is an appreciable time between the release of the mirror and the actual exposure. It is therefore necessary to anticipate very slightly the action to be snapped, and if the camera is properly focussed beforehand, it is best to watch the subject directly. A quick eye and a sure hand are essential; fast plates are best. *See* Camera.

FOCUS: In the Camera. Points to be considered with a camera lens are its focus, or focal length, and its depth of focus. The focus of a lens is that point at

which, when the camera front is racked out, a clear image, sharp in detail, of the object being photographed is thrown on to the ground glass focussing screen or the plate. In the case of a simple lens, or a simple double lens (not an anastigmat), this point is roughly measured in the following way. The lens is racked out until clouds, or some far-distant object, are seen sharply on the focussing screen. The distance then found between the ground glass screen and the front surface of the lens, in the case of a single lens, and midway between the two lenses in the case of a doublet, gives roughly the focus, or focal length of the lens.

For various purposes very different focal lengths are required. In the cheap folding camera a very short focus lens is generally used, which has a wide angle, and covers a large field of view, giving a picture with relatively small detail. The other extreme is seen in the telephoto lens, which has a very long focus with a particularly narrow angle. It covers a small field of view, but gives objects on the plate in relatively large scale. For ordinary purposes the amateur is best served by a medium long focus lens. Photographs taken with a long focus lens have a more natural appearance than those taken with a short one. For a camera of ¼ -plate size a lens of about 6 to 7 in. focus will give satisfactory results; a 5 in. or shorter lens will give the wide angle effect referred to.

The length of focus of an anastigmatic lens cannot be measured in the fashion described above for simple lenses, because difficult optical questions arise.

The depth of focus varies with the class of work which the lens is designed to carry out, and according to its aperture as indicated by its f/number. By depth of focus is meant the distance at which all objects in the field of view are seen sharply in focus on a ground glass screen. Thus with a short focus, small aperture lens working at f/11, practically everything from a point about 4 ft. away from the camera to infinity, or the farthest distance, will be rendered on the film with pin-point sharpness. Such a lens is said to have maximum depth of focus.

This is by no means an advantage, as in landscape photographs it destroys all sense of distance, and in portraits gives unpleasing results, making the background, for instance, as prominent as the sitter. With a long focus wide aperture lens, working at about f/4.5, the sharpness of focus quickly falls off, and more distant detail is greatly softened. When the maximum depth of focus is required with such a wide aperture lens, it is obtained by the simple process of stopping it down to f/11 or more.

In cheaper cameras lenses are sometimes described as being of fixed focus. This simply means that the distance between the lens and the film cannot be varied, and when the camera is opened it will be always in focus.

Errors in Focussing. Many photographs are spoilt by being out of focus through inaccurate judging of distance, particularly in the case of more or less hasty snapshots. The only remedy is practice. This is easily obtained if a camera with a focussing screen can be acquired, or a temporary screen of ground glass fitted to the back of a film camera in place of the film holder, care being taken to see that the ground glass is at the same distance from the lens as the surface of the film. It is necessary to see not only that the principal object is in sharp focus, but that the range of sharpness is properly distributed. A photograph will be quite spoilt if, while the principal object is sharply in focus, the foreground is fuzzy.

If it is found that photographs are obtained which are out of focus in spite of careful esti-mation, it is well to look to the focussing scale as a possible source of the failure. Photograph an object at an accurately measured distance with two or three others at short distances in front and behind it; a print will show the amount of error in the scale, this process being repeated for one or two other distances, and the scale corrected as necessary. Errors in focussing are often due to careless adjustment of the moving pointer; the pointer should be viewed from immediately above and not from the side.

Range-finding. The modern miniature camera of the more expensive type usually includes a range-finder which is coupled to the lens so that the precision in focussing which the small negatives require is made simple. Range-finders are also fitted to some of the more expensive roll-film cameras. The reflex camera affords a ready means of focussing the object direct on to a ground glass screen and in its modern form is available in many sizes from the 35mm. miniature type to the 120 roll-film. Focussing may be further assisted by the provision of a special magnifying lens above the screen. *See* Camera Enlarging; F/Number; Lens; Photography.

FOIE GRAS. This is the French term for the fat liver of the goose. Made up into pate de foie gras, it is regarded as a great delicacy. *See* Paté de Foie Gras.

FOIL: In Architecture. This term is used in ornamental tracery to denote one of several almost circular lobes tangent to the inner side of an arc, and meeting each other at points called cusps. *See* Trefoil.

FOLDING TABLE. The structural necessities of a folding table are that it shall be perfectly rigid when open, and fold away into the smallest possible compass when not required for use; if possible it should also have no loose parts to get lost, but this is not always practical. In Fig. 1, the only loose part is the centre bar running through and between the diagonal rails. To put the table away, the top is taken off and the loose bar withdrawn; this leaves the framework free to fold up, the top folding either inward or outward, and the lower part automatically folding in the opposite direction, forming a quite flat arrangement. The two ends are made first. These consist each of two 1½ in. legs with 1 in. cross rails screwed to them, as in Fig. 3;

at the top is screwed another rail, which equals in width the thickness of the leg and the cross rail together. The diagonal rails are rounded at the ends so as to clear the side rails when being folded. They are secured to the legs by nuts and bolts, with a washer between. It will be noticed that the rails are fixed to the inside of the legs except at one of the corners, in this case at the bottom right corner (Fig. 2); this is necessary to allow them to clear themselves.

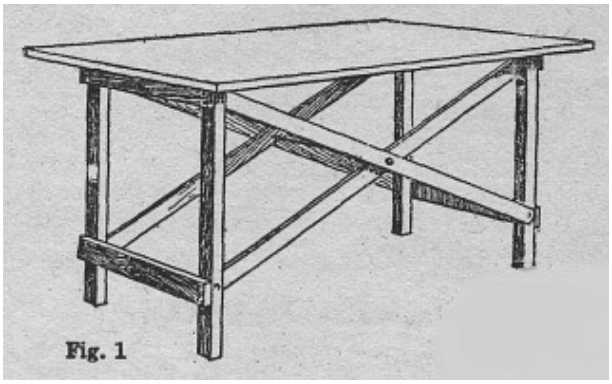


Fig. 1

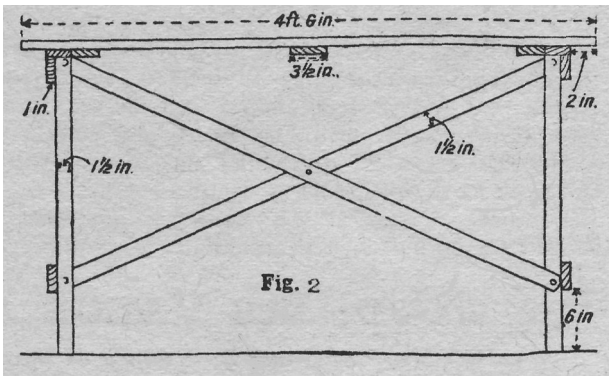


Fig. 2

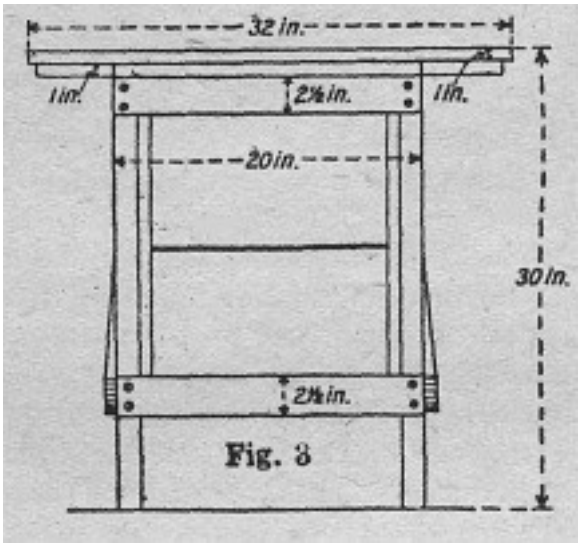


Fig. 3

Folding Table. Fig. 1. Table standing rigid; when not in use the top is removed, the central loose rail withdrawn, and the framework folded upon itself. Figs. 2-4. Details of construction.

When the whole frame has been assembled, the hole for the centre bar is bored; this may be a narrow brass rod with a knob screwed on at each end. The top is of 1 in. stuff glued up to width and strengthened with battens slot-screwed to the under side; three will be sufficient for a 4 ft. 6 in. table. To keep it rigid and in position four small buttons are screwed to the cross battens, as in Fig. 4, these being simply turned to release the top. Allow the top to project to the extent shown.

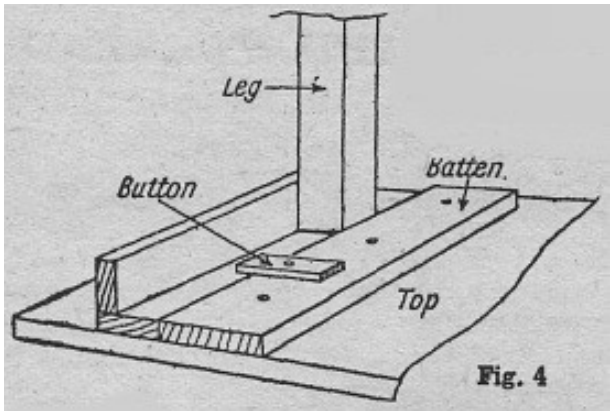


Fig. 4

Folding Occasional Table. A small table very useful for occasional use and folding into a still smaller space is depicted in Fig. 5. The top hinges over, the legs folding across each other from the centre (Fig. 6). The legs are cut off 2 ft. 4 in., 1 in. being allowed for the top, turned according to the pattern, and then mortised to take the rails. It should be noticed that the gates fit one inside the other, so that the rails of the one will be closer together to the extent of the width of the two rails. Fig 7 shows the table open, and the position of the rails of the movable gate are shown in section in the centre leg. Having glued them together, the gates may be fixed at the centres with dowels.

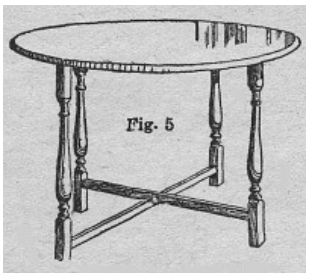


Fig. 5

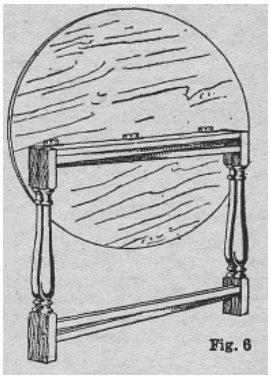


Fig. 6

Folding Table. Fig. 5. Circular gate-leg table. Fig. 6. Top hinged over and legs folding across each other.

Fig. 7. Side view, showing by dotted lines in centre leg the position of rails of movable gate.

Fig. 8. Table top, showing two stops to limit extent to which table opens.

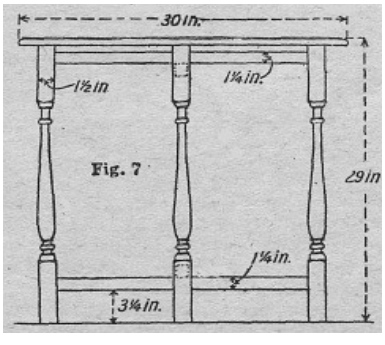


Fig. 7

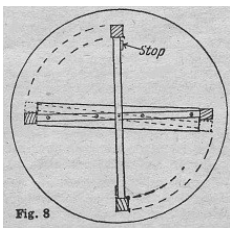


Fig. 8

A 1 in. top piece is now screwed to the one gate, as in Fig. 8, being slightly wider than the two gates when folded, and occupying in length just the space between the projection of the legs at the top. To this piece the main top is hinged with three hinges. The whole job should now be opened till the gates are at a right angle and two stops fixed to the top as in Fig. 8, this being the extent to which the table should open. The contours of the turnings are most suitable for oak, but apart from this the table can be made in any wood. *See* Gate-leg Table; Table.

FOMENTATION: How to Apply. A fomentation consists of a piece of flannel or other absorbent material wrung out of boiling water. It is a very convenient method of applying moist heat, produces the same effects as a hot poultice, and is more easy to renew as it becomes cool. Fomentations relieve tension, pain, and spasm. They form valuable measures in intestinal colic and the intense pain attending the passage of a stone from the kidney to the bladder, or of a gall-stone. A hot fomentation may give much relief from the pain due to a sprain. Applied to a bruise, it not only gives relief, but diminishes the subsequent discoloration.

Place a thick roller towel over a deep basin and pass a stick through each end. In the centre of the towel lay a piece of coarse flannel or a piece of blanket, folded into two or more thicknesses. Pour the boiling water over the flannel, and let it soak for a few seconds. Then twist the sticks in opposite directions, so as to wring all the water out of the flannel. The fomentation must be wrung as dry as possible and shaken out lightly. Apply it quickly to the painful part and cover it with a piece of jaconet or thin mackintosh. This should overlap the flannel by 1 in. or more all round, otherwise the fomentation will cool too quickly. Over all place a sheet of thick cotton wool. Bandage to prevent displacement. When the object is the relief of pain it should be changed every 20 min. The skin should be dried before applying the fresh fomentation.

A turpentine fomentation used to produce counter-irritation, as in lumbago, is made by adding 1 or 2 teaspoonfuls of oil of turpentine to a pint of boiling water, and applying as before; or the turpentine may be sprinkled on the fomentation just before it is applied. In cellulitis, whitlow, or any other acute suppurative condition, a fomentation prepared by adding one teaspoonful of glycerin of boracic acid to a pint of boiling water often gives great relief. *See* Bandage; Poultice.

FONDANT. Largely used in the making of confectionery, the fondant forms the basis of many different kinds of sweets. To make it, melt 4 lb. of granulated or loaf sugar in about ¾ pint of cold water placed in a saucepan over a low fire. Stir the syrup gently until the sugar is completely dissolved; then pour in 2 tablespoonfuls of liquid glucose. Cover the pan, and boil its contents rapidly for a few minutes, removing any scum. Let the syrup boil to 240° F., continue skimming without stirring, and brush the sides of the pan occasionally with cold water. This will prevent the fondant from becoming granulated.

When 240° has been reached, pour the whole on to a marble slab, which has been rinsed with cold water, sprinkle a little water on top of the fondant, and allow the latter to cool slightly before working it with a wooden spoon. When it has cooled sufficiently, it may be kneaded with the hands until it is white and smooth, and then flavoured and coloured to taste. Store it in an airtight box.

Fondant required for coating purposes should be boiled to a temperature 5° higher.

It should be kneaded and stored in the same way, and when required for use placed in a saucepan, together with a little sugar syrup, colouring and flavouring, and melted over a low fire The fondant should be beaten all the time with a wooden spoon, and must not be overheated. Occasionally it should be removed from the fire and beaten vigorously. Enough sugar syrup is added to make the fondant of a thick, cream-like consistency. When lukewarm, the centres for sweets or small cakes which are to be coated are dipped into it and left to dry.

The sugar syrup is prepared by dissolving 1½ lb. of granulated sugar in 1 pint of water, then bringing it to the boil and boiling it for 5 min. in a covered pan. The lid is removed and boiling continued for 25 min This syrup may be bottled when not required for immediate use. Fondants may be crystallized by leaving them to stand in cold crystallizing syrup for about 9 hours, and then drying them upon trays.

Fondant Icing. A quick fondant icing can be made by mixing in a pan ½ a gill of cold water, the juice of ½ a lemon and 1 lb. of icing sugar. Warm until a creamy liquid is formed and pour over the cake as required. *See* Cake; Chocolate; Sweets.

FOOD: ITS VALUE AND PRESERVATION

A General Survey of this Vital Domestic Subject

This article may well serve as an introduction to those on the various items of food and drink that are found in this work, e.g. Bacon; Beef; Bread; Butter; Cake; Cheese; Fish; Fruit; Jam; Mutton; Pork, etc. See also Breakfast; Diet; Digestion; Dinner.

The principles regulating the proper rationing of food are discussed under the heading Diet. The claims of the palate must give way to soundness in dieting, and difficulty, on the score of expense, in providing a proper diet can be overcome quite well by a judicious choice of food-stuffs, as many of the cheap foods are intrinsically as valuable as the more expensive. Skilful cookery can do much to give attractiveness to food-stuffs which are not in themselves very inviting, and this is perhaps the most important factor in solving the dietetic problems of households with very limited resources.

Meat may be (1) home-fed and killed; (2) fed abroad

but killed at home; (3) refrigerated, or chilled; or (4) frozen; the last is generally mutton. The second class is that of prime animals but has probably lost fat during the voyage. The third class can be recognized by its pink fat and by the outside of the meat lacking the lustre of fresh meat. The fourth class, if unthawed, will be stiff, and, if thawed, the outside will have a faded or perhaps even a parboiled appearance, while fluid will drip or ooze from the meat, which has not the mottled appearance of fresh meat; the fat has a dull, white colour.

It should be understood, however, that chilled and frozen meat are quite as nutritious as fresh meat, and that the inferior cuts of any meat are from this point of view quite as good as the better. As regards digestibility, mutton is more digestible than beef, and beef than veal. Pork, because of its large content of fat, is difficult to digest. Tripe and sweetbreads are easily digested.

Rabbits are in season from September to February; a young animal is distinguished by its smooth, sharp claws and soft ears. The meat is easily digested. Game derives its flavour by being hung for from five to ten days, until, in fact, decomposition has begun; this, however, has no ill consequences because the meat is dry.

In choosing a fowl an old one will be recognized by its stiff, horny feet, long spurs and dark-coloured thighs. The skin of a fowl should not be discoloured and the flesh should be firm. The meat of duck or grouse contains a considerable amount of fat and is correspondingly harder to digest. The breast of a chicken is the most easily digested kind of meat.

Only fresh fish should be accepted. A fresh fish is stiff, the eyes are prominent and bright and the gills are bright red. Salmon and eel contain a considerable proportion of fat, and so require good digestive powers. Owing to their cheapness, herring are one of the most valuable foods. Oysters, if raw, are very easily digested. Crab and lobster are difficult to digest.

The qualities of bread are discussed under its own heading. Macaroni and vermicelli are preparations of wheat flour and are rich in gluten. Barley has a composition like that of wheat, but it does not form gluten. It is a good food, though barley cakes are less palatable than, and not as easily digested as, bread. To make pearl barley, the grains are deprived of the husk, rounded and polished. Barley meal consists of the whole grain ground; in Scotch, mulled or pot barley, the grains are husked and roughly ground; patent barley is merely flour formed from pearl barley. Rye makes a dark, somewhat heavy and acid loaf, not so easily digested as wheat bread.

Oatmeal contains relatively large amounts of protein and fat and, apart from greater difficulty of digestion, is a better food than white bread. It might with advantage form a part of every dietary. Maize resembles oats in composition but is rather harsh in flavour. From it cornflour and hominy are prepared. Rice is deficient in protein, fat and salts, and therefore is mainly a starchy food. Polishing the rice deprives it of vitamin.

Food-stuff	Grammes per ounce			Calories per ounce
	Protein	Carbohydrate	Fat	
Milk, fresh, average	1-0	1-5	1-0	20
Butter	0	0	25-0	225
Cheese, Cheddar	12-6	0	6-8	115
„ American	9-6	0	9-3	126
„ Stilton	6-9	0-6	10-6	130
„ Cream	5-2	0	7-0	86
„ Camembert	5-3	0-9	6-0	80
„ Skim milk	9-2	1-9	2-4	69
Margarine	0-2	0	23-2	216
Eggs	3-0	0	3-0	40
Beef, fresh, lean	6-0	0	3-0	51
„ corned	6-6	0	4-0	64
Veal, loin	5-6	0	2-8	49
Mutton, shoulder	4-1	0	5-5	68
Lamb, „	5-2	0	4-7	65
Pork, fresh side	2-5	0	14-9	149
Mackerel	5-3	0	2-0	40
Salmon	6-2	0	3-6	59
Whiting	4-8	0	0	20
Flour, family grade	2-3	20-8	0-3	88
Bread, white	2-0	14-5	0-4	76
„ brown	1-4	13-0	0-4	63
Biscuit	4-4	20-8	0-3	106
Oatmeal	4-6	18-0	2-0	111
Rice	2-0	22-5	0-1	101
Peas fresh	1-5	4-7	0-1	26
„ dried	4-9	17-8	0-2	95
Jam or marmalade	0	16-6	0	68
Sugar, refined	0	28-3	0	116
Vegetables, fruit, raw A	0-5	1-0	0	6
„ „ „ B	0-4	2-0	0	10
„ „ „ C	0-3	3-0	0	14
„ „ „ D	0-l	4-0	0	17
„ „ „ E	0-3	6-0	0	26

Constituents of some common articles of food

Arrowroot, tapioca and sago consist of starch simply. There are various kinds of arrowroot on the market, Bermudan arrowroot being the best. Tapioca is got from cassava root, sago from the sago palm. When these are used as milk puddings, protein and fat are supplied by the milk. The pulses, namely peas, beans and lentils, are rich in protein, but peas and beans are rather difficult of digestion and much of the protein is not assimilated.

Potatoes contain a large proportion of starch with a little protein. Experimentally, vigorous health has been maintained on a diet of potatoes and vegetable margarine with a flavouring of onion. But the water in which the

potatoes were boiled was also taken, the potatoes being very thinly peeled before cooking. The water contains valuable salts and vitamins taken out of the potatoes. The loss of these salts can be prevented, or lessened, by boiling potatoes in their skins.

For convenience vegetables and fruits are grouped in five classes according to their content of carbohydrate, which is their principal constituent as regards caloric value. Their vitamins, salts and acids are of great importance, in many cases of most importance. The carbohydrate content of each group is shown in the table of foods given below. The vegetable and fruit groups are as follows: A. Cabbage, lettuce, cauliflower, sprouts, spinach, tomatoes, watercress and radishes. B. French beans, onions, carrots, turnips and beets. C. Strawberries, gooseberries, oranges, peaches, pineapples and melons. D. Pears, apples, currants, raspberries, cherries, apricots, peas, parsnips and artichokes. E. Bananas, plums, prunes and potatoes.

By reference to the table on previous page and to the particulars given under the heading Diet as to the relative proportions of proteins, carbohydrates and fats in a diet, and the number of calories needed by various people, it should be possible to construct correct dietaries. These can be varied very largely to suit the family purse.

Storage and Preservation. In the storage of food cleanliness and coolness are essential. On no account should milk, fish, meat or similar food-stuffs be kept on the floor of the larder, and they should always be covered or screened to protect them from dust and from the visits of flies. A gauze screen is not sufficient protection against the blue-bottle, as the female deposits her eggs on the gauze and they drop down on to the meat; a piece of muslin should be placed over the meat or on the top of the gauze cover. Weighted gauze covers should be put over jugs or other receptacles containing milk, jam, etc. It is advisable that root and green vegetables should be stored separately. Coolness may be secured by free ventilation of the larder through a gauze-screened window; by having a moistened canvas cover over a food container; by placing ice on fish, meat, etc., or by placing food in an ice-chest.

Much of the food used nowadays is canned or bottled, and a considerable amount of bottling is done in the home. To make such food keep it is subjected to heat in the tin, in the lid of which an opening is left to allow the escape of vapour. This opening is then soldered up, and the contraction which occurs when the tin and its contents cool usually causes the ends of the tin to bulge inwards.

If the end of a tin bulges outwards it should be rejected, as the bulging is due to gases formed by putrefaction. Such a tin is said to be blown.

Unscrupulous traders may perforate the tin, allowing the escape of the gases, then reheat and reseal. The presence of two soldered openings should therefore be viewed with suspicion. Bottled fruit and vegetables are treated similarly. Jam is usually covered after it is cold, and the surface may be sprinkled with some chemical preservative; indeed, something of this kind may be found in any kind of preserved food.

When a tin has been opened the food should be used at once; it is dangerous to allow it to stand in the tin or even, having once heated the food emptied from the tin, to allow it to stand.

The use of chemical preservatives for food can hardly be dispensed with, as so much food is imported, and both this and home-produced food require to be stored, sometimes for considerable periods. Some chemicals used for preserving are harmful if taken in the amounts which might well be ingested in the course of ordinary diets containing a fair proportion of preserved food. Boracic acid is an example.

The Public Health (Preservatives, etc., in Food) Regulations, 1925, prescribe the articles which may contain chemical preservatives and the appropriate preservative and amount of it for each. The only preservatives allowed are sulphur dioxide and benzoic acid.

Poisoning by Food. Food poisoning may be due to metallic poisons, copper, tin, or lead, from containers or cooking utensils, but is relatively infrequent. Strict care, however, is necessary to keep such utensils clean and not to allow foods containing acids, fatty or otherwise, to remain long in a copper utensil. Defects in the lining of a tin may cause chemical contamination of food.

Most cases of food poisoning are due to the activities of what are called the salmonella group of bacilli, for example, bacillus aertrycke and bacillus enteritidis. The symptoms may be caused by the poisons produced by the bacilli, poisons which remain active even if the food is raised above the boiling point of water; or by the living bacilli themselves.

There is vomiting, diarrhoea, abdominal pain, cramps in the limbs and some fever. Vomiting and diarrhoea are usually sufficiently severe to clear the bowel, but it will be useful to aid cleansing of the stomach by giving large draughts of tepid water and, if the bowels are not acting freely, a dose of salts or of castor oil. The patient must be kept lying down and be kept warm; stimulants also may be needed. Pain and cramps should be treated by hot applications.

Another kind of bacterial food poisoning is known as botulism (q.v.).

Formerly much importance was attributed to ptomaines, alkaloidal products of putrefactive organisms, but it is now clear that such poisons are destroyed in the stomach and are extremely unlikely to give rise to symptoms.

It must be borne in mind that food capable of causing poisoning is rarely offensive or in fact noticeably altered in any way.

FOOL. This is a popular variety of English sweet. The name is taken from the French word fouler, meaning to crush or bruise, and is given to stewed or crushed fruit mixed with cream or custard, and sugar. *See* Gooseberry; Rhubarb; Strawberry.

FOOLSCAP. This word is used for paper of a size frequently used for writing, though too large for correspondence, and for drawing. A sheet of it measures 17 in. by 13½ in. A sheet of double foolscap measures 27 in. by 17 in. *See* Drawing.

FOOL'S PARSLEY. Also known as the lesser hemlock, the botanical name of this plant is Aethusa cynapium. The leaves have been eaten in mistake for parsley, though, as they give off a nauseous odour when rubbed together, such a mistake should not occur. It is said that the roots have been eaten in mistake for young turnips. The drug has narcotic properties, and possibly poisoning may occur from eating it. The treatment is to empty the stomach by an emetic such as a tablespoonful of mustard in half a glass of water. Give a dose of castor oil, and then draughts of strong, hot tea, and keep the patient warm. *See* Poisoning.

FOOT. The bones of the foot compose three groups: the tarsus, comprising seven bones, which form the heel and instep; the meta-tarsal bones, five in number, on the fore part of the foot; and the phalanges, of which there are two in the great toe and three in each of the others. The inner border of the great toe is in line with the inner border of the heel, and the axis of the foot is a line from the centre of the heel through the mid point of the end of the great toe.

A number of deformities of the foot are caused by wearing badly-shaped boots, the usual fault being too pointed toes; but sometimes, and perhaps in addition to the first, the boots are too short. The toes tend to be crowded together, the great toe being displaced outwards (hallux valgus), and perhaps one or more of the other toes actually overriding the others. Hallux valgus is likely to be accompanied by a bunion on the inner side of the joint connecting the great toe with the foot, and this joint may be inflamed and enlarged.

A short boot or one with a too high heel may give rise to hammer toes, a condition in which the toe is bent upward at its junction with the foot and bent sharply towards the sole at the joint in front of this. One or all of the smaller toes may be affected. Corns form readily on these toes, and form on the toes apart from deformities when the boots are too tight. Soft corns between the toes are due to the latter being crowded together and to the spaces between not being kept clean and dry. It is obvious that the first thing in the treatment of all these conditions is to have properly fitted boots.

There are two arches in the foot, one from before backward and the other from side to side. The maintenance of the former is largely due to the long plantar ligament, the action of which resembles that of a bow-string. When the arch sinks down in flat foot (q.v.), this ligament and other structures which assist its action are stretched.

The foot is liable to several varieties of deformity besides flat foot, for example, claw foot and club foot and drop foot. Trench foot is a condition resembling frostbite, occurring in those who have to remain for long periods with wet and cold feet, without the opportunity to remove their boots frequently.

Ingrowing Toe Nails. The toe nails need a good deal of attention in order to keep them in good condition. Both in the case of cliildren and of adults they should be cut regularly.

Some persons suffer from an ingrowing toe nail, a very painful condition. It is often caused by a badly fitting boot or one with a very narrow toe. The best preventive is to wear square-cut boots, raised or blocked at the toes. Cut the nails straight across, never cutting the outer edges, as this only encourages the sides to grow deeper into the skin.

To cure an ingrowing toe nail, insert a small pledget of cotton wool sprinkled with boracic acid under the ingrowing part. The pledget should be renewed every morning and the toe anointed with boric ointment every night.

Care of the Feet. If the feet get very quickly tired, and the ankles are weak, one of the best remedies is to bathe the feet night and morning in warm water to which has been added a tablespoonful of brown vinegar or a handful of Tidman's sea salt. The feet must then be dried and well rubbed with methylated spirit or toilet vinegar.

In cases of excessive perspiration the feet should be bathed three times a day at least, and directly after exercise, in warm water to which a little disinfectant lotion has been added. After drying, a change of stockings must be made, and fine woollen stockings should be worn. It is advisable to put on clean stockings every day until the trouble disappears. A little boric powder may be dusted into the feet of the stockings before putting them on.

To prevent blisters the feet should be bathed in warm water to which either a little powdered alum, permanganate of potash or toilet vinegar has been added. An excellent powder for the purpose is made by mixing together 1 oz. each of alum, rock salt and borax. A tablespoonful of this mixture can be added to the bathing water. The feet should be thoroughly dried and rubbed with methylated spirit or toilet vinegar, particular attention being given to the heels and the sides of the foot. A little fuller's earth dusted into the inside of the foot of the stocking is useful. If, in spite of all precautions, a blister makes its appearance, it must be carefully dressed to prevent it from sticking to the stocking or being irritated by further friction. A useful preventive is to rub the feet over with witch hazel, and dust them with talcum powder.

For rheumatic and gouty feet relief may often be

obtained by means of a footbath of water as hot as can be borne, with a tablespoonful or more of bicarbonate of soda added. The feet should be soaked in it for a period varying from ¼ to ½ hour, hot water being added to maintain or increase the heat.

Treatment of Cold Feet. Amongst infants and children indigestion and colic may result from cold feet, while in the case of adults sleeplessness is very often brought about in the same way. The underlying cause, which should be treated, may be anaemia, chronic digestive trouble, neurasthenia, etc. As a palliative thick woollen stockings and roomy boots (not low shoes) should be worn in winter. A pair of fibre or loofah soles in the boots is an excellent preventive of cold feet. No one should go to bed with cold feet. Warming them at the fire is not free from the risk of aggravating the condition. Exercise is a better method, and has more lasting effects. Another plan is to dip the feet for one or two seconds in cold water and then rub them briskly with a warm towel.

FOOT. This measure of length, one of the commonest in use, consists of 12 inches. Three feet make a yard, and there are 5,280 feet in a mile. A square foot consists of 144 square inches, and 9 square feet make a square yard. A cubic foot consists of 1,728 square inches, and 27 cubic feet make one cubic yard. The usual abbreviation for both singular and plural is ft., which is used throughout this work. *See* Long Measure; Square Measure.

FOOT AND MOUTH DISEASE. This is the popular name for Aphthous fever of animals. It occurs in epidemics which may be widespread. Large and small blisters appear on the lining of the mouth and on the feet. Cattle, sheep and pigs are chiefly affected, but it may extend to other domestic animals. From them it may be conveyed to human beings by milk, butter, cheese, through wounds, and by other means. It is generally a mild disease in human beings, usually lasting 6 or 7 days, but fatal cases do occur. Milk should be boiled when the malady prevails.

FOOTBALL. There are two kinds of football, a round one used in the Association game and an oval one used in the Rugby game. In both the inflated inner ball is protected by a leather covering. When the outer covering gets torn or worn through in a particular spot it can be easily repaired by sewing on a fresh piece of leather. Damage to the bladder involves a little more trouble. A usual method of repairing a puncture is to cut out a circular piece of sheet rubber large enough to cover the damaged part completely and leave a margin over. This piece is applied to the bladder with a solution of india-rubber and naphtha.

A tire repair outfit generally includes patches and solution which are suitable for repairing a football, but the solution may be purchased separately and old pieces of bicycle tire can be used to cover up the puncture. For an effective repair it is essential that pressure should be maintained until the solution has dried thoroughly, and the football should not be used for at least a day afterwards.

A practical method is to lay the bladder on a hard, flat surface, press the patch in its place, then put a book or other flat object over the patch, and cover the whole with an iron weight from a kitchen weighing machine, or any other available weight.

Football Boots. Since the first essential of the football boot is strength, care should be taken when purchasing to examine the stitching and to see whether there are any flaws. The best boots have several rows of stitching at each seam, and those showing any signs of broken threads, or stitches so near the edge of the leather that they fail to catch it up, should always be rejected.

Next to strength it is most important that the boots should be waterproof. To ensure this the soles of the best boots are made of first quality chrome-tanned leather. There are many qualities, and it should be remembered that the mere fact of tanning with chrome salts will not turn a poor quality hide into first-class chrome leather.

There are good makes of chrome that are not stamped, and the grain should be examined for imperfections. In good leather this will be firm and even over the whole surface, and should feel firm and hard to the touch. The grain side should be entirely free from surface cracks, however minute, as these indicate that the leather has probably been tanned from what are termed drysalted hides. A boot made from leather of this sort will quickly become cracked and perished. Chrome-tanned leather is considered to be absolutely waterproof, and is recognizable in general by its dark green colour. A football boot made of sound vegetable-tanned leather will be found almost equally serviceable, provided it is kept well greased to render it waterproof.

A good pair of boots should last several seasons, provided that they receive proper treatment. The leather studs on the sole should be renewed as soon as they show signs of wear, and the services of the shoe repairer or harness maker immediately requisitioned to make good any burst stitches. After play the boots should be thoroughly dried away from the fire, all mud removed, and cod or other fish oil well worked into the leather. Failing fish oil, Russian tallow or mutton fat may be used with good effect. This will keep the boots supple and waterproof, and prolong their life much beyond the average. They should be well cleansed and greased before they are laid aside between seasons.

FOOT BATH. When a foot bath is taken to check a cold, or for any reason to draw blood from other parts, it should be as hot as can be borne. An ounce of mustard or a cupful of salt added to the hot water increases the beneficial effects. The legs should be covered with a blanket during the process, the feet should be quickly dried with a warm towel, and then

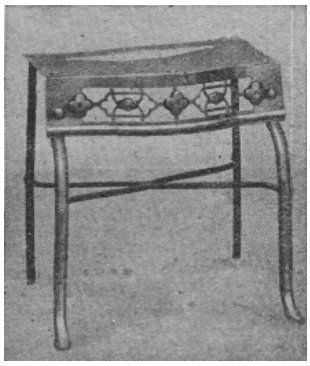
covered with a piece of warmed flannel or a pair of thick woollen stockings.

A warm foot bath promotes sleep and removes the feeling of tiredness after a day's walking. When a full bath is not taken every day, a cold foot bath in the morning is very refreshing and keeps the feet warm in winter. Alum, or enough permanganate of potash just to tinge the water, will help to diminish the tendency to sore feet when much walking has to be undertaken. *See* Bath.

FOOTMAN: The Manservant. The indoor duties of a footman are in some respects those of a parlourmaid, and include laying and waiting at table, answering bells, looking after the fires and lighting, cleaning the silver, and opening the door to visitors. During the earlier part of the day he will be expected to clean windows and knives, fill coal-scuttles, and clean boots. He will also be expected to valet when required and to carry messages or letters. In large establishments several footmen divide these duties and are under the butler.

A footman wears a livery provided by the employer. The old male servant's licence costing 15s. a year has been abolished, but a footman must be insured under the National Health Insurance scheme. His employer is also liable for him under the Workmen's Compensation Acts. *See* Insurance Servant.

FOOTMAN: The Piece of Furniture. The name of footman is given to an antique metal stand used for keeping plates and dishes hot in front of the fire in the dining room, and usually made of polished brass or steel. They are still used as a decorative and practical accessory on the old-fashioned hearth.



Footman. Eighteenth century English example in wrought iron with cut steel front.
(By permission of the Director, Victoria & Albert Museum, S. Kensington)

FOOT RULE. Foot rules are made of boxwood, with folding joints, or of steel, either in a single piece or jointed. They may be from 1 to 3 ft. in length; the average is 1 ft. subdivided into fractions of an inch, ½, ¼, ⅛, or even as small as 1/64. More accurate measurements should be taken with such instruments of precision as a caliper gauge or a micrometer. Boxwood rules should be kept in a dry place, and the metal joints occasionally oiled to prolong their life. Steel rules require oiling from time to time to prevent rusting, or they can be nickel-plated. A folding rule with a firm joint can be used as a bevel square in cases of emergency.

FOOTSTOOL. This stool is made in many shapes and sizes. It may be low and circular, octagonal or square, and covered in bead work or needlework, or in such materials as tapestry, leather, imitation leather, velvet, and carpet. It may be an oblong stool with feet and a wooden frame upon which cane or rushwork is stretched. It may extend the width of the hearth and be known as a fender stool. The modern footstool may also be amplified into a high stool to serve the double purpose of a support for the feet or a low seat. *See* Pouffe; Tapestry.

FORBIDDEN FRUIT. This is the popular name given to Citrus decumara. It is a good greenhouse pot-plant for decorative purposes, flourishing in a mixture of loam and silver sand. If given an annual dressing of animal manure it does not need repotting for years. The plants may be stood out of doors during the summer months.

FORCEMEAT. Forcemeat is a savoury mixture, the foundation of which is breadcrumbs mixed with eggs and seasoning. It is used to stuff boned joints, veal, fowls and other birds, hares, fresh haddocks, and other baked fish. Forcemeat balls are sometimes used in addition as a garnish.

The following is a simple recipe for a forcemeat that can be used with veal. Add 4 oz. of very finely-chopped suet to 6 oz. of breadcrumbs, and the grated rind and juice of half a lemon. Season it with salt and pepper, and add a dessertspoonful of mixed herbs. Bind the forcemeat with a beaten egg, and, if more moisture is necessary, add a little milk.

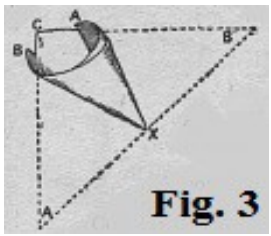
Forcemeat Balls. To make forcemeat balls form the mixture into balls, using a little flour if too moist, dip in beaten egg and fry golden brown. Or they can be baked in the dish with the meat with which they will be served.

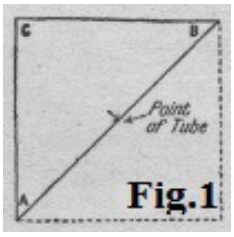
Brain cakes or balls are made from calves' or sheep's brains, and are used for garnishing a calf's or sheep's head. *See* Brains; Breast; Chestnut; Hare; Liver; Oyster; Pigeon; Sausage; Veal.

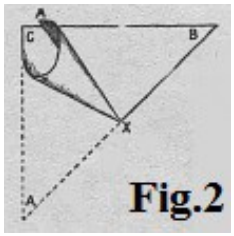
FORCING: In Cookery. Forcing is the process by which ornamentation of sweet or savoury dishes by cream, butter, or sugar mixtures is carried out. Forcing pipes are of many varieties, and they determine the pattern or design of the decoration. A syringe or bag to which funnels of different shapes are attached is used. Forcing sets can be bought for a few shillings and, although the process is not easy to a novice, practice soon brings mastery of the forcing syringe. The icing, which should be of a firm, creamy consistency, should be placed inside the syringe, about half filling it. The handle, with the pump pulled out as far as possible, is screwed on and then gently pressed downward, the icing being forced out through the funnel. *See* Decoration; Icing.

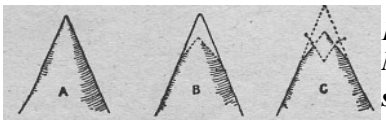


Forcing Bag made of paper, as shown in the diagrams below. The cream is expelled through point of tube by pressure.



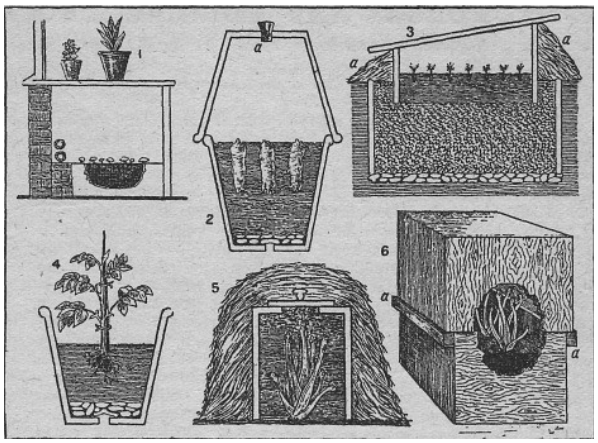






Forcing. Figs. 1-3. Method of folding a square of greaseproof paper to form an effective bag for making cream decorations. Below, how to cut the tip of the bag, A, for plain piping, B, for leaves, and C, for making stars.

FORCING: In Gardening. The art of bringing crops to maturity in advance of their natural season by means of artificial heat is known as forcing. In large gardens the process is usually carried out in forcing-houses, scientifically heated; but it is quite practicable under less elaborate conditions, and out-of-season crops may be obtained by means of a small, warm greenhouse, a hotbed in the open, or even in the cellar of a dwelling-house.



Forcing. Examples of methods of forcing in gardening. Explanatory details of the above diagrams will be found in the text.

Fig. 1 shows how mushrooms can be forced beneath greenhouse staging in soil kept in position by boards, and secluded from light by sacks or draping tacked to the edge of the staging. Sea kale, rhubarb, chicory, etc., may be forced in this manner. Other methods are shown in Figs. 2 and 6, the former being merely a flower-pot inverted over another containing the plants, with a cork plugging the top drainage hole (a), while the latter displays a box holding roots, with another turned upside down and placed on top. These three methods are equally useful in the greenhouse, or sheltered in a cool, dry cellar or shed.

Methods of forcing in the open air are shown in Figs. 3 and 5, the former being a sectional drawing of a good type of forcing-pit, by means of which many crops may be raised with success. It consists of a hotbed sunk 2 ft. deep, resting on a layer of brickbats, and boarded round the sides. A frame, some 9 in. narrower than the pit, is placed on top, with about 9 in. of soil inside. Such a pit must always be situated in well-drained land, where the manure will not get water-logged during wet periods, and during frost it should be banked round with leaves or litter, as at *a.*

Fig. 5 shows how rhubarb, seakale, etc., may be forced by means of a box placed over the plant, this in turn being covered with leaves or stable litter. A hole is cut in the bottom of the box, so that growth progress may be observed at times, the hole being covered with a removable slab, as shown. Old baths, flower-pots, and other cast-off receptacles, may be used.

Fig. 4 shows how early potatoes may be secured in pots placed in a light, warm greenhouse. A tuber is planted with a single sprout in a pot, with about the quantity of soil shown in the sketch, the pot being filled up with rich soil as soon as the plant has grown to a height of about 6 in. *See* Asparagus; Frame; Frost; Greenhouse; Hotbed; Manure.

FORFEITS. In many children's games failure to accomplish a task set, such as guessing something, or breaking a rule, e.g. answering out of turn, or failing to escape from a pursuer, is punished by the offender forfeiting something, e.g. a trinket or handkerchief. At the end of the games these forfeits are called and redeemed, and the process often affords considerable amusement.

One player is chosen to act as judge. He may kneel or sit, but it is essential that he does not see the forfeits. These are held, one by one, over his head, and a jargon which takes various forms is gone through. The judge may be asked: "What is this I hold over your head?" or words to that effect. He in return asks whether its owner is a lady, or a gentleman. He is told and is then asked what the lady or gentleman who owns the forfeit must do to redeem it. Ignorant of the identity of his victim, he then pronounces sentence, and the victim must endeavour to do what he or she is ordered.

The humour of the game lies in these sentences, for they consist of silly and apparently impossible tasks, or actions likely to make the performer look foolish. Such are, bite 2 in. off the end of the poker, which is done by biting with the poker 2 in. away; leave the room with two legs and return with six, which is done by returning carrying a chair; pile two or three chairs upon each other, take off your shoes and jump over them, them referring to the shoes. The player may be

told to pay a compliment to every person in the room; to crawl under the table and bark like a dog; to answer "No" to questions put to him by each member of the company in turn; to repeat a verse, stating the number of the word after saying each one; or to hold one foot in his hand and hop round the room. A popular forfeit is for a person to be asked to spell the word Constantinople a syllable at a time. As soon as he gets to the letter i, all the other players shout 'No,' which is the following syllable. The speller, however, naturally thinks that he has made a mistake, and begins again, only to meet with the same disconcerting shout when he reaches it the second time. Another forfeit invariably affording amusement is to require the person to laugh in one corner of the room, to sing in another, to cry in another, and to whistle in the fourth. *See* Children's Party.

FORGES AND FORGING PROCESSES
Equipment and Instructions for the Amateur Metal Worker

This contribution may be usefully supplemented by reference to such entries as Bent Iron Work; Brazing; Soldering; Welding; Wrought Iron Work. See further the articles on Boring; Hardening; Metal Work, etc.

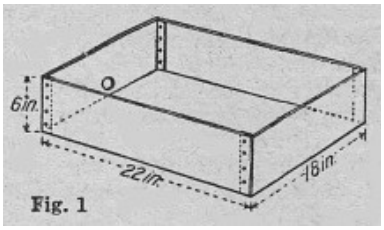
A knowledge of elementary smith's work is of value to the amateur worker. Much can be done with a few simple tools and a homemade forge. The materials mostly used are wrought iron and mild steel. The latter may have a blue-coloured surface, when it is known as Bessemer. A cold-drawn mild steel is preferable for many purposes, as it has a clean bright surface and is better for cold working, since it avoids the necessity for much cleaning and filing.

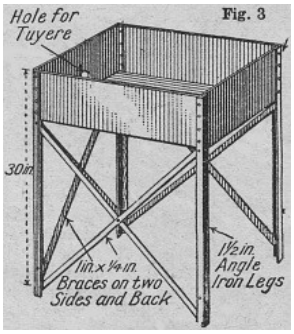
Practically speaking, the methods here de-scribed for the hot working of the metal can be applied to cold bending, except that the metal cannot be bent to such a sharp angle when cold without risk of cracking at the bend. Wrought iron should seldom be bent cold, except when the bends are in the nature of a long curve, and free from any suggestion of a right-angle bend. The essentials are a forge, an anvil, some hammers, and a few simple forge tools, such as tongs, which the amateur can make, one or two chisels for cutting metal, and some sets and swages, as well as a strong leg vice.

Making a Forge. The simple forge shown in Fig. 3 can be made as follows, and deals with metal up to 1 in. or so thick. The pan (Fig. 1) is made of a piece of stout sheet iron about No. 18 gauge and cut to the shape shown (Fig. 2) with a cold chisel, the sides bent up at right angles and the corners riveted together. The stand is made from four pieces of angle iron about 1½ in. by 3/16 in. thick, riveted to the corners of the pan at the top, and braced together at the back and two sides with diagonal struts of flat iron strip about 1 in. wide and ¼ in. thick, riveted at the top and bottom to the angle pieces.

The bellows should be of the double action type. The outlet pipe is connected by an iron pipe to the back part of the pan, using standard iron gas fittings for this purpose, and taking care to make an airtight connexion by the use of red lead paint smeared on all joints before screwing them together. The tuyère can be purchased if desired, but an efficient substitute can be made from a short length of iron pipe screwed to the air pipe in the manner shown in the diagram (Fig. 4), and fitted with a reducing bush at the outlet end, or nozzle. The nozzle should be about 6 to 8 in. from the back of the pan, and nearly at the bottom.

Forge. Figs. 1 and 2. Pan for a home-made forge. Fig. 3. Pan and framework complete.





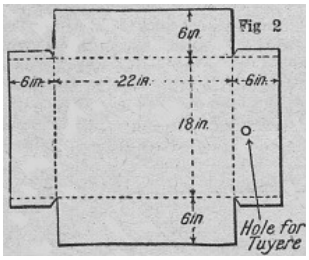
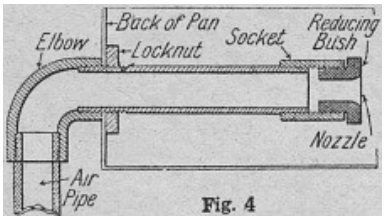


Fig. 4. Section of tuyère and pipe connexions.



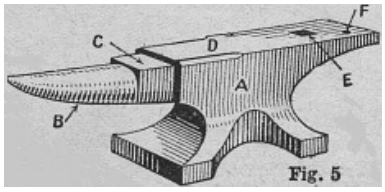


Fig. 5. Parts of anvil described in text. Fig. 6. How the tongs should grip the metal.



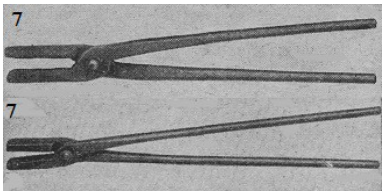
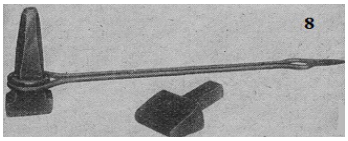


Fig. 7. Above, round or hollow-jawed tongs; below, open-mouth tongs.



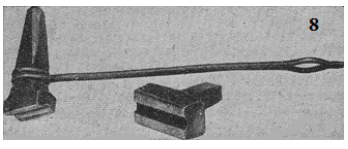


Fig. 8. Above, top and bottom fullers; below, top and bottom, rounding tools.

The fire can be lighted with paper and pieces of wood in the usual way, and the bellows worked gently to draw up the fire as soon as it has taken hold. The fuel should be coke or fine slack coal, the former for preference, as there is less smoke. It must fill the pan and be heaped up in the form of a mound, and as the bellows are worked the air will escape through the fire and form a crater of intense heat. It is then known as a clean fire, and is in the required condition for working.

The iron is placed inside and covered with more fuel to exclude the cold air. The surrounding coal may be damped slightly from time to time. The clinker and slag is raked out from the fire, and new coal added as required. The metal should always be covered with the fuel, as this saves much waste and ensures a good heat. The metal is withdrawn occasionally to ascertain the progress of the heat, and as soon as the iron is a good bright red heat, generally known as a cherry red, it is in a fit state to work.

Anvil and Tools. The anvil should not be less than 1 cwt. in weight, and heavier for preference. It should stand on a solid box as a base, and the top of the anvil should be about 26 in. above the floor. The parts of an anvil are lettered as follows in Fig. 5: A is the body, generally made of wrought iron; B is the horn, and C the base of the horn; D is the face, made of hard steel welded to the body; E is the hardie hole, and F the pritchel hole. The hardie hole is used to hold the shanks of the tools, and the pritche1 hole to permit the passage of stock metal while making bolt heads and the like. The two side edges of the face are often rounded off for a short distance from the horn in order to facilitate the bending of rod metal.

The best hammer for all round use is a ball peine one weighing 1½ lb. to 2½ lb. The face should be rounded off slightly so as not to mark the hot metal, and to assist in preventing the face of the hammer breaking away at the corners. The front edge of the face is known as the toe of the hammer, and the back or face nearest to the worker as the heel. A 3½ lb. cross peine hammer, or a hand sledge of about the same weight, will answer practically all requirements. A sledge hammer is only needed when a helper or striker is available, and one who is capable of handling the tool in the proper manner, otherwise the amateur had better be content with the hand hammer.

A pair of flat-jawed or open-mouthed tongs, and a pair of hollow-jawed tongs can be made or pur-chased. Their form is shown in Fig. 7. To hold the work properly the tongs should be fitted to the thickness of the job by heating the jaws to a red heat and hammering them together while a piece of the metal to be held is gripped between the jaws, as in Fig. 6. The tongs should not be left in the fire.

Other tools that may be purchased as occasion demands are a flatter, one or two fullers, and one or two rounding tools or swages. The appearance of these can be judged from the illustrations (Fig. 8). The flatter (not shown) resembles the top fuller, but has a large square head. Flatters, fullers and swages require an assistant to hold the tools. The shank of the bottom tool rests in the hardie hole of the anvil, as shown in Fig. 11 on the next page. The vice must be a good strong one of the regular blacksmith's or leg type, as shown in Fig. 9, and in addition it must be firmly fixed to a strong bench.

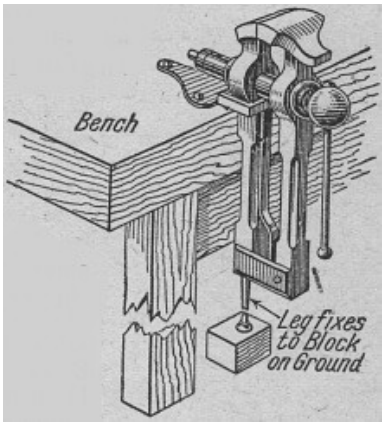


Fig. 9. Blacksmith's type of leg vice.

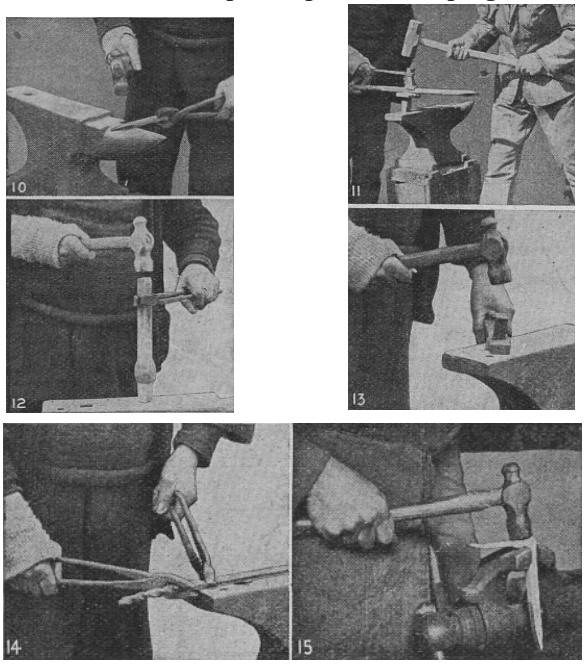
Simple Manipulation. As a first attempt an angle bracket can be made, measuring 6 in. long, 4 in. wide, and from stock 1 in. wide and ¼ in. thick. Take a piece of metal of this size and at a distance of 4 in. from the end make two heavy centre punch marks, one at each side of the bar. Place the metal into the fire with these marks in the centre of the fire, and blow it to a cherry-red heat. Do not use more air than is needed to get a hot fire, as an excess of air causes scale or hard deposit on the surface of the metal. When the metal is red-hot remove it from the fire and place it on the anvil with the centre punch marks on the edge of the face, the bulk of the bar resting on the face of the anvil and the 4 in. part projecting. Hammer it over by hitting the extreme end until the metal is nearly close up to the body of the anvil, then hammer the corner to make it square and true.

It will probably be found that the bar has been knocked over so that the two legs of the angle are not in line, and this has to be corrected by placing the metal on the face of the anvil and beating it flat. Do not work on the metal after it has cooled to a black heat; it must be reheated and the work may then proceed. To flatten the angle faces, they are laid flat on the face of the anvil, and the flatter held by an assistant, while the worker strikes the top of the flatter with the heavy hand hammer.

The same result is obtained by careful use of the hand hammer. The metal can then be cut off to length, either with a chisel and hammer or by the use of the hacksaw. While the work is being heated the greatest care must be taken not to burn the metal, this being apparent by the appearance of bright star-like sparks, or it will be useless.

All manner of flat bends are made in the same way. As an example of curved work, assume that it is desired to make an S hook from metal about ⅜ in. diameter. The first step is to cut the bar to length and true up the ends by means of a file. Heat about half of the metal and, holding it in a pair of tongs, lay it on the

horn of the anvil and hammer on the far side of the horn in such a way as to bend the bar downward. Draw the bar back and forward and continue the hammering until the bar is bent nearly into a circle. Heat the other end and hammer it over as before, using the end of the horn as a guide to the shaping. Then lay the hook on the face of the anvil and flatten it with a blow here and there as requisite to cause it to lie flat. If necessary, reheat the metal and lay it flat on the face, and with a few well-directed taps complete the shaping.



Forge. Fig. 10. Drawing down a piece of metal. Fig. 11. Using the swage tools. Fig. 12. Increasing the diameter of a bar. Fig. 13. Forming the eye around a bolt hole. Fig. 14. Twisting a hot bar with tongs. Fig. 15. Making an angle bend in the vice.

Both the foregoing are examples of simple bending which could be accomplished cold. The use of a forge is more apparent when the sectional area or shape of the bar is to be altered, as, for instance, when converting a round to a square. An example of this is found in a simple bolt which can be made by taking a piece of square stuff equal to the size of the head, and drawing down the bar to a round shape. This is done by hammer-ing it over the base of the horn with the hand hammer, as shown in Fig. 10, thus increasing its length without widening it very much. The bar is drawn out square, hammered on the sides and made octagonal, then rounded and finally finished with the rounding tools or swages in the manner shown in Fig. 11.

Increasing the Diameter of a Bar

The process of increasing the diameter of a bar is known as upsetting, and is accomplished by holding the heated bar upright on the anvil and striking it on the end, thus reducing its length. If the heat is located at the end of the bar, and that end dropped vertically on the anvil, and then struck a blow, it will bulge out at the bottom. By localizing the heat, that is, by heating as nearly as possible at the desired spot, and cooling the adjacent parts with water, the bar will bulge at the hot part and nowhere else when it is struck on the end as shown in Fig. 12. Local swellings, as for example the eye around a bolt hole, are formed by driving a punch through the hot metal and then inserting a mandrel, or tapered piece of steel, and hammering the edges of the metal while the bar is in the hole, at the same time keeping the bar driven up into the hole (Fig. 13).

Some very effective work is accomplished by twisting a bar of hot metal. This is done by gripping the bar in the vice and twisting the other end with a strong spanner or with two pairs of strong tongs, as in Fig. 14, of a size to suit the bar being twisted. Instead of doing all the bending on the anvil, the amateur will find that good results are given by grasping the work in the vice and then knocking over the part to be bent; but this must be done quickly (Fig. 15).

FORGET-ME-NOT. The popular name of myosotis, of which several kinds are grown in gardens. Some of them are suitable for the rockery, while others are used for filling spring flower beds in association with bulbs. The common early spring forget-me-not is Myosotis dissitiflora; it is a mistake to grow the ordinary kind, for there are modern varieties with rich blue flowers which provide a finer display. Royal Blue is one of the best. Seeds are sown out of doors on a prepared seed bed in May, and the seedlings, once transplanted, are finally planted in autumn where they are to bloom in spring. The easiest way to raise a fresh stock of forget-me-nots is to lift a few old plants when the blooms have faded and replant them on a reserve border where the seeds will fall and produce numerous self-sown seedlings. Myosotis palustris, the water forget-me-not, is a beautiful flowering plant very effective for the bog garden and water side.



Forget-me-not. Flowers and foliage of a variety of Myosotis.

One of the best rock garden forget-me-nots is alpestris; it flourishes in well-drained gritty soil and is raised from seeds sown in a pot of light sandy soil placed in a frame in spring. The so-called New Zealand forget-me-not is Myositidium nobile, a vigorous plant 15 in. or more high, with large evergreen leaves and blue forget-me-not like flowers in summer. It is a difficult plant in many gardens and is usually happy only in the mild western maritime counties.

FORK: For the Table. Some forks are entirely made of silver or plated metal, but fruit and fish forks may have handles of ivory, mother of pearl, bone, or

their substitutes. Silver forks will last a very long time, but electro-plated ones tend to become tarnished as time goes on.

Pickle forks are obtainable with telescopic handles, which enable them to be extended to reach to the bottom of a tall jar and obviate soiling the fingers. In choosing carving forks attention should be paid to the safety claw. In the best makes of stainless steel, the claw ensures perfect control over the joint or poultry which is being carved.

An implement exists for cleaning between the prongs of a fork. It consists of a number of small spiral brushes mounted in a wooden surface, the brushes being so placed that they just fit in between the prongs.

The table fork seldom calls for more in the way of repair than a re-shaping of bent prongs, which are easily straightened out with a small hammer and a hardwood block. At the same time, the points may be re-sharpened, or re-shaped, with the aid of a small file. In both operations care should be exercised to avoid damage to the plate, should the fork be electro-plated, by hammering cautiously and lightly, and by only using the file in order to take off any roughness on the prong.

Carving forks, and others, such as those used for table condiments, are often made with ivory, horn, or bone handles, and these become loose and require refixing. Many of the modern forks are made with a serrated tang which is claimed to be immovable, whereas the earlier forks were nearly always secured by rivets passed through the handle and the tang of the fork. If the tang has been riveted and the rivet be broken, it merely requires a new rivet, and to load the hole in the handle with liquid cement immediately prior to inserting the tang in its place. If the tang is broken off at the rivet hole, as is often the case, the amateur will do well simply to refix the fork on to the handle by filling the hole in the handle, then pushing the fork into place, allowing it to set hard, and then drilling a small hole through the handle and the tang and securing it with a rivet.

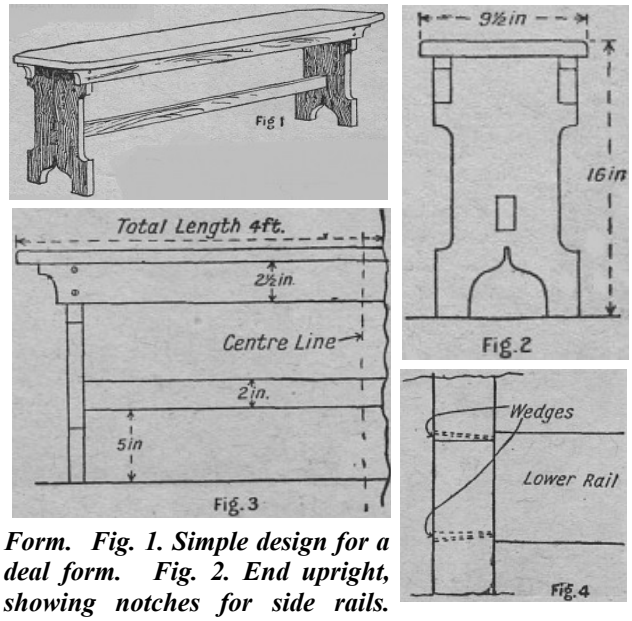
The cement used may be composed of resin and white sand, or 6 parts of resin, 1½ parts of beeswax, and 1½ parts of plaster of Paris, dissolving this by first heating the beeswax and resin, and then stirring in the plaster until a thin, soft paste is formed. The tang should be warmed prior to inserting it into the cement-filled hole in the handle.

Broken Guards. Carving forks frequently suffer from a broken guard. Their repair depends upon the design. Generally a flat spring sunk into a recess formed in the fork keeps the guard in place. Should this break, punch out the old pin, while holding the fork over a suitable hole in an anvil or on a block of wood or lead. Then clean out the slot and remove the old piece of spring; obtain a new one to pattern, insert it, replace the guard, and grasp it in a vice or strong pair of pliers, using a piece of leather to prevent the fork from being scratched.

Then with the assistance of a piece of steel wire of appropriate thickness, previously prepared and pointed at one end, feel for the holes, drive the pin through, test the guard to see that it works properly, finally cut the wire off close to the fork at each side and slightly rivet up. Take care not to rivet the guard too tightly, or it will be prevented from working. *See* Carvers; Cutlery; Knife; Pickle Fork; Silver; Toasting Fork.

FORK: For the Garden. A garden fork is usually a three-pronged implement, the fork part being of iron and the shaft or handle of wood. It is used for turning up the soil, digging up potatoes, and for other work where it is more suitable than the spade. A good fork should have the handle well fastened to the prongs. It should not be left exposed to damp, as the wood may rot. *See* Digging; Spade.

FORM. This simple design of seat has its domestic uses. Fig. 1 represents a type suitable to be made in deal. The necessary dimensions are indicated in Figs. 2 and 3. The end uprights are cut from 1 ¼ in. stuff to the size given, allowing 1 ¼ in. for the thickness of the top. At the top edges, corner notches are cut away to take the side rails (Fig. 2), which are screwed in, and a mortise cut lower down in the centre for the lower rail.



Form. Fig. 1. Simple design for a deal form. Fig. 2. End upright, showing notches for side rails. Fig. 3. Part of side elevation. Fig. 4. Lower rail, showing wedges.

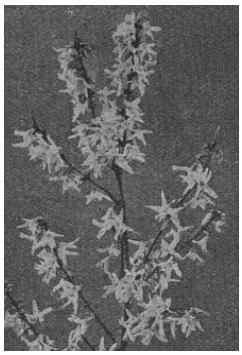
A small shoulder is cut on both edges of this rail, so that allowance must be made for this in the mortise; also for the wedges (Fig. 4). Having made the joints, the shapings may be cut on the ends and the three rails prepared. It will be noticed that the top rails project beyond the ends, this giving greater strength to the screws, which would otherwise be apt to break away at the ends.

When putting the job together glue the lower rail in first and wedge it, and screw the other rails on afterwards. The top may be secured by screwing from

underneath, or may be nailed on if desired, in which case the nails should be punched in. For a hall the form might be stained dark oak and polished. If intended for a nursery it can be enamelled white or any pale shade, the uprights and corners being decorated with suitable stencils.

FORMALIN. A watery solution of formaldehyde, formalin is a powerful antiseptic. It is much used as a disinfectant, as it has the advantage of not affecting coloured materials. *See* Disinfectant; Fumigation.

FORSYTHIA (Golden bell shrub). This is one of the finest of all early flowering hardy shrubs. In March and April the leafless branches become wreathed in yellow bell-shaped blooms. The best for the average garden is Forsythia spectabilis 6-8 ft. high. Forsythia suspensa, which is of slender, rather drooping growth, may be planted in the open but it is better on a wall; it thrives fairly well on a shady wall but better on a sunny one. The pruning of forsythia is carried out as soon as the flowers are over; old branches may then be cut out and others shortened. The object is to force the shrub to make fresh shoots which will bloom well the following spring. Forsythia flourishes in ordinary soil and is easily propagated by bending down the tips of branches and pegging them in the soil. When firmly rooted the ends of the branches should be transplanted.



Forsythia. Spray of the brilliantly coloured flower-ing shrub known as the golden bell tree.

FOULARD. Foulards are often, but not invariably, woven with a fine twill, and are firm without being stiff or heavy. The name is given rather to the design than to the fabric itself, which may be woven of silk or mercerized cotton.

The commonest type is blue with a white bird's-eye spot. Black and brown are other favourite colourings with a white spot, which is obtained by discharging the colour, so showing the white of the original silk beneath. Oriental and conventional floral designs are also frequently used.

Cotton foulards have not the good appearance of silk, soil more quickly, and when creased do not lose their folds readily. *See* Silk.

Foundations. *See* Brick; Concrete.

FOUR-STROKE or Otto Cycle. This is the term given for the cycle of operations in the most common type of internal combustion engine. The full cycle occupies two revolutions of the engine crankshaft; a complete operation is performed by a half-revolution of the crank, it being understood that a half-revolution completes the full distance travelled by the piston. The sequence of the cycle is (1) induction: the gases are drawn in by the descending piston; (2) compression: the gases are compressed by the rising piston; (3) explosion: the gases are fired, and force the piston down (power stroke); (4) exhaust: burnt gases are expelled by the rising piston. *See* Internal Combustion Engine; Motor Car; Two-Stroke.

FOWL: Choosing and Trussing. In selecting a fowl for roasting, choose one that is young and plump. Male birds are superior to hen birds for roasting; they should have big feet and knee-joints, and the claws and beak should be easily broken, while the breastbone should be supple. If the neck and feet are very thin and a purple tinge is visible through the skin of the thigh, the bird is old. Old birds may be used for boiling or in the preparation of many made dishes, and the carcasses are excellent for improving the strength and flavour of stock for gravies and soups. An old fowl which would be tough if roasted in the ordinary way can be rendered eatable if boiled gently for an hour and then roasted for half an hour in a moderate oven.

When the bird is prepared at home, commence plucking from under the wings, then gradually work all the feathers off the bird, clearng the breast first. Care must be taken not to break the skin by dragging off the feathers roughly. Pick out the stumps remaining in the wings and legs, and singe off the hairs with a lighted piece of white paper. Lay the fowl on its back on a table and sever the neck where it joins the body. Remove it with the head, but leave sufficient skin in front to turn neatly underneath and cover the opening. Draw out the crop and loosen the entrails, cut across the vent and insert the fingers in the bird to find the gizzard. Pull this out, together with the remainder of the inside, and wash the neck, heart, liver, and gizzard, cutting open the last-named and removing the bag of stones inside it. It is important that the gall-bag should be taken away unbroken, otherwise anything it touches will be bitter.

How to Truss. Before trussing the fowl, scald and scrape the feet and scaly part of the legs. Cut off the feet and throw them into the stockpot, then wipe the bird inside and out with a cloth dipped in hot water. The bird may now be stuffed at both ends with veal forcemeat, if desired. To truss the bird for roasting, twist back the wings so that they form triangles at the back; then thread a trussing needle with string and make a knot at the end. Pierce the nearest pinion, taking the needle out at the back and catching in the skin of the neck, which should be folded neatly over. Draw the needle through the pinion on the other side, then return, piercing the wing lower down and catching in the top of the thigh on each side. The needle should come out through the lower portion of the pinion. Unthread the needle, tie the two ends of the string securely, and the wings should be in shape.

To truss the legs, pass a threaded needle through the end of the thigh-bone at the back and arrange the legs

neatly, folding the skin of the lower portion of the breast under them. Draw the needle back, catching in the legs, passing through the flesh and come out through the wings; then tie the string securely. If fowls are trussed without skewers they are more easily dished up, and all that is necessary to untruss them is to cut the string and pull the knotted end. To truss for boiling, loosen the skin of the legs by working it free with the fingers. Cut the bones of the feet right up to the flesh, and push the legs up into the body until they have disappeared under the thigh. The trussing may now be completed as for roast fowl, except that the stumps of the legs must be so arranged as to be invisible. All the methods of cooking chickens can be applied to fowls. *S e e* Boning; Carving; Casserole; Chicken; Curry; Duck; Egg; Forcemeat; Giblet; Goose; Poultry; Stuffing; Turkey.

Fowl Manure. This is of great value in the garden, but it is potent and must be used with care. The best plan is to keep it under cover and to mix it with twice its bulk of soil before use. The mixture may be applied to fruit bushes, vegetables and flowering plants in spring at the rate of 3 oz. per square yard or yard run of row.

FOX: The Fur. This fur ranges in value from that of the Japanese, Kitt, Turkish, and Patagonian foxes to the more expensive white, blue, and silver. The cheaper kinds are almost invariably dyed, and may be obtained in a variety of colours. The fur sold as black fox is almost always a red or white skin dyed, as the genuine black fox is rare and extremely expensive. Silver fox is also rare, and for firmness and softness it has no equal. Blue fox fur is brownish grey in colour, or, in the best specimens, a deep slate.

Arctic or white fox is considered the best kind for dyeing purposes, as its skin is less likely than others to change colour after the process. As a white fur, however, it needs frequent cleaning, and should not be worn in a smoky atmosphere. Hot bran, rubbed into the fur and brushed or beaten out again, is the best cleaning medium.

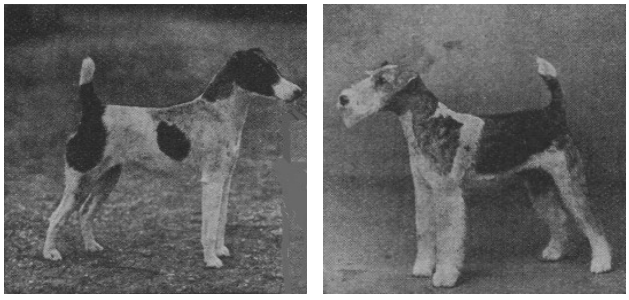
Cross fox is of the same species as red fox, but its coat is marked with yellow streaks and a dark line runs down the centre of the back. Grey fox is used largely for making rugs and footbags, Fox furs generally, because of their softness and tendency to mat, are not recommended for durability. *See* Fur.

FOX AND GEESE. This is an excellent game for a children's party, either indoors or out. One person, usually an adult or one of the older children, is the mother goose, while a second is the fox. The remainder form a long chain behind the mother, with arms round each other's waists. It is then the business of the fox to catch the geese.

The mother attempts to stop him doing so by holding out her arms as widely as possible and turning him back whenever he tries to get past her. As he may only take the last member of the chain, and may not force his way past the mother, it requires considerable agility for him to circumvent her. As the chain grows shorter the difficulty increases. The game continues until all the geese have been captured by the fox.

FOXGLOVE. The common foxglove is Digitalis purpurea, a well known plant suitable for the shady border, and for open spaces in the woodland garden. It sows itself freely and there is usually no difficulty in maintaining a supply. Often the seedlings are so numerous as to be a nuisance. The old reddish-purple varieties are far inferior to the modern ones, and these ought to be grown. The Shirley strain of foxglove provides tall plants with fine flowers in many showy colours. The yellow foxglove also is beautiful. *See* Digitalis.

FOX TERRIER. This dog has quick intelligence and most of the virtues that recommend a dog for companionship in the home or on a ramble. It is true, he is properly a sporting dog, bred definitely with the object of entering a fox's earth and driving out the recluse for whom both hounds and hunters are waiting; but he adapts himself quite easily to a domestic ro1e, contenting himself with an occasional rat-hunt or the discomfiture of tramps.



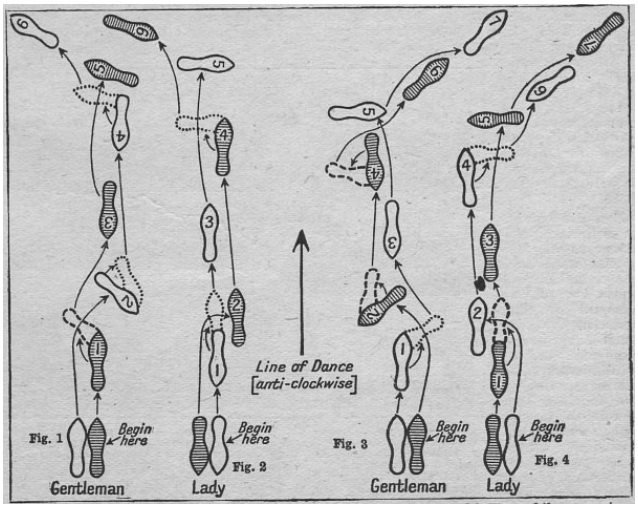
Fox Terrier. Left, specimen of the smooth-haired breed ; right, wire-haired fox terrier.

For his legitimate business he should be rather small, though the show standard permits him to scale anything up to 20 lb. He should have a rather narrow, flat head, with the muzzle tapering to the always black nose. The ears should be small, V-shaped, moderately thick and drooping, and the eyes small, dark and intelligent; the legs straight, the feet round and compact, the hind legs strong and muscular, with long and powerful thighs. White should be the predominating colour, and the markings should be in either brindle, red, or liver colour.

There are two breeds of fox terrier: the smooth and the wire-haired. The former has a short, smooth and dense coat, of which the individual hairs are scarcely apparent. The wire-haired terrier has a similar coat, but it is overlaid by longer and harder hairs which break up the smoothness of the surface and give an entirely different appearance and feeling. *See* Dog.

FOX TROT. The slow fox trot, most difficult of modern dances, is of great assistance in acquiring good

style and balance. Long gliding steps are employed, some taking two beats, counted "Slow" (S.), others one beat, counted "Quick" (Q.), and these, together with the correct use of contrary body movement (C.B.M.) make this dance one of graceful curves, not merely a series of straight steps.



Fox Trot. Figs. 1 and 2. Steps of the natural turn for both partners. Figs. 3 and 4. Those of the reverse turn.

The fundamental steps are the walk and the three-step. For the walk forward, take a long gliding step (S.) straight from the hips, on heel first but going immediately on to flat foot and keeping the weight of the body over the front foot. Repeat with the opposite leg. For the walk backward swing leg well back from hip, going on to the ball of foot first and keeping weight over front foot. As step continues the weight should be carried between the feet and the toes of front foot leave the floor so that the pressure is on the front heel. Repeat with opposite leg. For the three-step take three natural length steps to four beats of music, counted Q.Q.S. When moving forward, go on to heel first, rising on to ball of foot. Take second step on ball of foot, and lower as the third step forward is taken on to heel first. When moving backward, take first step on ball of foot, rising up as the second step is taken on to ball of foot and lowering the heel of this foot as the third step is taken back on to ball.

Standardized figures are the feather step, natural turn (Figs. 1 and 2) and reverse turn (Figs. 3 and 4).

The gentleman's feather step (S.Q.Q.S.) consists of a long step forward with right foot (R.F.), and a three-step taken as follows. Forward with left foot (L.F.), preparing to pass outside partner, forward R.F., outside partner, forward L.F., in front of partner. C.B.M. is used on the first and fourth steps. A rise is taken at the end of the first step, retained for the second and third, and dropped as the fourth step is taken. The lady's feather step commences with a long step back with L.F. followed by a three-step, back with R.F., back with L.F. (her partner steps outside), back with R.F. C.B.M. and rise and drop are the same as for gentleman.

The gentleman's step in the natural turn (Fig. 1) counted S.Q.Q.S.S.S., is as follows: Forward with R.F., turning on it to R. to side with L.F. (commencement of three-step), still turning, back with R.F., back with L.F., turning on it to R.; pull R.F. back to L.F., turning from L. heel on to R. heel, forward with L.F. The lady (see Fig. 2) steps back with L.F., turning on it to R., closes R.F. back to L.F., turning from L. heel on to R. heel, steps forward with L.F., forward with R.F., turning on it to R., to side with L.F., and brushes R.F. through (close to L.F.) and steps back with it. Both dancers use C.B.M. on first, fourth and sixth steps. The figure makes just over three-quarters of a turn.

The reverse turn (Figs. 3 and 4) is counted S., Q.Q.S., Q.Q.S. The gentleman steps forward with L.F., turning on it to L., then takes two three-steps, the first consisting of a step to side with R.F., still turning L., back with L.F., back with R.F., turning on it to L. The second three-step is taken to side with L.F., forward with R.F. outside partner, forward L.F. in front of partner. The lady steps back with R.F., turning on it to L., closes L.F. back to R.F., turning from R. heel on to L. heel, steps forward with R.F., and again forward with L.F., turning oh it to L. ; steps to side with R.F., back with L.F., and back with R.F. Both dancers rise and drop as in the ordinary three-step on the second, third and fourth steps, rise again at end of fourth and remain up for the fifth and sixth, dropping as the seventh step is taken. C.B.M. is employed on the first, fourth and seventh steps. The complete step makes just over three-quarters of a turn.

The diagrams show R.F. shaded; L.F. in outline; position of foot after turning on it, in dotted outline. To follow them face direction of toes, turning diagrams at same time. *See* Dancing; Quick Step; Waltz.

FRACTURE. The usual cause of fracture is external violence. It may be direct, as when a cartwheel runs over a limb, or indirect, as where the jolt caused by a fall on the shoulder or elbow breaks the collar bone.

There will be swelling over a fracture, and a shortening may occur. In the course of a few days the broken ends are connected and surrounded by a mass of soft tissue known as callus, which is later converted into bone. Strong bony union usually takes place, but, instead of bone, gristle or cartilage or simply fibrous tissue may be formed, allowing of more or less bending of the bone, and in this way constituting an un-united fracture.

First aid consists in checking dangerous bleeding by pressure on the main artery, and in the application of an antiseptic or clean dressing to the wound in the case of a compound fracture. In all fractures the ends of the broken bone must be kept at rest to prevent further damage, and if the doctor can be on the spot early, or the accident occurs indoors, this may be accomplished by using pillows, cushions, bricks, etc., to support and restrain the limbs. If the patient requires to be moved at once, splints should be applied, and any material may be used for the purpose if it is sufficiently rigid, e.g. sticks, umbrellas, folded newspapers, etc. When there is difficulty in obtaining splints, an upper limb

may be fixed against the trunk, or the lower limbs can be tied together until splints are available. The splints should be padded with clothing or other soft material and should be applied on the inner and outer sides of the limb.

In removing persons suffering from fractures of the thigh or leg the stretcher should be a rigid one. A door taken off its hinges would be very suitable if a stretcher has to be improvised. If a person suffering from broken thigh has to be carried uphill he should be carried feet first, and the reverse on going downhill, so that the weight of the trunk may not press down on the injured limb.

The first thing done in the treatment of a fracture by a doctor is to set or reduce it, that is, to bring the broken ends as nearly opposite to each other as is possible. Then splints of some sort are applied to keep the bones in their correct position. After a few days the limb is massaged each day, and the doctor makes passive movements at the joints to prevent stiffness. After some weeks the patient will make movements for himself. Before putting the full weight of the body on a broken lower limb he should use for some time a crutch, and later a stout stick.

The term extension for fractures means the mechanical stretching of a limb or part of a limb, and is required most often in fractures of the shafts of the bones. One way of doing this is to fix long strips of adhesive plaster to the sides of a limb, say, the leg. The ends of the strips are attached to a horizontal piece of wood, or stirrup, a few inches below the sole of the foot. A stout cord is attached to the centre of the stirrup by drilling a hole through the latter, and is then led over a pulley and made taut by having a weight attached to its lower end. *See* Ankle; Arm; Bandage; Colles' Fracture; Dislocation. First Aid; Shoulder; Splint.

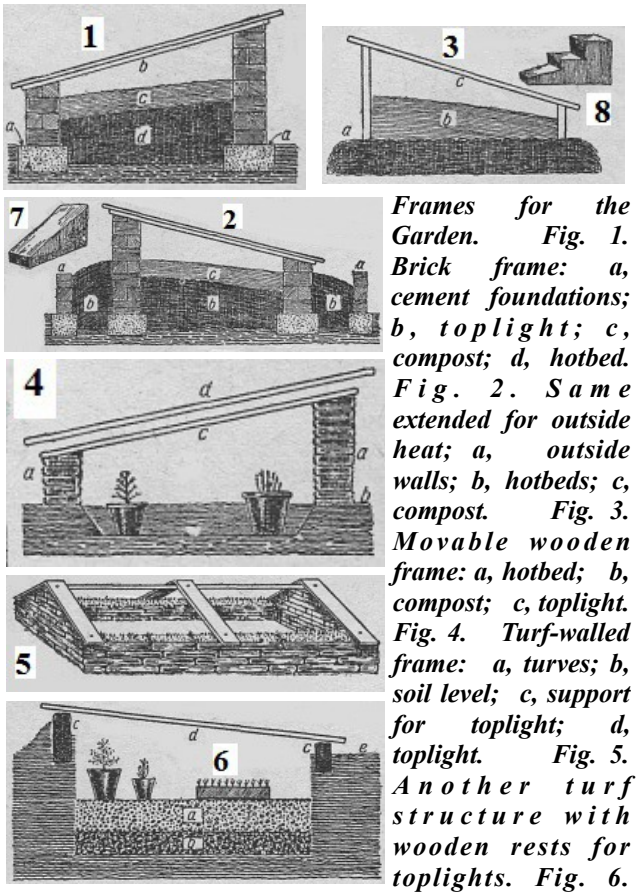
FRAME: For the Garden. Every gardener realizes that a frame removes many of the restrictions which hamper his operations all the year round. It is indispensable for the raising and growing of flowers and vegetables in spring and summer, whilst during autumn and winter it is a means of rearing and preserving plants that would otherwise succumb to the first hard frost. Various types of frames are here illustrated.

It is an advantage to set the frame on a hotbed of manure or of manure and leaves; the hotbed, which can be made up in March, should project 12 inches beyond the frame.

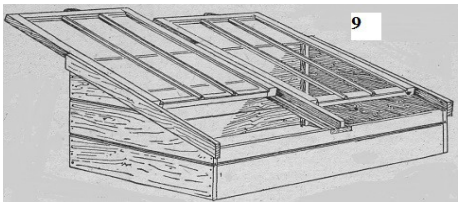
A suitable compost, which should be 1 ft. deep in most cases, is composed of three parts loam and one part leaf-soil. Protection is necessary during severe weather, and this may consist of sacking, mats, bracken fern, etc.

Ventilation lights should always be raised on the opposite side from which the wind blows, using wedged or stepped blocks for the purpose, similar to those shown. Watering should be done early in the day, so that foliage may be dry before night. Plants are more easily cut down by frost while their leaves are damp. Amongst plants and seedlings for raising, growing, forcing, or bringing-on, in frames possessing a mild hotbed, are the following:

Brussels sprouts, cauliflowers, celery, lettuce, mushrooms, parsley, strawberries, rhubarb, onions, tomatoes, cucumbers, early potatoes, leeks, melons, marrows, begonias, violets, pansies, half-hardy annuals, etc.



Frames for the Garden. Fig. 1. Brick frame: a, cement foundations; b, toplight; c, compost; d, hotbed. Fig. 2. Same extended for outside heat; a, outside walls; b, hotbeds; c, compost. Fig. 3. Movable wooden frame: a, hotbed; b, compost; c, toplight. Fig. 4. Turf-walled frame: a, turves; b, soil level; c, support for toplight; d, toplight. Fig. 5. Another turf structure with wooden rests for toplights. Fig. 6. Section of sunk frame for hardening-off seedlings: a, fine ashes; b, cinders; c, bricks to support toplight; d, toplight; e, ground level. Figs 7 and 8. Ventilating wedges.



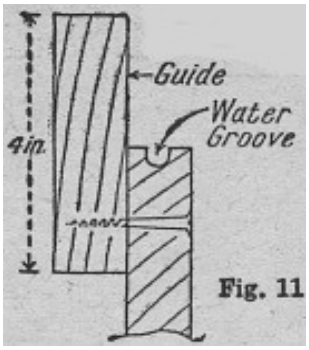
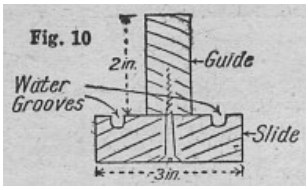


Fig. 11



Frame. Fig. 9. Portable garden frame with sliding lights. Figs. 10 and 11. Details of guides and slides, showing water grooves.

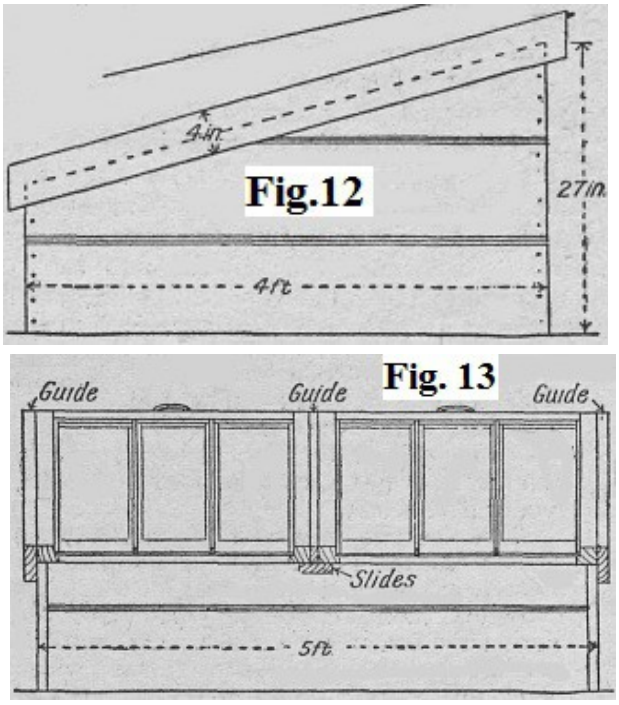


Fig. 12. Side elevation. Fig. 13. Front elevation.

A handy type of emergency frame is shown in Fig. 4. This will be found useful, as a protection for hardening-off tender seedlings, for the growing of early salad vegetables, and for sheltering plants that will not withstand the rigour of winter.

In gardens of ample accommodation a plain brick example may be devised according to Fig. 1, and if necessary by extension as in Fig. 2, in order to obtain increased heat from hotbeds placed outside. Such a frame should be erected in a position with a south aspect. A good average size is 6 ft. wide, 2½ ft. deep at the back, and 18 in. high at the front. If a wooden frame is preferred, the dimensions may be the same.

Where the garden is small a movable frame, similar to that shown in Fig. 3, is recommended. A structure of this kind, during early spring, autumn, or winter, may easily be removed to a position facing south. In summer it can be situated in a spot screened from hot sunshine. The fourth type figured is one built of turves, with a glazed wooden top-light. Another style of turf frame is displayed in Fig. 5, a type often used for the growing of early potatoes.

A Portable Frame. Fig. 9 shows a useful frame of convenient size which the amateur can easily construct for himself. The glazed tops are made to slide. Suggested dimensions are indicated in Figs. 12 and 13. The lower portion can be made in 1 in. matchboarding, nailed together, and with corner blocks screwed inside. At each end, and projecting just the thickness of the top, i.e. 2 in., a guide is screwed from the inside, as in Figs. 11 and 13. A centre slide and guide is made as in Fig. 10, and fixed to the back and front, the slide being cut into these to bring them to the same level. The water grooves formed in the slides should be carefully noted.

The front rail of the top glaring frame is thinner than the other rails, and the glass runs right over it; this is necessary in order to allow the water automatically to run off at the front. The frame is rebated on the inner edge and mortised together, the joints being do welled to fix them; they should be put together with white lead paint, as glue is unsuitable. The cross-bars may be cut in the solid and rebated, or they can instead be of two pieces screwed together; in each case they are mortised into the main frame. A water groove is cut at the under side about ½ in. from the front to prevent the water from creeping back into the frame. If several small panes of glass be used, the upper square should overlap the lower one about ¾ in., and a tack be put at the bottom of each glass to prevent it from slipping; putty is used to secure it in the rebate. All the woodwork should receive at least two coats of paint.

The great value of a portable frame is that it can be placed in the sunniest position during the winter months and in shade for the summer. A most useful type is that which is built against the wall of a heated greenhouse, openings being left in the brickwork to allow the warmth to reach the frame.

In the latest type of garden frame, steel instead of wood is used in its construction. The advantages of this type are that the framework is more durable than in the old wooden type, more light is admitted as the steel sashes are thinner, and the trouble of warping is eliminated. Another type of frame favoured by modern gardeners is the span-roofed. In this the "lights" are hinged to a central ridge, and when open they are held secure by means of steel hoops or rods. Such frames are easy to manipulate as regards ventilating, watering and shading, and can be obtained with either wooden or steel framework.

A garden frame is invaluable for raising plants from seeds and cuttings. In early spring many kinds of half-hardy annuals, herbaceous perennials, and vegetables can be sown in boxes in an unheated frame, the seedlings being planted out in the open garden when danger of frost is past. In early summer the frame may be used for rooting cuttings of rock garden and herbaceous plants, to be followed in late summer by cuttings of summer bedding plants and many kinds of shrubs. Plants that are frost-tender may be grown in the frame during winter, their safety being ensured by covering the frame with straw mats during severe weather. It is wise always to set a garden frame on a foundation of brick or concrete; it will then last for many years. *See* Forcing; Garden; Hotbed Kitchen Garden.

FRAME AERIAL. The form of wireless receiving aerial which is built into a portable or transportable receiver. It usually comprises a number of turns of wire wound round the framework of the set, though in some instances it is made as a separate unit and fixed flat up against the inside of the back of the cabinet.

It is not an efficient type of aerial, but, owing to the

sensitivity of modern circuits, good performances are possible with small self-contained sets employing the principle.

A frame aerial is highly directional. It receives at its best when its plane is in line with the transmitting station. That is why the majority of self-contained sets have turntables in their bases so that they can easily be swung round. There are advantages attached to this effect. For example, the effective selectivity of the receiver is increased and interference, particularly that from other stations, can often be greatly reduced by judicious adjustment of the position of the set. Also these directional qualities of a frame aerial can be used for controlling volume in addition to the automatic or manual volume control incorporated in the set. *See* Aerial.

FRAME SAW. A frame saw is a large flexible saw blade carried in a wooden frame which has a certain amount of "give," so that the saw blade can be tightened by turning a bottle screw. The teeth of a frame saw are coarse, as the tool is intended for rough work, such as firewood. *See* Bow Saw; Saw.

FRANCOA. These graceful plants, popularly known as bridal wreath, are not quite hardy, and are generally grown in pots for greenhouse, conservatory, and window decoration, or they are planted out in conservatories. In mild districts they may be grown out of doors all the year round; in other places they should be kept in a frame during winter. They are propagated by seeds sown under glass in spring or by cuttings. Francoa ramosa, with white flowers, is the favourite kind; it is a perennial, 2-2½ feet high.

FRANGIPANE. This perfume was intended to combine all the chief odours; it has the reputation of being the most lasting perfume made. The recipe is as follows, the ingredients being mixed and allowed to stand for a month, then filtered through absorbent paper:

Bergamot oil	100 drops
Vanilla essence	100 „
Tolu tincture	60 „
Musk essence	50 „
Rose extract	½ oz.
Cassia extract	½ oz.
Jasmine extract	4 „
Alcohol	½ pint

FRANGIPANE CREAM FILLING. This is the recognized term for a filling for pastries, tarts, etc., although often other flavourings, such as vanilla, almond, and so forth, are substituted. It is made in the following way: Melt 3 oz. of butter in a stewpan, add 1 pint of milk, and when nearly at boiling-point beat in ½ lb. of dry sieved flour. Beat this well together until smooth. Stir and cook it over a gentle heat for a few minutes, or until it leaves the sides of the pan without sticking. Cool it for a few minutes, then beat in separately 2 whole eggs and 2 extra yolks. When well blended add 4 oz. of castor sugar, and some flavouring essence. When cold it may be used as desired for filling tartlets, cakes, etc.

FRAUD. Fraud is sometimes a criminal offence. For instance, obtaining goods or money by fraud is a crime. It is also a civil wrong, giving rise to an action for damages. Fraud consists in making a statement of fact knowing it to be untrue, or with wilful or reckless disregard as to whether it is true or not. If such a statement is made with intent that it shall be acted upon, and the person acting upon it suffers loss, it is an actionable fraud. If the person making a false statement honestly believes it true, he is not guilty of fraud.

There is one exception, namely a false statement made in a company prospectus. In such a case, when the statement is proved to be false, every director, promoter, or other person responsible for the prospectus is liable in damages unless he proves that he had an honest and reasonable belief in the truth of the statement.

Any contract induced by fraud may be avoided by the innocent party. He can resist any claim made against him on the contract or can have the transaction set aside, and claim the return of anything paid or transferred under it. But he must be careful to take steps to set it aside as soon as he knows of the fraud. If he does not, or if it is impossible to put the parties back into the original position, the transaction will not be set aside, but the innocent party will be left to his remedy in damages.

As a general rule mere silence or failure to disclose some fact relating to the contract will not amount to fraud. One party is not bound to reveal to the other all the facts known to him about the subject matter of the contract. Sometimes, however, a false impression may be created if certain facts are stated but others are withheld. Where it was truthfully stated that a company had paid dividends for a certain number of years but the fact that these dividends had not been paid out of profits but out of reserves was not revealed, it was held that a false impression was conveyed.

In the case of certain contracts—called contracts uberrimae fidei ("of the utmost good faith")—it is not sufficient that each of the contracting parties should merely refrain from making any untrue statements. They must disclose voluntarily everything they know that is material to the contract. The best example of such contracts is insurance. A man who is insuring his life must tell the insurance company every fact that is material —e.g. that he had a serious illness as a child.

FRECKLES: Their Treatment. For freckles the following remedy is for outward application only, to be applied at night.

Ammoniated mercury	1 part
Bismuth subnitrate	1 „
Olive oil	6 parts
Glycerin	8 „

Soft paraffin	8 „

A lotion which is intended to be applied to the exposed parts of the face, neck, hands, and arms before going out into the strong sunlight, and which speedily dries, leaving little trace of grease, is made up as follows:

Zinc oxide	2 drams
Powdered calamine	2 „
Olive oil	3 oz.
Solution of ammonia	1 „
Rosewater to make	6 „

The following bleaching lotion applied daily with a camel-hair brush has the effect of lightening the colour of the freckles. It should be kept tightly corked.

Fresh peroxide of hydrogen (10 vols.)	1 oz.
Eau-de-Cologne	1 „
Glycerin and rosewater	1 „

See Beauty Culture; Face; Skin.

FREEHOLD. In old English law this is one of the ways in which land is held, others being copyhold and leasehold. Freehold land is the nearest approach to absolute ownership that is recognized by the law. Such land cannot be held by a definite term of years as leasehold can, but must be for an indefinite term or in perpetuity. The owner of it is subject, therefore, to no dues except the ordinary rates and taxes. If he builds a house upon it he is the absolute owner of house and land.

In 1925 an Act was passed which provided for the abolition of copyhold and other antique tenures in England at the end of three years, and therefore for the establishment only of freehold and leasehold land-holding. *See* House; Land; Leasehold.

FREESIA. These greenhouse winter and spring-flowering bulbs are much admired for their delicate flowers and sweet scent. As they may be grown in small pots, they are suitable for small greenhouses and also for windows. Many people purchase fresh bulbs every year, but this is unnecessary if ripening and drying the bulbs is properly carried out. The bulbs should be potted in July or early August, putting about six in a 5 in. pot. One pot of freesias is enough for a room. The best soil is a compost of ⅔ loam and 1/6 each of sand and well-decayed cow manure. Cover the bulbs with ½ in. of this mixture. Place them in a cold frame and growth will be evident in a few weeks.



Freesia. Flowers and leaves of one of the new coloured varieties.

Keep the plants close to the light and water very lightly, increasing the quantity as growth develops. Hard forcing is not desirable. After flowering, water freely until the leaves turn yellow, decreasing the supply as the leaves die down. They are easily increased by offsets in August.

In recent years many charming new varieties in a wide range of colour have been raised. There are now mauve, heliotrope, crimson, rose and orange coloured freesias. Some of these later varieties are less fragrant than the old white and yellow ones.

FREESTONE: For Building. Any building stone that can be dressed easily or freely is called freestone; it is generally taken to be the most easily worked stone in a given district. The surface finish can be varied according to the tools employed, and the beds or joints are left rough to prevent slipping, and to provide grip for the mortar.

The principal varieties of freestone in common use are termed the quarry-faced, which is the natural face of the stone as it comes from the quarry; hammer-faced, with the lumps knocked off with a hammer; and chiselled, where the surface is rough and the marks of the tool irregular. When the surface is smoothed and finished it is known as tooled. Rusticated freestone is worked over with chisels in imitation of old and decayed stone, and is capable of producing a very pleasing surface if treated on broad lines and on large areas. *See* Stone.

FREE WHEEL. This is a device on a cycle by which a rider is enabled to keep the pedals stationary, thus allowing the machine to coast while at the same time a restful position is maintained on the saddle. Differing types are the ratchet, the roller, and the coaster hub, the latter being a combination of free wheel and back pedalling brake.

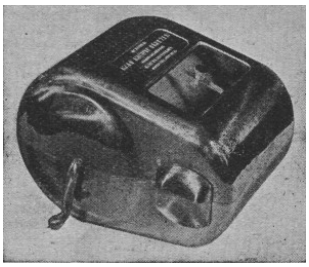
In the first mentioned type of free wheel, ratchet teeth are cut on the inner circumference of the chain ring, and a number of pawls are mounted flush on the outer circumference of the inner member, which latter is screwed on to the hub of the wheel. These pawls engage the faces of the ratchet teeth, thereby transmitting the drive from the chain ring of the wheel.

In the roller or wedge type of free wheel, the inner circumference of the chain ring is ground quite smooth. The rollers, usually five, are on the outer circumference of the inner member in recesses cut with an inclined face. When free wheeling the friction between the inner face of the chain ring and the rollers tends to push the latter towards the bottom of the inclined recesses, but when pedalling it tends to push the rollers up, and thus wedges the chain ring and the inner member as solid, thereby driving the wheel.

This result is attained because the distance between the inclined face and the inner face of the chain ring at its narrowest part is slightly less than the diameter of the rollers. It is usual to fit light springs behind the rollers to keep them in contact with both faces. As a general rule the chain ring runs on a double ring of balls, the races for which are formed on the inner faces of the cover plates and the faces of the chain ring.

The chief essential with all types is to ensure freedom of movement of the parts, and to this end the free wheel should be lubricated at intervals, say every 250 miles or so. It is advisable to wash out the free wheel occasionally with paraffin. To do this properly, lay the machine on its side and apply the paraffin while at the same time rotating the wheel, and keeping the pedals stationary. Leave the machine to drain, then oil the free wheel. *See* Bicycle; Coaster Hub.

FREEZER: For Ice Cream. There are many good makes of freezers. One type of small freezer requires about 5 lb. of ice to freeze a gallon of ice cream. In many ways the most satisfactory method is to use the freezing tray of the household refrigerator.





Freezer. Right, Rapid vacuum freezer. The ice cream compartment opens from the top and the salt and ice container from the bottom. Above, another type of freezer, handy for use at a picnic.

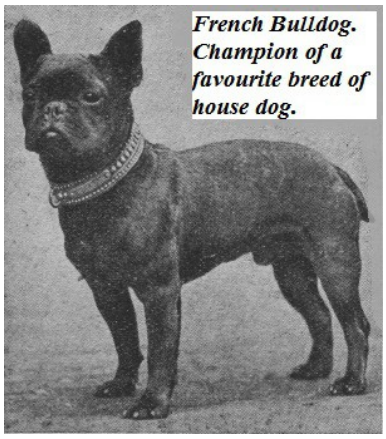
Vacuum freezers are also obtainable in which ice cream is made by two operations. The ice and freezing salt, in the proportion of three cups of crushed ice to one of salt, are inserted in the outer container after the freezer has been inverted. When this container is half full, pack the ice and salt well down, finish filling and then pour in a cup of cold water, clamp down the lid and reverse the container.

Ice cream is prepared according to instructions given with the freezer and poured into the smaller inner container and covered with a lid. The freezer is again inverted so that the ice and salt compartment is uppermost. Such vacuum freezers are obtainable in various sizes. *See* Ices; Refrigerator.

FRENCH BEAN: How to Cook. French beans should be used when very young, for they become tough and stringy when old. Wash the beans and top and tail them, them cut them lengthwise into thin strips resembling grass blades. Small ones need not be cut. Leave them in cold salted water till ready to cook. Put the beans in a saucepan of boiling salted water and boil very quickly with the lid off for at least 20 min. Drain, and shake them over the fire to dry them, add a small lump of butter and a little pepper and salt, and serve them very hot.

French beans can also be stewed. Put 1½ to 2 lb. into a greased casserole, leaving them whole if they are sufficiently tender, or slicing and stringing them if there are any signs of toughness. Cover them with 1 pint of white seasoned stock, then put the lid on the casserole and cook until tender. Drain the beans, taking them and the stock out of the casserole. In the casserole melt a lump of butter about the size of a hen's egg, afterwards mixing in a tablespoonful of flour. Then pour on the stock, stir the whole until it boils, and put in the beans. Heat thoroughly and serve in casserole. The cultivation of the beans is described in the article Bean (q.v.). *See* Bean Cutter; Diet.

FRENCH BULLDOG. A French bulldog differs so much from the British that one is unable to see the relationship between the two. The bat or upright ears, for instance, are the antithesis of those that are seen on the British national dog; the under-jaw does not project in the same manner, there is less wrinkle about the head, and in addition the chest is not so wide.



French Bulldog. Champion of a favourite breed of house dog.

Whatever may have been the case originally, the French breed is now distinct in build and temperament. He is quick and active, instead of being slow and lethargic, and he makes an excellent house pet, his average weight being from 20 lb. to 24 lb., though some are a trifle heavier. The favourite colour is brindle. The coat is short and smooth, the tail short and carried downward in bulldog fashion. *See* Bulldog; Dog.

FRENCH CHALK. This powder has a smooth soapy feel, and is used for sprinkling inside boots or gloves to make them slip on freely. In flat cake form it is used by tailors and dressmakers for making marks on dark cloth or other fabric.

The powder is also employed for absorbing grease from silk or other material, for which purpose it is sprinkled upon the grease spot and then ironed with a warm flat iron. It is used as an ingredient in dusting powders and for clearing turbid liquids. For the last-named purpose powdered French chalk is shaken up with the liquid, and the powder, in settling down, leaves it bright and clear. French chalk, alone or mixed with paraffin wax, is sprinkled over a floor to make it smooth for dancing.

FRENCH COOKERY. Genuine French cookery does not consist entirely of highly sauced and decorated dishes. It embraces the knowledge of combining flavours so that one does not unduly predominate. Garlic, for instance, should merely accentuate other flavours, and its actual presence should not be detected.

No waste is permitted and no portion from the boiling or stewing of the meat is thrown away. The liquor portion appears as a good brown soup, well flavoured with vegetable and thickened with sago, macaroni or some other similar substance, while the meat is thoroughly impregnated with the taste of vegetable, a little bacon, and a suspicion of spice and red pepper.

In French cookery the sauce always receives due consideration, containing in the stock from which it is made the essence of meat or fish which it is intended to accompany, and flavoured with herbs such as tarragon and chervil.

Dressed vegetables are a distinct feature of French cookery, and make a course by themselves. Cold vegetables are formed into salads, and with a mayonnaise sauce or salad dressing make relishes for cold meat. Salads of all kinds are popular with the French, but great stress is laid on the dressing. Almost any kind of salad herb is used in salads, with portions of meat or fish chopped up, and covered with mayonnaise sauce. *See* Casserole; Salad; Sauce.

FRENCH CRICKET. This is a game well adapted to small gardens. It is played by any number, without sides, and there is no scoring. Each batsman plays until he is out, and is then succeeded by the next.

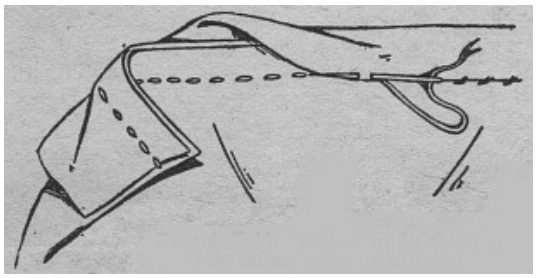
The wicket is represented by the batsman's feet and legs up to the knee. He stands with his feet together, the bat held vertically in front of him, and the first ball is bowled from a spot some few paces off. The batsman must not allow the ball to hit his feet, neither must he move them, or he is out. Any member of the field who stops the ball then bowls it from the spot at which he stopped it, but the batsman must not alter his position except in so much as he can without moving his feet. If the ball is caught by any player he is out.

FRENCH CURVE. The French curve is used in drawing and design work, and consists of a thin piece of pear wood, celluloid, vulcanite, or similar material, cut to a series of scientifically designed curved forms. Its use is of the utmost assistance to those who are unable to depend upon a free-hand drawing. The method of use, illustrated above, consists of laying the curve flat on the paper and marking around the edge with a pencil. French curves are sold separately or can be obtained in sets, and are made in a wide range of shapes. Almost any curve can be drawn by combining the various elements from different-shaped curves, but when doing this it is necessary to note if one curve flows freely into the other. As a guide, it is preferable to draw around a greater distance than that actually required for the operation, and then by trying the other curves it is possible to judge which of them is most suitable. The juncture of two curves should be indicated with a pencil-mark, so that when inking in the drawing the distance which should be drawn by the use of one curve will be apparent and the commencement of the other will be clearly defined. By these means the component curves may be prevented from having any suggestion of a sudden change of form or an ungraceful bulge. *See* Drawing.



French Curve. Device used by the draughtsman to enable him to dispense with free-hand drawing.

FRENCH FOLD. Raw edges may be finished by what is known as a French fold. This is a wide fold or bind enclosing the edge, turned over to the wrong side and slipstitched down. The strip for the fold may either be cut on the cross or on the straight, according to the shape of the edge to be bound. A French fold may be used to renovate worn or frayed hems, cuffs, etc., or to finish the sleeves and hem of a child's frock.



French Fold. Method of finishing or renovating edges of material.

A French fold may be 3 or 4 in. wide or a very narrow fold may be used, but if a narrow one is required a small rolled fold of material called a rouleau may be made. A strip should be cut on the cross about 1 in. wide and placed on the outer side of the material, edge to edge. Run a thread ¼ in. from the edges, turn over to the wrong side, leaving ¼ in. on the right side. Fold the remaining ½ in., turning it inside, and hem it neatly down. The four thicknesses of fold placed round the edge in this manner produce a good round edge, which is most useful in finishing off the edges of brocade, satin, crêpe-de-chine, and other similar materials, when it is impossible to use an ordinary hem.

Another type of French fold which is useful for the same purpose, and is employed to finish the edges of tunics, frills, etc., is called a French hem, and is made as follows: Run a small tuck on the wrong side of the material as far within the edge as is desired, then roll the tuck downward, turn the raw edge of the tunic up to meet it, and hem or slipstitch down to this.

FRENCH HONEYSUCKLE. This is a family of hardy perennial herbaceous plants known botanically as Hedysarum. The only species much grown is coronarium, or French honeysuckle. It has

divided leaves with oval leaflets, downy beneath, and spikes of crimson pea-like flowers in summer; height 3 to 4 ft.

The seed may be sown outside in April or May, and the plants put out in autumn where they are to bloom. They will thrive in almost any soil, but require a sunny position. Another species much used is multijugum, a shrub or sub-shrub growing 3 to 4 ft high. It flowers in July, bearing flowers purplish red in colour.

FRENCH MARIGOLD. A showy half hardy annual (Tagetes patula) which is raised from seeds sown under glass in slight warmth in February and March; the seedlings are planted out of doors in May. The dwarf varieties, 9 in., are popular edging plants. There are double and single French marigolds with yellow, orange, and reddish flowers. Legion of Honour, yellow and brown, is one of the chief favourites for edging. The tall varieties reach a height of 2 ft.



French Marigold. A favourite annual for the border.

FRENCH NAIL. This type of wire nail is in general use for rough work. It is circular in section, with a flat head, and is procurable in a wide range of lengths and in many different thicknesses. Sizes in common use range from ¾ in. to 6 in. long. The 1 in. size is particularly handy for fixing beaver and other building boards to the studding. The 3 in. size has many uses in the garden, such as nailing up fencing, while the larger sizes are of value in building construction. *See* Nail.

FRENCH POLISHING. This is a process by which a polish is produced on wood. The polish is a solution of gum resins or gums, and its composition varies. Shellac is always the main ingredient and alcohol the solvent. The simplest form of french polish consists of a solution of 6 oz. of shellac in a pint of spirit.

The surface to be treated must first be well coated with polish, and time must be allowed between the rubbings for the polish to settle and dry. At first the main object is to put a shell or covering of polish over the surface, whilst later a glaze is put on the surface thus obtained. It is useless to try and obtain a good polish on a surface insufficiently covered.

Make a polisher's pad by taking a piece of cotton wool and folding it into a firm pad the shape of an egg, with a point at one end. Cover this with a piece of old linen, not too fine, folding over the pad and gathering the ends up into the palm of the hand. Putt the point well out. Open the pad and pour in the polish from the back; it should never be used on the front. Press lightly on a board or palm of the hand in order to bring the polish through to the front of the pad.

On New Work. If the wood is rather porous, give it a coat of wood-filler before polishing. See that the surface to be polished is entirely free from dust. Cover the surface with polish by rubbing gently with the pad, using a circular motion. When the surface is covered, leave a little while to harden.

Should the surface be at all rough, it can be rubbed down with fine powdered pumice used on a rag, but no powder must be left on the surface when polishing is resumed. The pad is replenished with polish from time to time, always putting it in from the back. Continue working in a circular motion until the surface is well covered. If possible, leave it to harden for a short time after each rubbing.

It is usually necessary to body-in, as this process is called, three or four times, leaving a day between each coat. As soon as the work is tacky, leave it until dry otherwise the shell may be pulled off. Never stop in the middle of the work, as that may result in pulling up the polish. Rub down with pumice between each coat.

In finishing off, rub carefully with fine pumice and a drop of oil, working with grain of wood. Give a final coat of polish, using rather a dry pad, and leave to harden for several hours. Take a new piece of cotton wool, and on this pour a very little crystal glaze. Rub all over the object, using a circular motion, and when the pad is almost dry, rub hard until a very bright surface is obtained.

Repolishing Old Work. The instructions given above apply to the production of polish on new articles. An old piece of furniture such as the top of a dining-room table is repolished on somewhat similar lines. First mix a cupful of vinegar in a quart of boiling water. Dip a piece of flannel into this and quickly wash over the whole surface of the table to remove any grease. Rub dry and polish it well, using a soft cloth; then rub it down with a piece of sandpaper No. 0 or a rag dipped in pumice powder. If there are any holes or deep marks, fill them with stopping and leave it to dry. Rub down to make it even with the rest of the work, and colour with stain to match the wood.

Brown polish known as button polish is the best to use, as it works well and dries quickly and hard. It can be bought at any oil-shop. Make a pad as explained above, and fill it with the polish. Press on the palm of the hand and work in large circles until the whole surface is covered with figure 8 marks. Keep on going over and over the surface.

Should it feel tacky or inclined to pull up the polish, stop at once and put the job on one side. From time to time continue to body-in until there is a thick coat of polish all over the surface. For table-tops a thin coat is useless, as it will crack at once. Rub the surface over with pumice, but do not scratch it. If it requires more polish, go on bodying-in. Take care to remove all dust or grit.

Spiriting Off. This is one of the most difficult jobs for an amateur. It must be done gradually. In working in the polish sometimes a little oil is useful, but avoid using too much, as it smears, and is difficult to get rid of. As the pad needs replenishing, use methylated spirit instead of polish, always putting it in from the back, and employing 1 or 2 drops at a time. Rub a little harder than before, but always in circles or figure 8. When only spirit remains in the pad, if the surface is not sticky, take a clean pad, put a drop of methylated spirit or crystal glaze into it, and rub hard up and down until all smears disappear and the result is a brilliant polish.

Work should be done as far as possible in a warm room. Leave it for 24 hours, and if it has gone dull rub it well again. *See* Furniture; Sideboard; Table, etc.

FRENCH SEAM. As it ensures absolute neatness on both the outer and inner sides of a garment, a French seam is widely used, generally on lighter weight materials, in making lingerie, children's frocks, blouses, etc. It may vary from ⅛ to ¼ in. in width, according to the material.

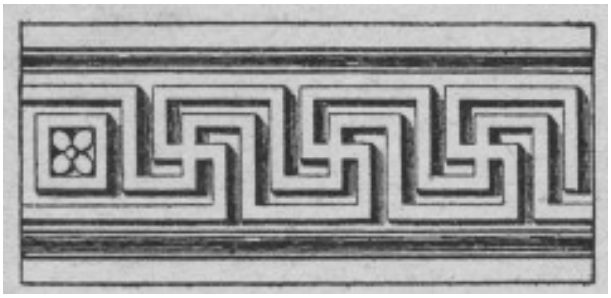
A French seam is made by taking the two edges of material to be joined and running a thread on the right side as near the edges as possible, avoiding any chance of fraying. Neaten the edges with a sharp pair of scissors, and turn over to the wrong side. Take the join firmly between the thumb and first finger of both hands and press it down. Run a tacking thread through the pieces of material, far enough from the join to enclose the edges left on the right side, before finally finishing the seam by a machine stitch or running thread.

FRENCH WINDOW. For a drawing room, or any other room looking on to a garden or a conservatory, French casement windows extending to the floor level are sometimes preferred. It is essential that they should be exceptionally well-fitting, otherwise the room will be draughty and cold, and they should never be fitted to rooms with a north or north-east aspect. None but thoroughly seasoned wood should be used for the frames of a French window.

It is advisable to make the two casements to open outward. They should be hinged to solid frames, and fitted with rebates in the frames, at the top and bottom as well as the sides, so that they can close tight against each other and against the surrounding framework. To prevent rain or wind from entering it may be necessary to run a strip of rubber down the centre where the casements meet, on the inside. The problem of ventilation can be solved when the room is fairly lofty by an upper casement hinged horizontally to the top of the main framework and working independently of the vertical casements enclosed by their own frame.

There should be bolts at the top and bottom of one casement and a solid sash-fastening on the other in order to secure it thoroughly. *See* Bolt; Casement; Curtains; Window.

FRET. This name is given to any geometrical ornament cut or painted on a flat surface in or on a building. Its most familiar form is the key pattern, derived from the Greeks, which consists of a series of narrow bands set at right angles to one another, so as to form a consecutive geometrical design. There are several variations of this pattern, such as the diamond fret, in which the lines are set diagonally to the top and bottom boundary lines of the decorated space. Fretwork is frequently employed on the outer stonework of buildings where it is desired to relieve the harshness of a bare flat surface. The name fret is also used for the metal plate which closes the opening below a grate. It is often pierced.

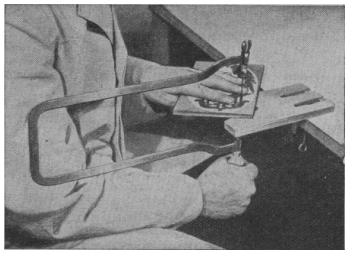


Fret. Variation of Greek key pattern for ornamenting a building.

FRETWORK: A DECORATIVE HANDICRAFT
Practical Advice on Tools, Materials and Designs

The reader may further be referred to the entries Antofret; Cabinet Making; Chippendale, etc. also to those on the various woods used, e.g. Oak; Sycamore; Walnut.

The term fretwork now has a meaning rather different from that current a few years ago. In place of the elaborate models that were then popular, we have a simpler style in which utility has first consideration. In addition, fretwork has a wider and more important application, owing to the growing popularity of the fret in furniture, and the development of wireless receivers and gramophones, both of which use a fret. Thus the fret has become a decorative motif rather than an end in itself.



Fretwork. Fig. 1. How the fretsaw should be held.



Tension device for tightening the blade.

The Tools Required. The most important tool is the fretsaw frame (Fig. 1). The 16-in. size is recommended, as it is sufficiently large to saw wide pieces of wood without being too heavy. Some form of tension device is an advantage, such as that shown. In regard to the saw blade itself, the No. 2 is suitable for general purposes. Thicker saws than this are used for coarser work, where speed in cutting is desired rather than a fine finish. Smaller saws come in for very thin wood, but are not recommended for ordinary use as they are rather more difficult to control.

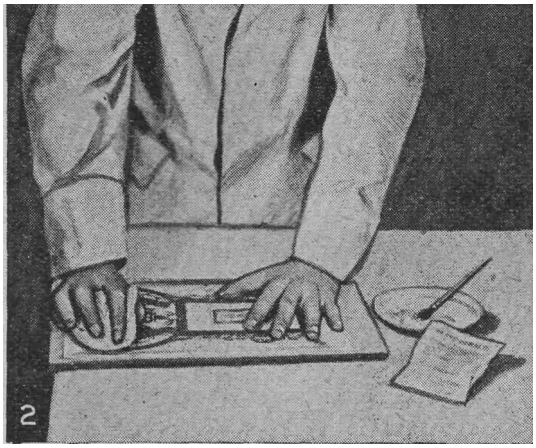
An Archimedean drill is used to pierce holes through which the saw can be passed to saw internal frets. Some drills are provided with flyweights to give momentum and facilitate easy running. The actual bit should be a trifle larger than the width of the saw being used. A cutting board will be needed. The wooden one is suggested, as this will not cause any damage to the saw should the latter be run against it. A board 8 in. by 4½ in. is convenient for most purposes. It is held to the table with two small thumbscrews. A glasspaper block is used to clean off the design after the cutting has been completed. This is made of steel and has a flat face covered with a piece of flexible material, to enable it to give to any small inequality in the surface. A set of files is needed to enable the work to be trued up after cutting. These tools are the essential ones. There are others, such as the rule, light hammer, plane, and so forth, which can be obtained as the necessity for them arises.

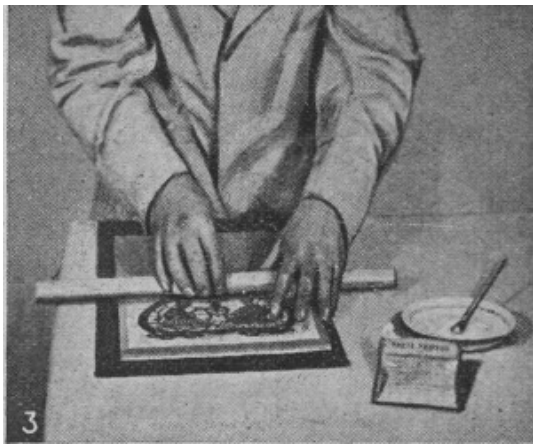
Materials. The wood used in fretwork should be obtained ready planed and glass papered. Such wood has already been brought to even thickness, an important point, because it is essential that joints should fit accurately. Designs are prepared specially to suit standard thicknesses of wood, so that only standard material should be purchased, for preference. Satin walnut is largely used, since it is comparatively cheap, is obtainable in wide widths, and is close in the grain. Oak and mahogany are also employed for better-class designs.

A material which has come to the front in recent years is plywood. This is made up of three or more layers, the centre one running at right angles with those at each side. Owing to this feature plywood is practically as strong in its width as it is in its length, a particular advantage in certain frets because of the rigidity it gives. One drawback is that plywood shows the layers at the edge, but for certain types of work this does not matter. Wireless and gramophone frets should as a rule be cut in plywood; a thickness of 3/16 in. is usually convenient. Decorative frets as applied to furniture can be cut in 1/32 in. or 1/16 in. plywood. As these are stained and polished the layers at the edge do not show.

Designs. For ordinary fretwork models finished designs are obtainable from various suppliers. These are printed full size and require simply to be stuck down on to the wood and the outline cut. In some cases, the home worker may like to prepare his own designs, particularly for frets to be applied to furniture, etc. A convenient method is to use squared paper. A portion of the design (perhaps a quarter, or, in some cases, one-half), can be drawn full size, and the position of the other parts mapped with the assistance of the squares. Tracing paper may be used for copying designs or motifs.

Pasting Down. The design, however obtained, has to be applied to the wood to enable the cutting to be done. For this purpose paste should be used in preference to glue, since the latter grips the paper too strongly, making it difficult afterwards to peel off the design. The wood should be pasted rather than the design, because in the latter case the moisture is apt to stretch the paper and so distort the design. A clean cloth rubber should be used to make the design lie flat, working it from centre outwards so that any air bubbles are pushed towards the edges. Fig. 2 shows the process.



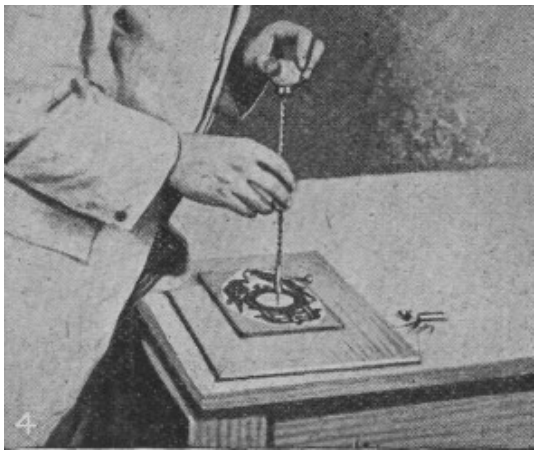


Fretwork. Fig. 2. Use of rubber in laying a design. Fig. 3. Laying a large design with the help of a dowel rod.

Large designs are sometimes a little difficult to handle. In this case the method shown in Fig. 3 can be adopted. Here the design is rolled round a piece of

dowel, and the fretwood pasted. By placing the dowel at the top it can be rolled forward and the design unrolled. The latter will then lie flat on the wood. This method prevents distortion. Allow the paper to dry thoroughly before beginning the cutting.

Drilling. This operation is closely connected with the actual cutting, for the latter depends in a great measure on where the holes are drilled. As a general rule it can be taken that holes should be made near to some projecting piece of ornament, as the saw is usually started at such places. It is not advisable to start the saw at the mid-point of a curve, as when later on the join is made a disconnected appearance usually results. In some cases such a start is unavoidable, for instance, in a circle; the hole in this case is made near the line and the saw carefully taken into the circle in a continuous sweep. Small imperfections of outline can be corrected with the file.



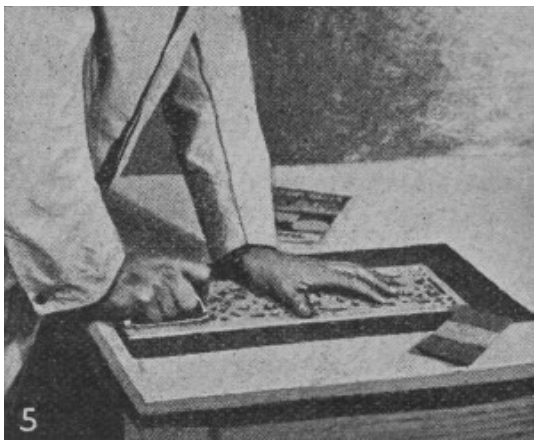


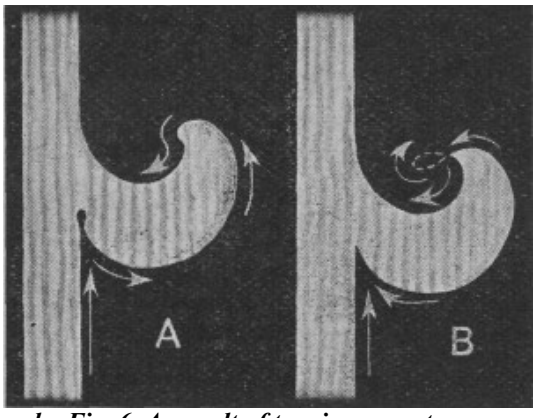
Fig. 4. Use of the Archimedean drill for piercing holes. Fig. 5. How the glasspaper block is held when cleaning up the finished work.

Fig. 4 shows the Archimedean drill in use. Note that the wood lies on a flat board; when so supported the drill is not liable to split out the grain when it emerges at the underside. If laid on a table with a rough and uneven top, a small depression in the latter might cause the grain to break away as the drill comes through.

The drill shown has flyweights, which keep the tool rotating whilst the upward stroke with the bobbin is made.

Using the Fretsaw. It is most important to hold the saw upright, a facility which comes only with practice. The work should be examined after it has been cut and any inaccuracies carefully noted. Never attempt to force the saw into the wood; it only results in a broken blade. Keep it working steadily up and down by its own weight. It will then cut quite quickly enough and truly.

When a corner has to be turned the saw should be moved up and down without the slightest forward movement, and should be turned gradually whilst in this position. It will be found that the blade will gradually turn in the required direction. It is better, however, to avoid turning in the corner, because it is liable to rob the design of its sharpness *(see* Fig. 6, A). The illustration shows the unsightly gap at the corner made by the turn. A similar thing has occurred at the point of the leaf, where the outline has become dull and rounded. A better method is shown at Fig. 6, B, where the saw is taken into the corner first along one side and then along the other. In this method the two cuts meet and leave a perfectly sharp corner. At the external corner the saw is taken along one side past the corner. It then describes a little loop and comes back along the other side.



Fretwork. Fig. 6. A, result of turning saw at corners. B, better method, corners being left sharp and clean.

A point to bear in mind in all designs is the continuity of line. Where two members of a pattern cross one another, they should appear actually to do so. The eye automatically puts in the joining lines between them. In the same way where one member branches out from another in a continuous curve, the line should be sweeping and continuous. This should be noted especially by fretworkers who prepare their own designs.

Finishing Off. If the paste has been used sparingly, it is usually a simple matter to peel off the design. If it shows some resistance, however, it can be damped slightly, using the water sparingly. On no account allow the edges of the work to become wet, as this is liable to raise the grain, which is difficult to smooth afterwards. After the paper has been peeled off as cleanly as possible the whole surface should be cleaned up with glasspaper, using the glasspaper block (Fig. 5). The work should be held down on a flat board during the process. If laid on the bench, any inequality in the

surface of the latter might cause part of the design to stand up, and so catch the block, resulting possibly in a breakage. Quite small pieces of design can be treated in a different manner. The glasspaper itself can be laid on a flat board and the design rubbed upon it.

No finish such as polish or paint should be applied to ordinary fretwork models. It only chokes up the edges. Certain designs are somewhat different because they have no elaborate internal fret. They are comparatively plain, and are intended to be lacquered or painted. Frets to be applied to furniture are also in a different category. These are polished with the rest of the job after they have been applied.

Sometimes a file has to be used for fretwork. Filing, however, should be regarded as a last resource, and on no account should the fretting be done carelessly, with the idea of cleaning it up afterwards with the file. This is simply a waste of time. A legitimate use of the file is in fitting joints. It happens frequently that the design stretches slightly when being laid, with the result that the joints do not fit properly. A few rubs of the file soon put this right.

Assembling Fretwork. In a large number of cases glue is used, the most convenient form being the liquid kind in tubes. The nozzle is applied to the join and a little glue squeezed out. When the fret is to be applied to furniture care must be taken not to allow the glue to exude at the edges, because it is difficult to remove cleanly and looks unsightly. A good method is to squeeze out the glue on to a flat board, rubbing it with the fingers to spread it evenly. The fret is placed on this and rubbed up and down so that the back is covered with glue. It can then be placed in position and held down by a flat, weighted board. When necessary to use nails in fretwork it is advisable to drill holes first, unless the nails are very small.

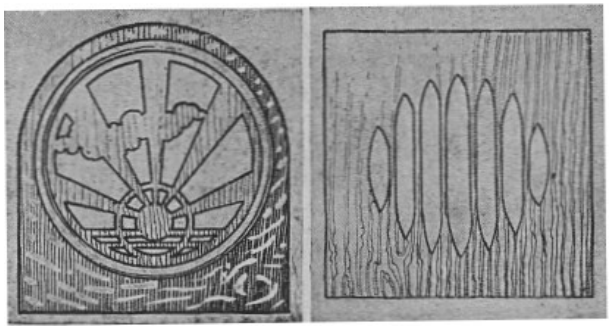


Fig. 7. Designs for frets particularly suitable for loud-speakers or gramophone cabinets.

Types of Designs. It does not follow that because a design is elaborate it is therefore difficult to cut. In fact, the reverse is often the case, the very intricacy of the pattern hiding any small inaccuracies. The most difficult type of design is that which is built up on a geometrical formation, such as the circle, square, and so on. The eye readily detects any defects in regular shapes, and the smallest inaccuracy is at once apparent in a circle, for example, whereas in intricate floral or leaf work small errors would pass unnoticed. The beginner is advised to choose comparatively simple designs which are not geometrical in form, and which have no very thin members. Some suggestions for loud-speaker or gramophone frets are given in Fig. 7. As a rule the simpler these are the better. There should be plenty of openings to allow the sound to emerge. Such frets should be cut in 3/16 in. plywood.



Fretwork. Fig. 8. Effective decoration of furniture with applied frets.

An imitation of carved work can be obtained by the use of fretwork (Fig. 9). Suitable patterns are those often seen on Jacobean furniture, consisting mostly of interlacing strapwork designs. The design is drawn out in the usual way on paper, and pasted on the wood. The thickness of the wood used depends upon the relief required for the imitation carving. Usually ⅛ in. or 3/16 in. is about right. The outline being cut, the whole is glued down to the background of the work. To make the effect still more realistic the background in the internal spaces of the frets is given a roughened finish by means of a punch. This does away to a great extent with the appearance of an overlay, and makes the work simulate real carving. The applied fret itself can be carved here and there. For instance, in dealing with interlacing straps certain of the members can be made to appear as if they were beneath others, by just sinking such parts where others cross. The grain of the applied fret must run in the same direction as that of the groundwork.

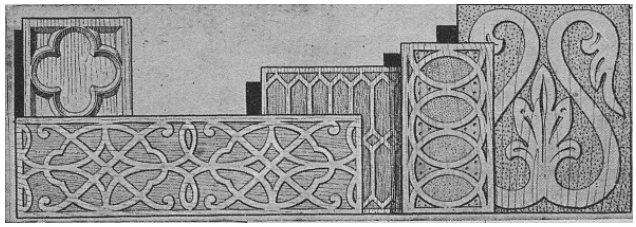


Fig. 9. Designs showing how carved work may be imitated by the use of a fretcut overlay.

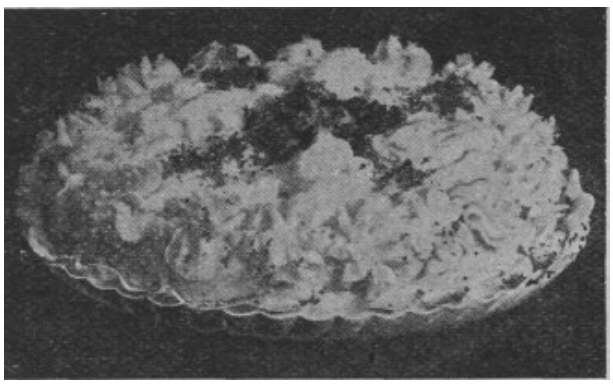
Erinoid and Xylonite. These substances are somewhat tougher than wood, and a special metal-cutting saw should be used for them. One great advantage of using this type of material is that the surface can be modelled to a certain extent after the cutting has been completed. The job is finished off with glass-paper and a file, and the surface polished with fine pumice powder. Such things as paper knives and small frames can be made from erinoid or ebonite.

FRIAR'S BALSAM. This is another name for the compound tincture of benzoin. The dose is a ½ to 1 fluid dram. Friar's balsam is much used in lung diseases, especially consumption and chronic bronchitis, for its disinfecting action. It has a stimulating effect on the lung tissues. When used as an inhalation, a teaspoonful of the balsam is added to a pint of very hot, but not boiling, water, and the resulting vapour is inhaled. It is a useful dressing for wounds, as it is an efficient antiseptic and also tends to check bleeding. Used in the proportion of one part of balsam to ten parts of water, it also forms a soothing application for cracked lips and rough skin.

Fricandeau. A popular dish made from fillet of veal is known by this name. *See* Veal.

FRICASSÉE. This is a type of stew, generally white, consisting of meat, game or fish cut into pieces and cooked in sauce.

Chicken Fricassée. A fricassée can be made with half a cold boiled chicken. Take the meat from the bones, and put the latter, together with a small onion, into a pan with the liquor in which the chicken was cooked. Cook them well for an hour or more, then strain off the stock. Melt 1 oz. butter in a pan and stir in 1 oz. flour. Add enough stock to make a thick sauce, put in the pieces of chicken and simmer them gently for 30 min. Mix the yolk of an egg with a gill of milk or 3 tablespoonfuls of cream, and add this gradually to the contents of the saucepan. Stir in a teaspoonful of chopped parsley, a little lemon juice, and seasoning to taste. Serve on a hot dish garnished with sprigs of parsley and slices of lemon.



Fricassée. Breakfast dish made from any white fish.

Fish Fricassée. Any white fish, cooked or uncooked, may be employed in making a fricassée. To do this, break ¾ lb. fish into flakes and prepare a sauce with 1½ gills milk, a lump of butter slightly larger than a hen's egg, 1 ½ oz. flour, and ¾ pint fish stock. Season this to taste, then add the fish and heat the whole thoroughly, allowing it to cook for a few minutes if the fish is raw. A squeeze of lemon juice may be added just before serving, and a border of potato, together with a little chopped parsley, used as a garnish. *See* illus.

Rabbit Fricassée. A brown fricassée of rabbit can be made thus: Take out the inside, cut off the head, and remove the eyes. Wash the head, liver, and heart in cold water, soak them in cold salted water for 15 min., and then put them into a saucepan with a peeled onion and a quart or more of water or stock. Bring them to the boil, remove the scum, add seasoning to taste, and then simmer for 2-3 hours.

Cut the rabbit into joints, wash and dry them, and in the meantime put six rashers of streaky bacon into a saucepan and fry them gently until the fat looks transparent. Then put them on a plate, and to the pan in which they were cooked add ¼ lb. dripping. When this is smoking hot, coat the joints of rabbit with flour, and put them in two or three at a time, frying them untin golden brown. Then take them out and keep them hot with the bacon, fry a sliced onion in the fat, stir in one or two dessertspoonfuls of flour, and let it brown. Skim and strain off about 1½ pints of the stock, add this to the flour, and bring the whole to the boil, keeping it well stirred.

Add a few drops of browning and more seasoning if necessary, put back the rabbit, together with the head, liver, and heart, and cook all gently for 1½ to 2 hours. Add the bacon about 15 min. before serving. The rabbit should be piled in the centre of a hot dish, with the bacon on top and the gravy poured round. Dice of cooked carrots may be used as a garnish. *See* Oyster; Sweetbread.

FRIENDLY SOCIETY. These societies exist for the purpose of enabling persons to insure their lives, to provide funeral expenses or endowments; and to make provision for sickness, unemployment, old age, and various other contingencies.

Two Types of Society. Their original constitution and scope have been greatly altered by law and changing industrial conditions, and they now may be classified into two groups, the fraternal orders, such as the Manchester Unity of Oddfellows, and the collecting societies, such as the Liverpool Victoria. The organization of the fraternal orders is to a large extent dependent upon voluntary labour. On the other hand, collecting societies employ paid collectors, who usually call every week upon members for their contributions.

The conditions of membership vary according to the rules of the particular society. Members can insure

death benefits for any sum not exceeding £300, but the sum assured in respect of children is limited by statute to £6 in case of children under 3 years of age, to £10 for children under 6 years of age, and to £15 for children up to 10.

One advantage of membership is the ability to dispose of any sum payable at death, not exceeding £100, by means of a written nomination, which must be registered at the head office of the society. Other benefits obtainable from friendly societies include relief or maintenance during widowhood or distressed circumstances; when travelling in search of employment; or in such circumstances as shipwreck or damage to boats or fishing nets.

Members can also provide, again by weekly payments, for the old age, i.e. any age after 50, and for the sickness, widowhood, orphanage, and old age of their dependents. Other forms of insurance secure the member against loss by fire, up to the value of £15 of the tools used by him at his work.

A member, in addition to his own life assurance, may insure funeral expenses for husband, wife, or child, and in respect of a parent, grandparent, grandchild, brother or sister. Endowments and endowment assurances, subject to limitations laid down by law, can also be effected at varying rates. As ordinary friendly societies have no shareholders, any profits accruing from successful management are distributed amongst the society's members.

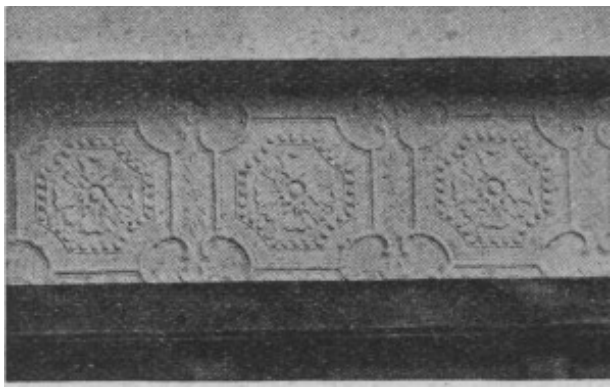
Persons who take out a policy from a friendly society should carefully examine the conditions and not sign until they are satisfied. If they are unable, for any reason, to maintain their payments, they are entitled by law to receive some equivalent for the money they have already paid by premiums. *See* Insurance.

FRIEZE: In Decoration. This band of plain or decorated space below the cornice is frequently used in a high room with good result. It has a lightening effect when of plaster washed in a pale colour above a dark wallpaper or panelling, and is therefore largely employed in timbered halls and living-rooms. Should a frieze be liked in a low-ceilinged room to give interest to distempered or plain papered walls, a motif frieze can be applied were required.

For friezes surmounting wood panelling some form of relief is popular. This may be either plaster or imitation plaster. As regards the first, exactly the same remarks apply to the frieze as to the ornamental plaster-work of a ceiling. That is to say, the original design is modelled by an artist or from his drawing, a mould is taken, and the result is reproduced as often as may be desired. The slabs or lengths of frieze are transferred from the place of manufacture to the room, and fixed in position on the wall by the same method as ceiling sections.

Imitation plaster friezes in fairly high relief, made of wood-pulp, papier mâché, or asbestos, are also made in sections or panels, and can be obtained from paper manufacturers. They are applied like wallpapers. Relief motifs are obtainable separately, which can be placed on a plain surface as desired. *(See* Hall.) In heraldic designs these are particularly suitable for oak panelled rooms. It is necessary to bear in mind that small rooms will not stand too high a relief.

An effective frieze for an ordinary room can be made with any good washable distemper. A frieze banding may be used to separate this plain frieze from the wallpaper. Bandings should repeat a definite colour note in the loom, such as the fireplace tiles or the ground of the carpet.



Frieze. Fig. 1. Frieze for hall or dining room. It is in relief plaster work, distempered pale buff, and surmounts oak panelling.

Before distempering the frieze care should be taken to see that the underlying plaster surface is good; any holes should be stopped with plaster of Paris, finished off with a trowel, and, if necessary, with pumice stone. On a really smooth surface one coat of the distemper will suffice for a plain frieze in any colour that may be desired. Such colour usually matches the ceiling. In certain cottage rooms nothing looks better than a simple frieze washed with deep cream colour. If the plaster work is roughed up before being coloured the frieze is more effective for an oak beamed room.

Stencilled Friezes. These are often seen in nursery decoration. With this type of frieze, having chosen the design of nursery rhyme, fairy tale characters or attractive animals, the amateur decorator proceeds to trace it with a blue or red pencil on a sheet of stiff oil paper. This is then affixed to a smooth board and the traced pattern cut out with a sharp penknife. If the pattern is so intricate that the sheet after this operation will not hold together, parts of it can be left uncut, these being subsequently filled in with a brush on the wall surface. The oil paper pattern is fastened in position on the wall with drawing pins and the colour, either distemper or oil, brushed over it. The pattern is moved on to the next space to be decorated, and the process repeated until the entire frieze is finished. Unless this is only partially to be decorated at definitely appointed places, the design selected should be one that fits the spaces to be covered on each wall, and careful preliminary measurements should be made. The design itself should be easily contained in the centre of the oil paper, so that its repetition will be practically mechanical, without the necessity of any further measuring. Stencil designs can be obtained which can

be traced and adjusted on to the oil paper. Charming nursery friezes are also designed by good wallpaper firms. The frieze illustrated in Fig. 2 is made very deep so that its details are easily seen by small children. Surmounting a dado of "black board" it has an added charm for the day nursery. In the modern room decoration is often cut out and applied on a frieze where interest is required and not necessarily all round the room. For instance, a group of figures or a flight of birds will be placed over the fireplace, and perhaps at two corners of the room only. The designs of these groups vary according to the decorative shape required by the space. *See* Anaglypta; Colour; Cornice; Stencilling; Wallpaper.



Frieze. Fig. 2. Frieze of colour prints for a nursery. It is very deep so that the detail is easily seen by children, and surmounts a blackboard dado.

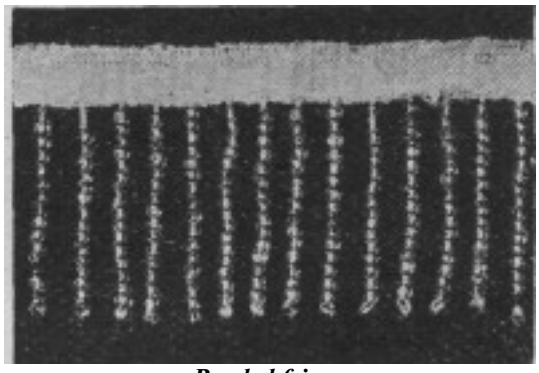
FRIEZE: The Material. As originally made centuries ago friezes were coarse woollen cloths rendered blanket-like by roughening the surface with wire brushes. A rough face is still a feature of most friezes, which are cloths too heavy for suits, but excellent for overcoats for motoring.

Irish friezes are appreciated for their thickness. The cloth is heavily fulled after being woven, and it becomes so dense that wind does not blow through.

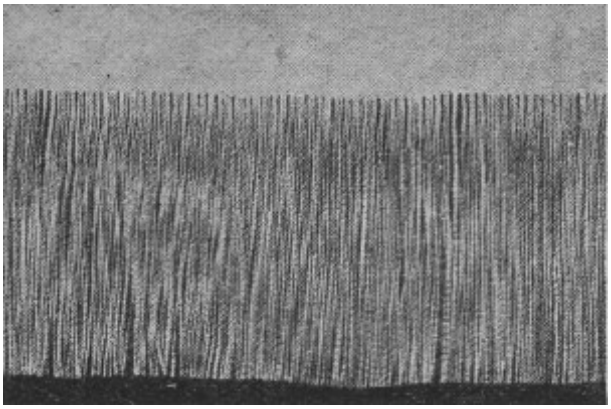
FRILL. This is made of a strip of material cut any width, single or double, the upper edge gathered or pleated on to a garment or band, and the lower edge finished in some way and left to hang loose. Frills in heavier materials are usually cut on the cross and finished with a picot edge or with a bind.

Lace, net, georgette, ninon or any silk or light cotton material may be used for frilling. The lower edge of the frill may be trimmed in many different ways; a hemstitched border is sometimes used, or a tiny rolled hem or scalloped bind may neaten the edge. Frilling — both plain and pleated—in various colours and materials can be purchased by the yard. The pleated kind is the least practical because the pleats lose their shape when washed.

FRINGE: Uses in Furnishing. While fringes for dress are a matter of seasonal fashion, these trimmings have a definite place in decorative furnishing. As period trimmings they belong to the 16th and 17th centuries and the first decade of the 18th century and were greatly used until the reign of Queen Anne for enriching cushions, hangings and upholstery. During the Georgian periods they were not much employed, but appeared again in Victorian times, and are extensively used to-day both as correct period and as modern trimmings for cushions, curtains and pelmets, bedspreads, stools, pouffes and lampshades.



Beaded fringe.



Fringe made by fraying ends of ribbon, linen, etc.

Fringes look particularly well with Jacobean style chairs, upholstered in green, brown or maroon velvet and further embellished with heavy cords and tassels. Metal fringes were first introduced into England in the reign ot Charles II, but straight silk fringes were much employed in the Tudor period, and variegated fringes were seen in early Stuart days. Such trimmings are therefore correct for the settee and chair with twisted oak frame, or for stools and chairs with X legs reproduced from the Tudor style, for William and Mary stools and armchairs with stretchers and turned legs, but seldom for the later 18th century pieces with

cabriole legs, when fringe would have detracted from the embroidered seats then in vogue. Tufted fringe was used on William and Mary chairs. It was secured by small buttons edged with silver wire and trimmed velvet upholstery. As trimmings for candle-shades for use with electric light sconces silk fringes are often employed, and lampshades may be composed of silk fringe shading from pale yellow to orange or from flesh pink to deep rose, sewn in wavy lines on a silk foundation.

Fringes can be bought by the yard in various colours and widths from all drapery stores, and are applied by means of a band which confines the top ends of the fringe. Fringing may also be made on the material itself. When this is done the depth of the fringe must first be decided, and a line of machine-stitching run at that distance from the edge. All the threads parallel with this line must then be pulled out with a needle or pin until the actual stitching is reached. The machine-stitching is not essential, but it helps to prevent the material from fraying. A beaded fringe can be made by cutting a number of threads of even length and threading each of them with the same number of beads. Fasten off the bottom end securely, knotting it so that the beads cannot fall off. The lengths should then be applied at regular intervals to the edge of a lampshade, or other article to be so adorned, or may be sewn to a narrow braid first and then applied. See Bead; Curtain; Lampshade.

FRITILLARY. The most striking of these is Fritillaria imperialis, the crown imperial, which in spring bears drooping yellow or reddish flowers on stout stems 2 feet or so high. The bulbs should be planted 6 inches deep in autumn and left undisturbed for years. The snake's head fritillary (meleagris) 8-12 inches, has beautifully chequered blooms in purple, white and other shades of colour in spring: it flourishes in grass or in the rock garden. Aurea and citrina, with yellow flowers, are two pretty fritillaries for sandy loamy soil in the rock garden. Propagation is by seeds sown as soon as they are ripe or by offsets.

FRITTER. Fruit, meat, fish, cheese, eggs, or bread can all be employed to make fritters. Fresh fruit can be used, but meat or fish should be already cooked. Remains of cold meat or fish can be successfully re-heated in this way. Hard-boiled eggs should be sliced rather thickly. A good frying batter should be made, and slices of the fruit, meat, eggs etc., dipped into it, then dropped into a pan of very hot, deep fat and fried a golden brown. *See* Apple Fritters; Batter; Bread Fritters; Cheese Fritter; Cold Meat; Frying; Orange Fritter.

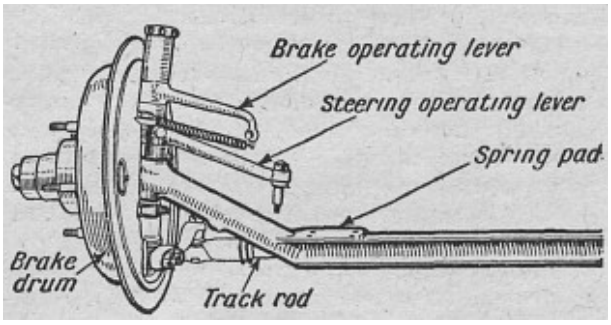
FROG: Its Garden Utility. The frog should always be welcomed in the garden, and introduced there if he does not come of his own accord. He never touches leaf or flower in the way of food: but in addition to a prodigious consumption of insects of all kinds, he also destroys slugs and earthworms. His soft skin of yellow and brown must be kept moist, and to keep him in a healthy condition and active it is worth while providing for his comfort by having a patch of long grass in a shady corner of the garden, with a sunk pan of water near by, in which he can soak at intervals.

The frog and the toad are quite easily distinguished. In addition to its brighter and varied colour, the frog is more angular, has longer legs, and the moist skin is perfectly smooth. The toad has a rounded outline, is more portly, and the dry, warty skin is of one dark tint, without spots or bands.

FROGHOPPER. Under this popular name are included a number of insects allied to the plant-bugs and aphis, and, like them, subsisting by sucking the juices of plants. The familiar and conspicuous cuckoo spit is formed of surplus fluid, exuded by the immature froghopper and whipped into a froth to protect its tender body. If the froth is blown aside the yellow insect will be seen. In the mature stage it uses its hinder pair of legs for making prodigious leaps, and as a rule escapes capture.

In the earlier stages the insect inflicts great damage on many plants, particularly noticeable on carnations and pinks. Washing with insecticides, such as a solution of nicotine and soft soap in water, is recommended; but the most certain method is to look for the cuckoo-spit and then destroy the insect by pressure of finger and thumb. *See* Insecticide.

FRONT AXLE: Of a Motor Car. The front wheels of a car rotate on stub axles which are connected by more, or less vertical pivots to the ends of a fixed or dead—i.e. non-rotating—axle secured to the springs. The axle, in addition to transmitting the weight of the vehicle from the springs to the wheels, has to resist the torque or turning effort imparted to it when the brakes are applied. This torque tends to twist the end parts of the axle, and the circular section now generally adopted for the ends between the spring pad and the stub axle is best adapted to resist such forces. The diagram shows a front axle of the dropped type.



Front Axle of a Motor Car. Diagram showing a front axle of the dropped type.

FROST. During the winter months the householder has to guard against the action of frost. Should no precaution be taken water is liable to freeze in the pipes, especially during the night, the water supply

may be cut off, and burst pipes will add to the inconvenience. Except when the frost is unusually severe these troubles can generally be prevented by wrapping straw, felt, sacking, or some other material round the pipes, and keeping an oil-stove or other heating apparatus in any room where pipes are exposed to the cold.

Protecting a Pipe. External water pipes should be protected with a generous wrapping of straw or felt. An effective method is to box them in with a wooden casing and pack it with straw or hay. An important part to watch is the overflow pipe, which protrudes a few inches from the wall and is very often forgotten. Should it freeze, surplus water cannot get away and flooding may result.

In frosty weather it is as well to shut off the main water supply each evening and to drain the system. The drinking water should come off the rising main, and the supply for the bath, w.c.'s and hot water apparatus is from a storage tank in the roof, fed by the rising main. Usually in addition to the pipe from tank to bath, lavatory basin, etc., there is a separate pipe running to the hot water tank, each having a stop-cock near the cold tank. It may be well temporarily to shut off the bath and w.c. supply when a bad frost is expected, draining the pipes by opening a tap at bath or lavatory basin. The w.c. should be flushed last thing at night, when the flushing cistern will remain empty till the stop-cock at the storage tank is opened again the following morning. If the w.c. water comes from the rising main the supply will have been cut off when the main stop-cock was turned off.

The Hot Water System

The fire in the kitchener or independent hot water boiler should be banked up at night. Since the cold supply to hot water system has not been shut off, the circulation in the latter will not be interfered with unless the cold water tank freezes. The rising main having been shut off, the cold tank cannot refill, of course, so little or no water should be drawn from the hot supply taps in the circumstances.

If the pipes of the hot water system freeze, as evidenced by the water ceasing to flow from the hot taps, the fire in range or boiler must on no account be lighted until the thaw comes. The water must run quite freely and continuously before it is safe to use the boiler.

The householder should make himself familiar in advance with the run of the pipes and the position of the stop-cocks, so that in emergency he can shut off the main supply at the hydrant box usually situated in the forecourt, or at the additional stop-cock which should be provided inside the house. The latter is a great convenience when fitting a new washer to a leaky tap, etc. A long-handled key will be needed for the outside stop-cock, which is on the pipe usually some two or three feet underground. This should be obtained and placed in a readily accessible position. When shutting off the main supply in frosty weather it is preferable to use the outside stop-cock, as then the whole of the service pipe can be emptied, and there is no water left in the pipe to freeze. Reference should be made to the diagram given in the article Water Supply.

Should it be impracticable to shut off the main supply to a storage tank or flushing cistern it is desired to empty, the ball-cock may be tied up with string, the latter being fastened to a rafter or to a stick laid across the open top of the tank or cistern. Should there be no stop-cock on the distributing pipe from a tank, it may be possible to plug the outlet with a piece of broomstick having a tapered end.

Dealing with a Burst Pipe. When pipes freeze there is always a likelihood of a burst somewhere in the system, and this may not show itself until the thaw. If the burst pipe forms part of the distributing system from the storage tank the appropriate stop-cock near the tank must be turned off. Failing this the taps on the system should be opened to empty the tank as quickly as possible, and the stop-cock on the rising main must be turned off, of course. In emergency the pipe at the burst (on the supply side) may be hammered flat, but this makes subsequent repair more difficult and expensive, as a section of the pipe will have to be cut out and replaced. However, to prevent a flood this measure may be justified. When the pipe has been flattened it should be cut through and the end bent over and hammered tight at the end.

During a spell of severe frosty weather, if the bedrooms of the house are cold or the habit is to sleep with the windows open, a good plan is to remove the water from the basins, jugs or water bottles for the night, as if these freeze they are liable to crack.

Frost in the Garden. One of the greatest benefits of frost from the gardener's point of view is the purification and pulverisation of land which follows the freezing of the soil where autumn digging has not been shirked. Frost penetrates and disintegrates the close particles of heavy clods, reducing them to that friable condition so much desired when sowing and planting time comes round, and destroying the pupae of pests which lurk beneath the surface. To ensure the quicker germination of the seeds of alpine plants it is usual to expose the pots of soil in which they are sown to frost and snow by placing them out of doors. During severe frosty weather plants in cold frames should be well protected by mats. *See* Apricot; Frame; Fruit.

FROST BITE. This most commonly affects the fingers, the toes, the ears, and the tip of the nose. Children, old people, and alcohol drinkers are the most likely victims.

In the mildest form the skin turns to a dusky red, a soft swelling occurs, and pain may be acute. This is the common chilblain. In a further stage the chilblain becomes a blister, which may break and leave a small ulcer. In still severe degrees gangrene results.

When any part is actually frozen, the circulation must be restored very slowly. The patient must on no

account be taken near a fire nor even into a warm room. Put him in a cool room, and gently rub the frozen part with snow, or with a piece of flannel wet with cold water. As the blood begins to circulate, tingling and pain may be felt. When this occurs the rubbing may be carried out more briskly, the hands of the nurse may be applied to restore warmth, and the patient may be taken into a warmer room.

The sufferer may now be given a small quantity of warm liquid, such as hot milk or tea. If the fingers or the toes become much congested, raise the limb. As soon as the circulation is fairly restored, wrap the part in cotton wool or flannel. *See* Chilblain.

FROSTED GLASS. Frosted or ground glass is produced by two essentially different methods. By the first an acid is used to etch away the surface of the glass, and thus render it partially or wholly obscure. The second process consists of grinding the surface with emery and water, thus producing the familiar appearance of frosted or ground glass. A similar result is also obtained by sand-blasting. *See* Glass.

FROZEN FOOD. Many kinds of food are frozen for purposes of keeping. If frozen meat is properly cooked and of good quality, it almost equals the home-killed variety.

Meat should never be cooked while the frost remains in it; it must be melted out in cold water before the meat is exposed to the fire. Frozen meat requires longer and slower cooking than home-killed meat.

Freezing has a more deteriorating effect on beef than on mutton and lamb, Canterbury lamb in particular suffering little by the process. All frozen meat shrinks while cooking, and allowance for this should be made when it is bought.

All kinds of game are now preserved by chilling and freezing, which enables this favourite food to be served at table long after the game season is over. Rabbits which have been frozen should be converted into entrées or stews. They should be cooked longer than fresh rabbits, and be made savoury with plenty of vegetables. It is not advisable to roast frozen rabbits. Most poultry makes an excellent food when frozen. The birds, if of really first rate quality when preserved, may be cooked by almost any method employed for fresh poultry.

Fish which is frozen can be kept for weeks and will be quite fit for table, but it should be soaked for some hours in cold water before being cooked.

Milk is sometimes frozen in blocks, especially if intended for use during a long voyage. When thawed it more closely resembles fresh milk, and is invaluable where invalids or young children are concerned. Fruit also can be kept for a considerable time in cold storage. *See* Beef; Ice; Mutton; Refrigerator, etc.

FRUIT: ITS FOOD VALUE AND ITS CULTURE

With Details about the Planting of an Orchard

Further information will be found under the headings Apple; Pear; Plum; Strawberry, etc. See further Grafting; Pruning; also Diet; Food; Jam.

When obtainable in good condition, fruit should be eaten as regularly as any other article of food. The great majority of fruits contain scarcely any tissue-building or energy-producing substances, but they are rich in salts and vegetable acids. The latter undergo changes in the course of digestion and appear ultimately as alkaline carbonates.

Fruit as Food. While not contributing material for growth and repair, some fruits are rich, however, in the vitamin which is necessary to a healthy development and existence, and the absence of which from the diet leads to the occurrence of scurvy. Lemons, oranges, and grapes are fruits that may be mentioned in this connexion.

With some exceptions fruits contain from 80 to 90 per cent of water. Fruits containing over 80 per cent of water are practically useless from the nutritive standpoint alone, but they are nevertheless invaluable for the salts that they contain. Their solid contents consist of sugar, salts, chiefly of potash, and cellulose. The nutritive qualities of a fruit depend chiefly on its content of sugar. Dates and figs, prunes and raisins, contain about three-fourths of their weight of sugar, and also from 2 to 4 per cent of protein. Bananas contain more than 20 per cent of sugar, grapes and plums about 15, apples and apricots about 10-12 per cent. The slight percentage of food material in fresh fruit is reduced by cooking.

For children fruit is particularly wholesome, and, as is shown by their craving, it is a really necessary article of diet. The best varieties for children are apples, oranges, grapes, and bananas. Fruit alone cannot nourish a child, but fresh fruit should be a part of a mixed dietary of milk, cereals, eggs, and meat suitable for young children.

Ripe fruits act as a regulator of the system, and provide some of the extra fluid required in hot weather. Livery people may eat stewed fruit with advantage. Grapes are valuable in cases of ailments arising from a too generous diet, and the juice is a wholesome laxative. All fruit is more or less laxative, and good for constipated people, when eaten fasting.

Oranges have been recommended in certain cases to persons of a diabetic tendency; but patients should consult an expert physician before experimenting with sweet fruits.

Watery fruits, such as melons, limes, oranges, and apples, are wholesome thirst quenchers, partly through the water they contain and partly by stimulating the flow of saliva.

Fruit should be eaten only when fully ripe, but not when beginning to decompose. In cities fruit is frequently sold in a very underripe condition. It is then indigestible, and lacks the sugar which forms its chief nutritive matter. In strawberries is found the same acid that is contained in apples. Lemons and oranges contain citric acid. These acids undergo a change in the bodily chemistry, and do not increase the acidity of the

blood.

	Water %	Carbohydrate (sugar)%	Protein %	Acids %
Apples	83	12	½	1
Apricots	85	12½	1	1
Bananas	74	23	1½	—
Blackberries	89	2½	1	—
Cherries	84	10	1	1
Currants	85	8	½	1½
Dates	15½	75	2	
Figs	19	68	4⅓	—
Gooseberries	86	9	½	2½
Grapes	79	16	1	½
Oranges	87	8½	1	1
Peaches	89	6	½	¾
Pears	84	11	½	1/10
Plums	78	15	1	1
Prunes	22	71	2	2¾
Raisins	15	74	2½	--
Raspberries	84	5	1	1½
Rhubarb	94	2½	½	--
Strawberries	89	6	1	1

Fruit. Table showing the average food content of the principal varieties of fruit.

The best time to eat fruit is about two or three hours after a meal. Immediately after food it very often interferes with digestion.

A person suffering from gastritis or diarrhoea would aggravate his malady by eating fruit. In some people, too, many fruits produce flatulence. Fruit containing many seeds, including strawberries, raspberries, blackberries, figs, and currants, often cause great irritation of the intestine in children and elderly people.

Plums, peaches, and apricots are rather tough, and unsuitable for people of weak digestion. The most digestible kinds are oranges, grapes, grape-fruit, raspberries, and fully ripe apples and pears.

The Growing of Fruit. The growing of fruit is a matter of considerable interest, and there are many who wish to have, not merely a few apple, plum, pear, or cherry trees, but a garden or orchard in which a variety of fruit can be grown on scientific and economical lines. Such a garden should include what are known as top trees, i.e. apples, cherries, plums, etc., between which trees bearing soft fruit, as it is called, i.e. currants, gooseberries, raspberries, as well as strawberries, should be planted.

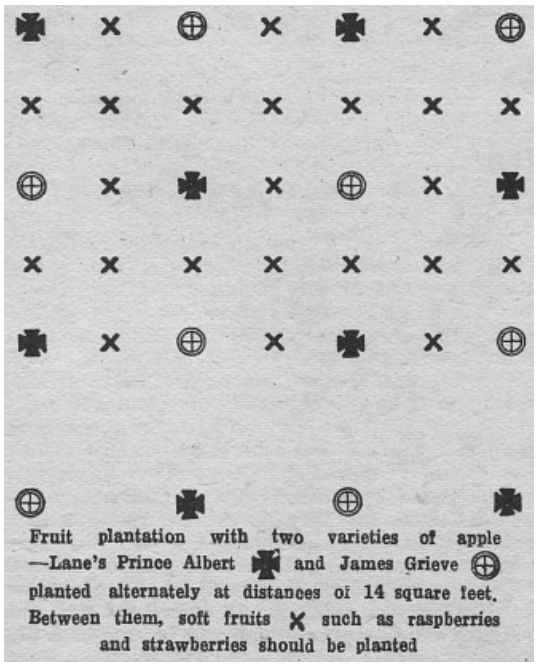
The varieties chosen must be suited for the particular soil; the manner in which the trees are to be trained must be settled beforehand and the plantation must be arranged so that the trees have sufficient space to grow without overcrowding. Top trees take about 20 years to reach their prime; soft fruit trees take a much shorter time.

The land selected for a fruit plantation, if at all exposed to high winds, must be protected by a windbreak. Lombardy poplars are generally used for this purpose. Cuttings about 1 ft. or 1 ft. 6 in. long and 3 ft. apart should be planted along the boundaries of the plantation the same year as the top fruit is planted, and they will have grown into a high hedge by the time the fruit trees begin to bear. If a shelter or hedge of poplar is not considered sufficient, the first row of fruit trees should consist of damsons or plums of the Monarch or Kentish bush variety, which will serve as a second shelter.

Fruit plantations must be properly fenced to prevent damage from hares and rabbits when the trees are young, and pilfering when they begin to bear. The choice ol varieties is always difficult. Success is fairly certain if only standard varieties are planted, but it is desirable to make careful inquiries as to which are the most successful in neighbouring plantations, so that the selection can be based upon local knowledge of the soil and its capacities.

Care must be taken that each tree is allowed sufficient space for growth. It is a great mistake to plant trees so closely that when half-grown they have to be pruned very severely, as this leads to a great decrease in the annual yield of fruit.

Four Systems of Planting. There are in all four systems of planting top fruit trees: square, quincunx, triangular, and cordon. For the square system the land is marked out in a series of squares and the permanent trees are planted in the corners of each square, with fillers and soft fruits in between.

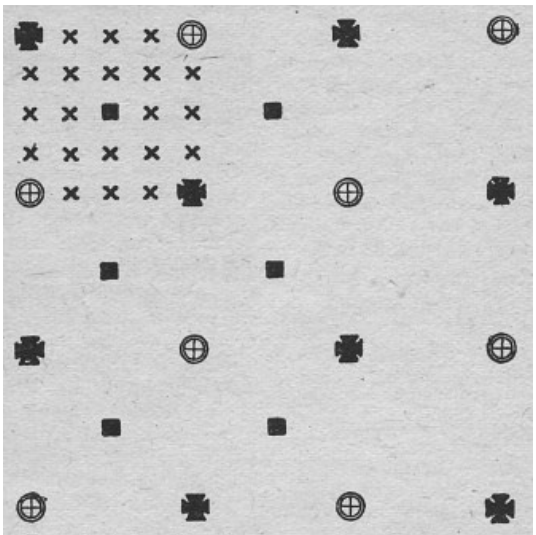


Fruit plantation with two varieties of apple —Lane's Prince Albert ✠ and James Grieve ⊕ planted alternately at distances of 14 square feet. Between them, soft fruits ✕ such as raspberries and strawberries should be planted

In plantations of this kind thinning is effected in the following manner: The small fruits are grubbed as soon as the permanent trees or fillers require more space, and later on the alternate fillers themselves are removed, thus leaving a tree in the centre of each

square formed by the permanent trees. Finally, when the permanent trees are nearly full grown, the remaining fillers must also be grubbed.

The quincunx method of planting is very like the square system. The plantation is arranged in a similar way, except that a tree is planted in the centre of each square. As a rule, the trees planted in the centre of the square are fillers, but if they are to be retained permanently, an upright variety must be selected so that all chance of overcrowding is avoided. Inter-planting with fillers and soft fruit can be carried out quite as easily as with the square system.



Fruit planted on the quincunx system. Apples of the Newton Wonder ✠ and Allington Pippin ⊕ varieties are planted at distances of 24 square feet. In the centre of each square is a nut or bush plum ■ and between the apples, at a distance of 6 square feet, is soft fruit ✕

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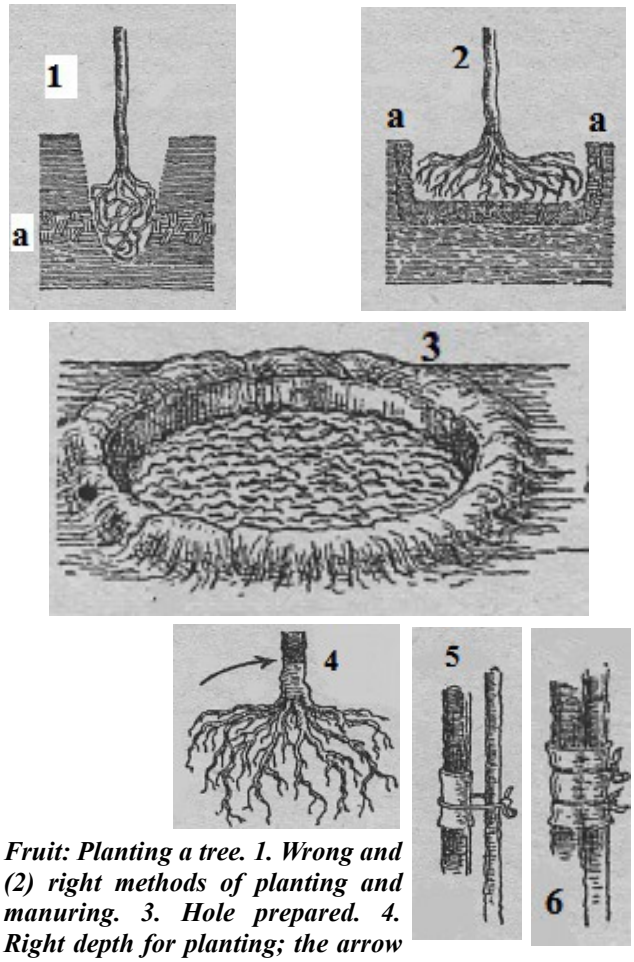
In the case of triangular or hexagonal plantations the trees are planted at the corners of a series of equilateral triangles, and are, therefore, equidistant. Such plantations cannot be thinned satisfactorily, and the system is only suitable for plantations consisting entirely of permanent trees. In the cordon system the trees are planted in rows 6 ft. apart and 2 ft. 6 in. apart in the rows. The direction of the rows should be north and south, and the trees trained at an angle of 45 degrees to the ground inclining to the south.

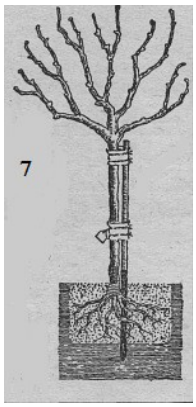
The following are suggestions for plantations of fruit: Bush apples, for example Lane's Prince Albert and James Grieve, may be planted on the square system, 14 ft. apart. They should be inter-planted with red or black currants or gooseberries at 7 ft. Alternatively Newton Wonder and Lord Derby can be planted at 20 ft. square apart, also on the square, and between them, soft fruits at 5 ft. square. A third scheme for bush apples is Worcester Pearmain and Allington Pippin at 18 ft., inter planted with soft fruits at 6ft. If half-standard trees are preferred Newton Wonder and Allington Pippin should be planted on a 24 ft. square system. In this case bush apples, pears, plums, or cob nuts can be planted in the centre of each square, and the intermediate land can then be interplanted with soft fruits at 6 ft. square.

Turning to plums and pears, bush plums of the Victoria and Czar variety planted at 14 ft. square make a good plantation. Soft fruits can be planted between them at 7 ft. square. Bush pears of the Conference and Durondeau varieties can be planted at 12 ft. square with soft fruit at 6 ft. between them. A more elaborate scheme is for a mixed plantation of standard trees. Apples of the Bramley Seedling and Lord Derby variety should be planted at 40 ft. on the quincunx plan. Between them bush Czar plums should be interplanted at 20 ft. The intermediate land can be planted with Stirling Castle or Lane's Prince Albert apples as fillers at 10 ft. square or with soft fruits at 5 ft.

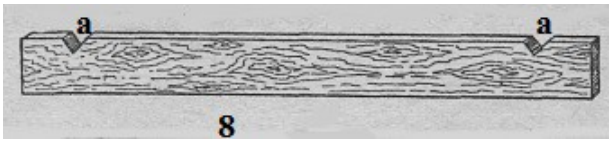
Fruit trees may be planted at any time during their dormant period, provided the land is in a dry, friable condition so that the soil can be worked well in amongst the roots and the land can be firmly trodden without puddling it. The best time to plant is in November and early December. If the land is in good form, no application of manure need be made unless interplanting with strawberries, raspberries, or a vegetable crop is contemplated, in which case a normal dressing of 20 tons of dung per acre should be given. The exact position of each tree should be clearly marked with a stick or stake.



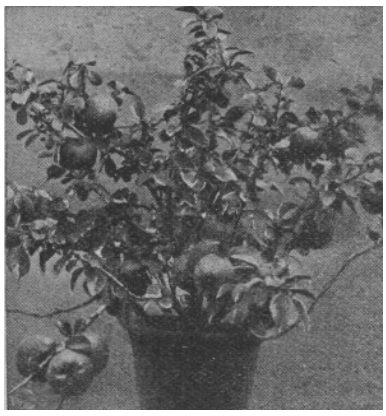
Fruit: Planting a tree. 1. Wrong and (2) right methods of planting and manuring. 3. Hole prepared. 4. Right depth for planting; the arrow shows where the old soil ends. 5. Right method of tying a stake after planting. 6. Tying at a later stage.



7. Good example of planting and staking. 8. Notched board, useful for planting trees at equal distances.



Bush Fruit Trees. Fruit trees may also be grown in pots, and although such cultivation is thoroughly practicable, it is not a profitable proposition without glass. Good specimens should be obtained during the autumn from a nurseryman specialising in established pot-trees. Repotting is a most important factor, being necessary every few years to keep the trees healthy and fruitful. Roots should always be freed of old exhausted soil previous to potting, and clean pots with ample drainage prepared to receive the plants. A layer of broken turf is then placed on top of the crocks and the roots placed in position. Soil must be well distributed, and made very firm with a potting stick. Pots of about twelve inches in diameter are a suitable size. Leave an inch or so between soil and pot-rim for watering. After potting give a thorough soaking.





Fruit. Above, seedling Japanese quince and, right, single-stemmed red currant tree, grown in pots (Our Homes & Gardens)

Early in the year the trees are placed under glass; a temperature of 40 to 45 degrees is high enough for the first few weeks; this may be increased to 50 to 55 degrees later on. When the trees are in blossom the greenhouse must be ventilated freely.

Pot fruit trees are placed out of doors when the crops have been gathered; they must be in a sunny position, the pots plunged to the rims in ashes. Careful watering is necessary to ensure that the soil does not become dry. Pruning is done chiefly by disbudding to prevent the growth of superfluous shoots. Apples, plums, cherries, and figs are suitable for this form of culture.

Removing Fruit Stains. Before it has time to dry the affected part should be covered with salt and then washed without soap, the alkali in the latter tending to fix a stain rather than to remove it. If the stain is dry, the material should be stretched over a basin and water which is almost boiling poured over the mark. Very delicate fabrics may be treated by spreading them over a piece of blotting-paper and then sponging on the wrong side with hot water. If the mark still remains, moisten it with a little lemon juice and then rinse it with hot water.

Fruit stains on the hands can be removed with olive oil and castor sugar. Mix a little of the sugar and oil to a paste, and then rub this well into the skin. Let it remain for a few minutes before washing the hands in warm soapy water. Obstinate stains may need two or three applications. *See* Stain.

FRUITADE. Black or red currants, whortleberries, and raspberries are probably the most suitable fruits for making this drink. Put them into a preserving pan, allowing a quart of water to every pound of fruit. Heat it up, then strain it carefully through a jelly bag and add the juice of 1 lemon and ¼ lb. of sugar to every quart of syrup. Stir the whole until the sugar has dissolved, and, when cold, add a little ice and serve.

Various kinds of syrups useful for flavouring purposes are made in much the same way, except that less water is used. The juice of the fruit is either squeezed out, as in the case of oranges, and then boiled with a little sugar, or extracted by stewing with sugar and a little water, and then boiled up with more sugar. *See* Loganberry; Mulberry; Orange; etc.

FRUIT SALAD. This attractive dish is a favourite sweet for parties and also for the dinner table in summer. Fruit salad is made from uncooked fruits, either fresh, canned, or bottled. The more varieties of fruit contained in the salad the better it is. Pineapple chunks form a good foundation. The salad can be served plain or with cream, ice cream, or custard, with chopped nuts or desiccated coconut as a garnish. Tinned fruit salad can be obtained ready mixed for use.

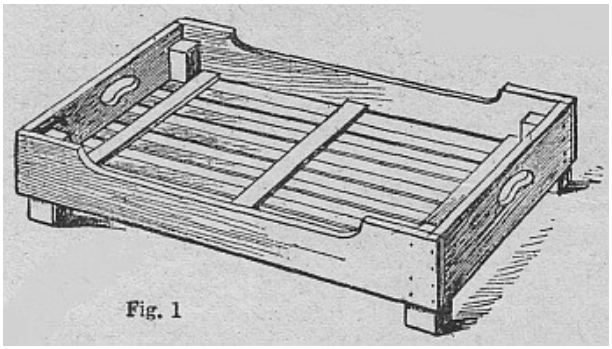
To make the salad of oranges, bananas, and apples, or other comparatively dry fruits, a syrup must be made from sugar and water boiled together and coloured pink with cochineal. The fruit should be sliced, sprinkled with castor sugar, covered over and put aside for an hour or so, and the syrup poured over when cold. A wineglassful of sherry added to the syrup is an improvement. Fruit salad can be served in separate small glasses or in a bowl.

FRUIT SAUCE. This sauce can be made from either fresh or bottled fruits. To prepare it, boil together 2 gills of water, 2 breakfastcupfuls of red or black currants, raspberries, or any similar fruit, and sugar to taste. Skim the sauce frequently, and when it thickens strain and serve it with any sweet pudding.

FRUIT SLICE. This labour-saving device consists of a special knife which peels and also slices fruit quickly and neatly. Such a knife may also be used for peeling and slicing or chopping vegetables.

FRUIT TART. Various kinds of fresh or bottled fruit, used either separately or in conjunction with others, are employed in the making of fruit tarts. Blackberries and apples, raspberries and red currants, and apples and rhubarb are suitable combinations, though any one may be used alone. *See* Pastry.

FRUIT TRAY: How to Make. A useful article, frequently in demand, is a fruit storage tray. Convenient sizes are 24 in. by 16 in., 27 in. by 18 in., and for a fairly large size 30 in. by 20 in. American whitewood is very suitable for making one, but birch, beech, white pine, ash, satin walnut, and common deal can be pressed into service, allowing a shade extra for thickness for the last-named kind of wood.



Fruit Tray. Fig. 1. Tray with recessed blocks, allowing similar trays to be stacked above.

Fig. 1 shows a useful type of tray. The sides can be 4 in. wide, and are cut to shape to allow a free flow of air to the fruit, at the same time giving hand clearance. Kidney-shaped hand holes are also indicated in the ends. The sides can be nailed together, and are stiffened in the angles by blocks. These can finish 1¼ in. by 1¼ in. by 4¾ in. long, and when in position will recess ¾ in. below the top edge of the frame and project 1½ in. below it to form toes. The recessing of the blocks will permit of similar trays standing firm1y above one another when being stacked. Close up to the blocks, and in the centre, three cross rails, about 1¾ in. by ¼ in., and with the upper edges rounded away, are let in flush with the bottom edge of the frame and screwed. The lath bottom of 1¼ in. by ⅛ in. lengths is screwed or nailed to these and to the framing (Fig. 2). The stretcher can be cut in right through, as at A, but is best masked by setting the ends ⅛ in. in front face of the framing.

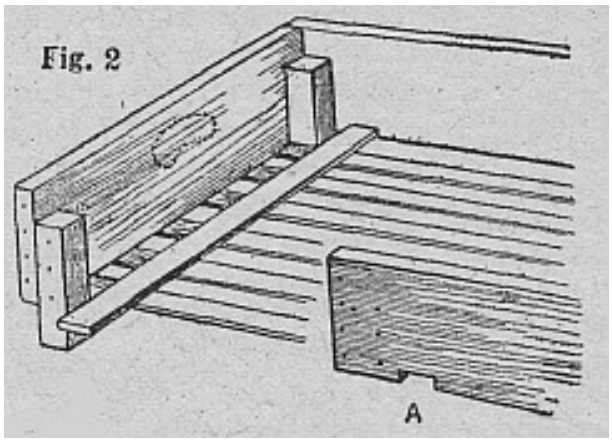


Fig. 2. Parts of the fruit tray: A side cut away for stretcher.

Racks for Trays. In stacking, the difficulty is always that to get at the lower trays, all the upper ones have to be lifted off. Some form of rack, therefore, has its uses, and that sketched at Fig. 3 is easily put together. Four 5 ft. lengths of 2 in. by 2 in. material will serve for the uprights, with the rails top and bottom of the same material cut to the necessary widths and depths. These are mortised and tenoned together, and an additional rail, 3 in. by 1 in., dovetailed in or screwed at back, can be added for fixing to the wall. The main feature of this design is that each tray will draw out, bearing being obtained by glueing and screwing a 1¼ in. by ½ in, fillet to the sides of the drawers, so that these can travel on similar fillets of the same width and thickness, screwed horizontally, and at equal heights to the inside of the front and back up-rights to serve as slides. The corner blocks of trays must not in this case project below the bottom. If properly spaced a bray can be inserted between each pair of sliding trays, so that it travels on the edges of the tray immediately below it. Fig. 3 should make these points clear.

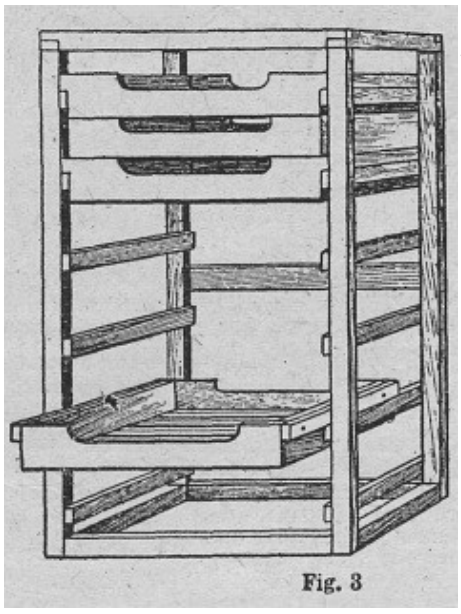
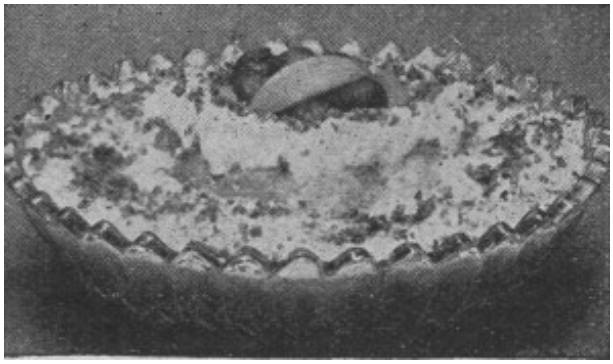


Fig. 3. Back for holding trays, which can be drawn out separately.

FRUIT TRIFLE. This makes an excellent party sweet. Prepare it by splitting a sponge ring into halves, spreading it with apricot jam, and placing the bottom half in a dish. Drain the syrup from a small tin of fruit salad, heat it, and then pour some of it over the sponge in the dish. Put on the top half of the cake, soak it with the remainder of the syrup, and, if liked, also pour over it ½ gill of sherry. Beat together one whole egg and the yolks of two others, and add to them 1 pint of milk and 1 dessertspoonful of sugar. Pour the custard into a jug, and stand the latter in a saucepan of water over the fire, stirring its contents until they thicken.



Fruit Trifle. Popular dish for a children's party.

Add a little vanilla flavouring, and when the custard begins to thicken take it out and leave it to cool. Then pour it round the outside of the sponge ring until it is not quite level with the top of the cake, and leave it to get cold. Heap the fruit salad in the centre of the ring; add a pinch of salt to the whites of the two eggs, and whisk them to a stiff froth. Fold into them a dessertspoonful of castor sugar and shake them all round the top of the sponge cake, leaving some of the fruit in the centre uncovered. If sufficient, shake the remainder over the custard and sprinkle the whole with chopped pistachio nuts.

FRY. Such parts of lamb and pork as the liver, heart, etc., are known as fry, and, in the case of pork, also as haslet or harslet. The sweetbread is also included, and in lamb this is considered a great delicacy. The most usual way of preparing such a fry is as follows: Wash and dry it well, removing any un-eatable parts. Lay it in a saucepan with cold water to cover it, and a little salt, and dry it and cut it into thin slices, dipping each piece into flour seasoned with salt and pepper. Heat about 2 oz of good dripping in a frying pan, lay in the fry and cook it a rich brown. Take out the pieces and keep them hot while the gravy is made. Into the fat in the pan sprinkle a level tablespoonful of flour, fry this a nut-brown colour, taking eare that it does not burn. Pour in 1½ gills of stock and stir the whole over the fire until it boils. Season carefully, arrange the fry in a hot dish, and strain round the gravy. If liked, a small chopped onion can be fried with the meat. If liver alone is served, garnish with bacon. *See* Bacon; Liver; Sweetbread.

FRYING. Frying consists of cooking food in smoking hot fat or oil. As it is the quickest method of cooking, it is especially useful in an emergency when dishes have to be prepared at a few minutes' notice. Cheap pieces of meat with tough fibres should never be fried, the rapid cooking only serving to make them more tough, hard and indigestible. Fat must reach a far higher degree of heat than does boiling water before food can be successfully fried in it, and should give off a faint blue smoke before the actual frying commences.

There are two methods of frying, the shallow or English method, and the deep or French method. In shallow frying only a small quantity of fat is used, and when one side of the food is cooked it is turned over so that the other side will cook. Deep or French frying requires a deep pan containing enough fat to cover well the food to be fried. French frying is used for rissoles, filleted fish, fish-cakes, etc., and the article to be so cooked is coated with batter, egg, and breadcrumbs or pastry. With both methods the fat must be heated until a blue smoke arises before the food is put in.

Of the two methods, deep frying is the more economical, for though it requires a large amount of fat, the latter, after use, can be strained into a basin and used again, whereas what little remains after shallow frying is usually full of crumbs, etc., and is thrown away. All fried foods should be well drained on kitchen paper before serving and kept very hot, other-wise they will become flabby and indigestible.

Frying Basket. When small articles or delicately flavoured and fragile preparations are to be fried, a frying basket is an asset. Made of bars of wire, this basket fits into a metal pan and is used in deep frying. The basket fits down into the hot fat, and, in the case of small articles, when ready all can be lifted out of the fat at once and none are overcooked. Small fish should always be fried in a basket. Fritters, or any preparation that has been dipped in batter, should not be fried in a basket, as the coating sticks to the bars and does not brown and become crisp.

Frying Pan. These can be obtained in tin, enamel, iron, steel, and aluminium. The three latter are the best materials, as boiling fat melts the solder of tin and injures the surface of enamel. An iron or steel frying pan is used with a kitchener, and aluminium is the best material to use with a gas cooker.

To clean an iron frying pan, scrape off as much grease as possible, scour it well inside and out, rinse it in hot water, and dry it thoroughly with a dishcloth. If some grease still remains, the pan may be filled with water containing a little soda and the water brought to the boil. Aluminium pans may be cleaned in the same way, except that the soda must be omitted, while frying pans made of enamel should be treated according to the general directions for cleaning enamel.

Electric frying pans, made of heavy spun steel and supported by stands, are useful breakfast-table

appointments. They can be obtained in various sizes, and their chief advantages are that food can be prepared in them more quickly than on a gas-stove or before a fire, and can also be served immediately it is cooked. *See* Batter; Breadcrumbs; Fish; Sole; etc.

FUCHSIA. As a native of S. America, the fuchsia is not generally hardy in British gardens except in the S.W counties. Its graceful habit of growth, its distinct and beautiful pendent blooms, the ease with which it may be cultivated and its adaptability to all conditions, ensure it a place in every greenhouse collection.



Fuchsia. Two varieties of a graceful and easily cultivated greenhouse and summer bedding plant. Left, single; right, double.

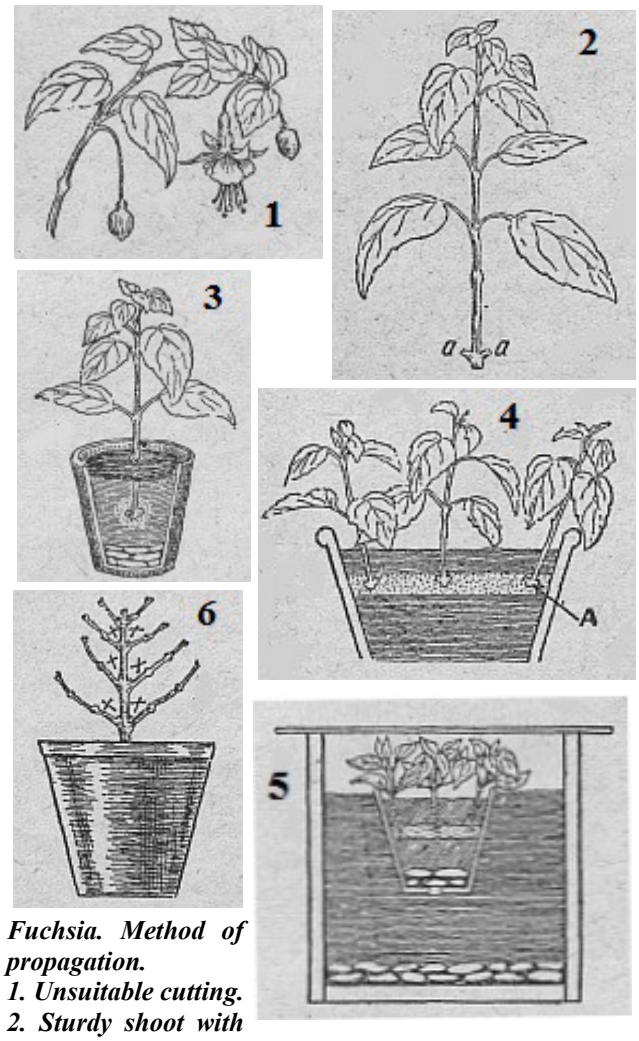
It may be grown as a pot plant for summer-bedding, or it will develop into a large shrub if tended year after year without being over-pruned. Those who have only used it for greenhouse decoration should experiment with some of the largest specimens and pot them on until they are big enough to occupy a good-sized tub.

Ordinary loamy soil, with a little leaf-mould, decayed manure, and some sand will suit the plants. During the flowering season they should be well watered. In the winter they should be dried off. Cool-house treatment will suit them all through. Before they start into growth in the spring they should be repotted and cut back.

Propagation is simply effected by putting young shoots in sandy soil under glass in August. These cuttings root very freely, especially in a propagator.

In spring the shape of the plant must be decided on. If a standard fuchsia is wanted the plant is allowed to reach the desired height of stem before it is stopped. If a pyramid is wanted the top of the plant should be cut off to ensure the development of side shoots. Magnificent, tall, pyramid-shaped fuchsias can be obtained by carefully stopping and training and by repotting as becomes necessary.

Hedges and large bushes of hardy fuchsias are familiar to all visitors to the south-west and other mild districts of the British Isles. These shrubs will also flourish in colder districts, though there they are often cut to the ground by frost in winter. If a covering of old ashes is placed over the roots in autumn the shrubs will usually start into fresh growth in spring. The best of the hardy fuchsias are macrostemma, Riccartoni, and gracilis. *See* Bedding; Greenhouse. Pron. Few-shah.



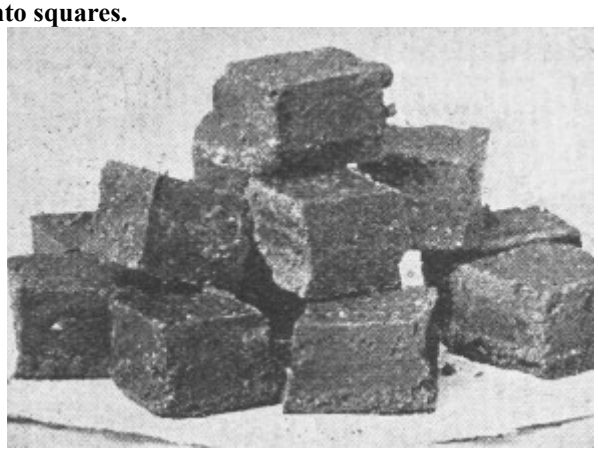
Fuchsia. Method of propagation. 1. Unsuitable cutting. 2. Sturdy shoot with heel (a). 3. Potted shoot with sand round heel. 4. Several cuttings in single pot; A, sand. 5. Cuttings in glass-covered box. 6. Old plant pruned to furnish side shoots.

FUDGE. A sweetmeat that hails from America, fudge is made from white or brown sugar, milk, cream or condensed milk, butter, and flavoured with chocolate, coffee, and vanilla essence.

The ingredients required for chocolate fudge are ½ lb. brown sugar, 2 tablespoonfuls of butter, 4 tablespoonfuls of chocolate powder, a small tin of unsweetened evaporated milk or a teacupful of milk, or ½ teacupful each of cream and water, and a little vanilla essence. Mix the chocolate powder with the milk, cream, or evaporated milk to a smooth paste. Melt the butter in an enamel or aluminium saucepan. Add the sugar and chocolate by degrees and boil up gently until a little of the mixture dropped into a cup of cold water hardens when rubbed between the fingers. Remove from the stove and add the vanilla flavouring. Pour the mixture on to a shallow buttered tin and mark it out into squares with a knife before it sets.

Another and cheaper way of making chocolate fudge is by using 4 tablespoonfuls of cocoa powder instead of chocolate.

Coffee Fudge. To make this use a teacupful of golden syrup, a breakfastcupful of brown sugar, a small tin of unsweetened, condensed milk, a tablespoonful of butter, and 2 tablespoonfuls of coffee essence. Melt the butter in a saucepan over the fire and add the syrup and the sugar. When these are well blended, add the coffee essence previously mixed with the milk. Boil it all together gently for 15 min., stirring all the time. Remove from the fire and beat the mixture until the sugar begins to crystallize round the sides of the pan. Pour it on to a buttered tin and mark it out with a knife into squares.



Fudge. American sweetmeat resembling soft toffee, made in various flavourings.

FUEL: The Varieties Compared. The chief fuel burned in the homes of Great Britain is coal of the ordinary or bituminous kind. Other fuels are anthracite and coke, used for special slow combustion stoves and for boilers. In country districts a good deal of wood is used, while in some parts of the country peat is burned. Oil, too, is employed as fuel, while electricity and coal-gas, though not strictly fuels, can be used for warming rooms, heating water, melting metal, and similar purposes. Peat is only found in certain parts of Great Britain, Cheshire, for instance, and owing to its smouldering propensities is only suitable for fires that are not intended to brighten as well as warm a room. There are also patent fuels on the market, but the value of these varies.

Gas fires and cookers and electric heaters and cookers are installed in many homes. In others a system of central heating is arranged, but in all these a certain place is usually left for coal fires, which, although somewhat wasteful, have attractions for so many persons.

Special coke grates are procurable which combine the cheerful glow of the open fire with some of the advantages of the gas fire. The coke is ignited by gas jets at the bottom of the grate, which are turned out after about 20 min., the coke then being well alight. In an ordinary grate, with coal as the main fuel, logs of wood can be burned, and if oak or any other good hardwood is bought it is not unduly expensive. *See-* Anthracite; Coal; Coke; Electricity; Gas; Oil; Peat; Wood.

FULHAM WARE. The stoneware produced by John Dwight at Fulham in the last quarter of the 17th century is highly prized because it marks the beginning of great art in English pottery. Examples of the fine statuettes which he moulded are not often met with.

There was a large output of Fulham ware of more useful types, readily distinguished from the Cologne ware on which it was founded, and this may be collected to advantage. Besides greybeards it includes brown mugs and tankards, sometimes with hunting scenes and Hogarth designs in applied reliefs. There are also flasks and jugs with horizontal ribbing round the neck, simple noggins with little or no decoration, and the like.

This domestic pottery successfully displaced the Flemish Grès ware of the time, and was the forerunner of Staffordshire salt-glaze. Modern Fulham ware is represented by normal types of brown stoneware and other domestic designs. *See* Pottery.



Fulham Ware (British Museum).

FULLER'S EARTH. This mineral is used as a dusting and cleansing powder, both for clothing and for the skin. In the former case it is efficacious in removing grease from woollen and other fabrics, and enters into the composition of some makes of cloth ball. Fuller's earth is used on the skin, especially when a bland, inert covering is required for an irritated or chafed surface, and is therefore an ingredient in certain soaps and face creams. It is sometimes used for powdering the skins of babies, but when applied as a dressing for the navel or inflamed buttocks of infants it appears to have been followed by tetanus or lockjaw. A powder containing boracic acid is always therefore to be preferred for this purpose. Fuller's earth can also be employed for cleaning floors and other wooden surfaces. *See* Boracic Acid; Cloth Ball; Clothes; Face; Stain, etc.

FUMED OAK. Oak can be darkened by subjecting it to the fumes of ammonia. This gives an appearance of age and enriches the colour, though the natural colour of new oak is often preferred when wax polished. Mahogany and some other woods are affected by ammonia fumes, which are an alternative to the use of liquid stain. The sapwood of oak is not affected by ammonia, and where this occurs stain must be used to make the parts match. Some kinds of American oak cannot be fumed. The method is to enclose the work for 12 to 24 hours in a case, cupboard, or small room, with one or more open saucers of liquid ammonia. A packing-case should have strips of paper pasted over joints that are at all open. If one or more panes of glass can be fitted as windows the work can be examined

without opening the case and letting fresh air in. A quick test of the effect ammonia will have on the wood can be made by placing a piece on the open mouth of the ammonia bottle. A trial for a few minutes will show whether the wood can be fumed or not.

Fuming is usually done after the construction of the article is finished, but before the application of varnish or polish.

FUMIGATION. The idea that houses require fumigation after illness from some infectious disease is being rapidly dispelled. It is now generally recognized that in the majority of cases infection is spread by contact with a patient suffering with, or recovering from, the infectious disease. Fumigation of rooms after such cases has been discontinued in many large towns and boroughs without any increase of infectious cases, though spraying with disinfectant is carried out instead.

Fumigation of rooms for the purpose of getting rid of household pests is still common, but here again the advent of the modern form of penetrating spray, together with the discovery of suitable insecticides, has largely superseded the use of a gaseous disinfectant as a means of exterminating insects. The fumigation of books, gloves, boots, fancy leather work and dresses and all fabrics which are likely to be ruined by steam disinfection is still carried on. Rooms or other spaces to be fumigated must first be sealed hermetically, and can then be treated adequately by fumigation if desired.

Sulphur or formalin are most often used. Sulphur may be used in the form of crushed rolled sulphur or as sulphur candles. These are obtainable in varying sizes from chemists, and are provided with instructions as to the number required for a given space. Liquid sulphur gas in cylinders may also be used. The room should be kept sealed for at least 24 hours.

Formalin is usually employed in a special apparatus which heats the liquid, causing the gas contained in it to be given off. From 10 to 15 oz. of formalin are required for every 1,000 cubic ft. of space. Another method is to pour 10-15 oz. of formalin on to 5 oz. of potassium permanganate crystals contained in a deep dish. Enough gas is produced to treat 1,000 cubic ft. of space. Formalin may also be used in the solid form of paraform tablets. These heated in a special lamp give off formalin gas, 30 tablets being used for 1,000 cubic ft. of space.

In all methods of formalin fumigation the room should be kept warm and moist, and remain sealed for at least six hours. After fumigation the room should be well aired and thoroughly cleaned.

Other Uses of Fumigation. Fumigation is also practised for protecting plants, fruit trees, and the like from the ravages of garden pests. Among those used in this connexion are carbon bisulphide, formalin, and hydrocyanic acid gas. Carbon bisulphide is recommended for use against the apple sawfly, as injections of it will destroy the pupae of the sawfly in the soil. As it is poisonous care should be taken not to inhale it freely.

Fumigation may be used also to destroy rats, but this is inadvisable where they are in dwelling-houses, and it must be employed with great care wherever food is stored. For burrows in the open carbon bisulphide may be used. A large wad of cotton wool, rags, or similar material should be soaked with the liquid; this should be at once inserted in one of the main burrows, and its outlets and inlets closed up. The liquid evaporates, permeates through the burrows, and asphyxiates the rats. This fumigant is not only poisonous but inflammable. No light, therefore, should be brought near it. Fumigation is also one of the methods employed for destroying wasps, and in a different way for protecting furniture. *See* Disinfection; Furniture; Rat; Spray; Wasp.

Fumitory. *See* Corydalis.

FUNERAL: The Arrangements. When a death takes place, the nearest relative, or someone acting for him or her, must make arrangements for the funeral, which should take place not later than the fourth day from the death of the person.

The first duty is to see that the body is properly laid out, this task being usually performed by a woman. If no one is known, an undertaker will supply one.

The next urgent matters are to notify the death to the registrar, to choose the grave, and to fix a time for the funeral. If a doctor has been in attendance he will give a certificate of death, which should be taken to the registrar for the district, at whose offices the necessary particulars about the deceased, age, etc., are entered. If no doctor has been in attendance, the coroner must be told, and he will arrange for an inquest, if necessary.

An undertaker should be sent for, or visited, and terms arranged with him. Usually, on knowing how many persons he must convey, the place of the burial, and other such matters, he will fix an inclusive fee for carrying out the funeral, including not only the hire of cars and bearers and the purchase of the coffin, but the payments at the cemetery and the fees to the clergyman or minister and others. He must be given the death certificate which has been supplied by the registrar, and which he must show to the officiating clergyman.

The grave should then be chosen by visiting the cemetery or churchyard where the deceased is to be buried. The undertaker will also make this arrangement if requested. In some cases the ground for the grave must be bought outright; in others only an interment fee is charged. Where there is a family vault, notice must be given that it is to be opened. In parish churchyards there is usually some difference made as to fee between parishioners and non-parishioners. The time for the funeral must be fixed, in conjunction with the undertaker, and the invitations sent out.

The service will be conducted by the clergyman or minister attached to the graveyard unless the mourners wish for their own clergyman, in which case they should acquaint the one in charge with their wishes. It is usual also to put a notice of the death in The Times,

The Daily Telegraph or the local paper. This may give the time and place of the funeral, and if no flowers are required it should state that fact. Relatives only may be invited, but in other cases invitations are extended to friends. In the case of persons having a large circle of friends it is not uncommon to hold a service, to which all friends are invited, quite apart from the funeral ceremony proper.

The Funeral Ceremony. On the day of the funeral the guests arrive at the house just before the time appointed for the procession to leave it. After the coffin has been carried out they will be escorted to the cars, the nearest relatives taking precedence over the more distant ones and over friends. In most cases friends go to the church, but only near relatives to the house.

On reaching the cemetery a service will be held in the church or chapel, and then the mourners will follow the body to the grave, where the burial sentences are recited. The guests may return to the house, where perhaps light refreshments are served. On returning to the house the blinds which were drawn down during the ceremony should be pulled up.

For bodies that are cremated a somewhat different procedure is followed. An undertaker is secured and he will make many of the arrangements, but two doctors must view the body and give their certificates before the ceremony can be carried out. *See* Cremation; Death; Flowers; Mourning; Wreath.

FUNGICIDE. A fungicide is a preparation for killing fungus on trees and plants. Two that are recommended for fungus on fruit trees by the Ministry of Agriculture are Bordeaux mixture and lime sulphur at summer strength. Fungicides should always be applied as preventives rather than as remedies, as attacks by fungi develop very rapidly. The best way of preventing an attack is to cover the vulnerable parts of the tree, i.e. leaves, fruit, and young wood, with a fungicide, applied as a very fine spray.

Fruit trees should be sprayed with lime sulphur in February-March before the buds are advanced in growth. Amateurs are advised to purchase lime-sulphur concentrate from horticultural dealers rather than to attempt to make the mixture themselves, and to dilute it according to the directions. Bordeaux mixture is used just before the blossoms open and again as soon as they have fallen. If lime sulphur is used when the trees are in leaf a weaker solution is required or the leaves will be damaged. Spraying black currant bushes with lime sulphur from mid-March to mid-May at fortnightly intervals is the best way to get rid of big bud or black currant mite. Bordeaux mixture can be obtained in concentrated form, and then needs merely to be mixed with water.

Black spot and mildew on rose trees can be controlled by spraying the trees in mid-winter with sulphate of copper, one ounce in three gallons of water, by using Bordeaux mixture in March, and liver of sulphur, one ounce in three gallons of water, occasionally in summer. *See* Bordeaux Mixture; Fruit; Lime Sulphur; Spraying.

FUNGUS. This name is applied indiscriminately to parasitic plant diseases that are caused by spores. Fungous diseases such as apple canker, finger and toe disease, are dealt with under their respective headings.

Sometimes poisonous fungi are mistaken for edible mushrooms, with serious consequences. Some varieties are poisonous to all who eat them; others may be harmless to the majority of people and poisonous to a few, owing to some idiosyncrasy. Even edible mushrooms are indigestible, and may cause diarrhoea in delicate persons and children. They decompose rapidly and should always be eaten fresh. When mushrooms are cooked, set aside, and then warmed up again, they may be harmful owing to the development of poison.

It is not easy to distinguish the harmful from the harmless kinds. A Ministry of Agriculture pamphlet points out that certain tests are quite fallacious. For instance, it is widely believed that the contact of poisonous fungi tarnishes a silver spoon, that all fungi which grow on wood are dangerous, and that an edible mushroom may be known by the fact that the skin is easily peeled off. These beliefs are not to be relied upon.

Poisoning by Fungus. The symptoms of fungus poisoning may not come on for 10 or 12 hours, or even later; then there may be severe pain in the abdomen, followed by vomiting and diarrhoea. The muscles twitch, the skin becomes cold and clammy, the breathing rapid, the pupils of the eyes dilated and the face pale. In some cases nervous symptoms, headache, giddiness, etc., precede or take the place of those indicating irritation of the stomach and bowels. The heart gradually fails and the patient collapses. The case may run on to coma and end in death.

The doctor must be sent for at once, and meantime give an emetic. Use whatever is at hand, rather than have any delay.

A tablespoonful of mustard or two of salt in a large tumbler of tepid water answers admirably. If these are not available, give large draughts of lukewarm water, and tickle the back of the throat with a feather. Follow the emetic with a good dose of castor oil (1 oz. for an adult).

Keep the patient lying down in a warm room, and well covered with blankets. Apply cloths wrung out of hot water, or hot poultices, to the abdomen. Rub the arms and legs vigorously to promote warmth and prevent cramp. Give suitable stimulants, such as hot coffee, hot milk, hot brandy or whisky and water, or a teaspoonful of sal volatile in a wineglassful of water. *See* Brown Rot; Canker; Emetic, Mildew; Mushroom; Poisoning; Toadstool.

FURS: THEIR VARIETIES AND USES
The Choice and Care of these Valuable Garments

In this work our readers will find entries on all the popular furs, e.g. Chinchilla; Ermine; Musquash, etc.

The article on Rabbit is also of interest. See further Clothes Moth; Rug, etc.

The term furs includes fur coats of various kinds, necklets, animal ties, wraps, cloaks, eapes and muffs. Fur is also used for making collars and cuffs and for lining coats, gloves, and motoring rugs; another use is for trimmings and edgings, while felt hats are also made of it. Fur rugs, made chiefly from racoon, goatskin, sheepskin and white bear, are used on floors and as hearthrugs. More costly furs may be used for travelling rugs, and leopard, gazelle and wild cat skins are sometimes employed for upholstery.

While the retail price of furs varies somewhat according to fashion, and bargains can be acquired at special and summer sales, certain skins are always highly priced. The value of a fur skin depends upon the colour, texture and durability of the fibres of the underfur, and also upon the pelt. The coats of fur-bearing animals are at their best towards the end of the winter. The sea otter is ranked as a standard for the seven most precious furs; taking the wearing quality of this fur as 100, the other furs compare as follows: Seal, 75; sable, 60; silver or black fox, 40; ermine, 25; white fox, 20; chinchilla, 15.

If the best value is to be obtained, furs should be purchased from a reliable furrier. Imitation skins, so treated as to render them almost indistinguishable from the genuine article, are sold under a variety of names. Some of these skins are hard-wearing and, therefore, economical to buy, but others are apt to develop a worn and shabby appearance with undue rapidity.

Rabbit is used extensively as a substitute for seal, ermine, dyed musquash, sable, beaver, chinchilla, and nutria; goat is frequently made to represent monkey and bear; and marmot to represent sable and mink. Hare replaces sable and various kinds of fox; lamb is treated to look like nutria; nutria is used instead of beaver; while dyed musquash often imitates seal and opossum skunk. Sometimes, too, furs are skilfully topped as a means of disguising their real origin, or to enhance their appearance, as, for instance, when light sable is topped to give it the Russian sable colour. This process consists of brushing the top hair with a colour which imparts richness to the fur, while another device is to insert white hairs in the skin of a cheap fox to give it the appearance of silver fox. Badger hairs are used for "pointing" purposes.

Wide Choice of Furs

Furs of the hard-wearing order include astrakhan, badger, beaver, mink, goat, bear, seal, musquash, and skunk, but if grace is desired, then mole, sable, chinchilla, marten, fisher, broadtail, fox, and ermine may be selected. Where cheapness is the main consideration, rabbit, racoon, opossum, fitch, hamster, hare, marmot, Thibet, wallaby, and the smaller wolves are to be recommended.

For women of limited means fur coats should be selected very carefully. In mink or other expensive furs they are outside the usual range of price, but in cheap furs they are now within the reach of almost anyone. There are still, however, the considerations of the work of the sorter who matches the skins and of the cutter. At a good furrier's both sorter and cutter command high salaries and have acquired their art through long years of training and experience. A satisfactory fur coat cannot be cheaply priced if it is to preserve a good shape and appearance. Poorly sorted skins and badly cut garments of this type look ostentatious and clumsy The ideal fur coat is warm without being unduly heavy. Hudson seal, which is merely musquash deprived of the top hair, is a skin which makes up into comparatively light coats. It tends to split, however, and is therefore not so hard-wearing as might be desired. When a split occurs, the two edges of the leather should be brought together and oversewn at the back, while if the leather itself has perished a new piece of fur will be required. To carry out these renovations it will be necessary first of all to remove the lining. Where a cheaper coat is required, dyed coney or sheared lamb is chosen. Moleskin coats, while not suited to rough wear, are liked by some women on account of the colour and their supple quality when well made.

Fur buttons to match a fur coat can be made from odd pieces of the pelt sewn over ordinary large buttons and, if necessary, padded with cotton wool. The buttons should be attached to fur coats in this way: Sew a piece of black tape, just wide enough to pass through the shank of the button, along the leather for about 2 in. above where the first button is to be placed. A hole should be pierced for each button, and the shanks slipped through. Then push the tape through each shank and sew it firmly along between each button, finally stitching it for about 2 in. as at the commencement.

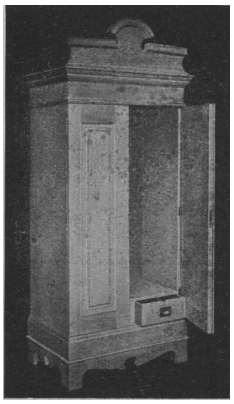
In the choice of furs the discerning woman will realize that fur should be chosen to suit her complexion and hair. Luxurious furs are all very well, but it may be that simpler furs suit her far better. Fox, too, is particularly becoming, but it is not durable.

Besides being made up into separate furs and into garments, fur is also used for trimming purposes. On winter coats or wraps of velour cloth and similar materials long-haired furs such as lynx or wolf may be used. Lighter furs, such as the various dyed conies, sheared iamb, foxaline and also sable, ermine and white or grey dyed fox are used to trim summer coats and evening wraps. Fur sets of collar and cuffs can be purchased unlined, and also trimming in various widths by the yard. It is in such sets and trimmings that the retail prices of furs vary most, according to the current fashion, as often these furs are of the cheaper kinds, dyed or shaped to suit the requirements of a particular season and of no lasting value.

While valuable furs which have become old-fashioned in shape are best re-modelled by a furrier, cheaper furs or odd pieces, if care is taken, may be cut at home. If a furrier's knife is not obtainable, a strong, sharp penknife should be used. The fur must be laid on a board with the skin uppermost, and the place where

the incision is to be made marked with chalk. While the cutting is being done, the fur should be held down firmly at each side. To join two pieces, place them together with the fur inside and oversew the edges. Do not draw the stitches too tightly or the fur will pucker.

Care and Storage. The care of furs is important, for proper treatment adds considerably to the length of time during which they will remain wearable. Natural furs wear best, because dye has a deleterious effect on the pelt or leather, though in some cases it is so slight as to be almost negligible. On the other hand, dyed furs are practically immune from the ravages of moth. Furs should be kept in the dark and hung up whenever possible. The fur should fall in the natural way, skins such as fox being hung from the head. Before putting on furs shake them vigorously, except in the case of such delicate skins as chinchilla. After wear, repeat the shaking process and go through the fur gently with a metal comb. Fur coats which have been rubbed on the under-sleeves or collars should also be combed after use.



Fur. Moth-proof wardrobe for storing furs, adapted from a cedarwood cigar cabinet.

Wet furs should never be dried before a fire. Hang them up, preferably in a draught, and when the moisture has evaporated shake and comb them with care. In addition to occasional sha-kings, the furs should also be beaten with a light cane and subsequently combed in order to keep them free from moth. The presence of the latter can be detected by patches of loose hair. Should these appear the furs are best sent to a furrier, for, though moth is not difficult to keep at bay when proper precautions are taken, it is not easily eradicated once it has actually started its destructive work.

The cleaning of furs may be done either by a professional cleaner or at home, though the former method is to be recommended in the case of valuable skins. Both bran and silver sand, when heated in a dish in the oven, make a good cleaning agent for almost any kind of fur, though sand should not be used on white fur. Either of these should be rubbed into the fur with the fingers, and afterwards brushed or beaten out. White and other light-coloured furs may be treated in the same way with warm powdered magnesia. Frequent cleaning can be avoided by wiping the furs with a damp towel after wear.

Fur hearthrugs require equally careful treatment, for they are quickly attacked by moth. In the summer they tend to make a room look too hot, and should therefore be removed in favour of cooler floor-coverings.

Cold storage facilitates the care of expensive furs during the summer months, and ensures immunity from moth. Furs bought at that time of year from a good furrier are usually stored free of charge till they are required. Special moth-proof bags are sold in which skins may be hung up while not in use, and are particularly useful in this connexion when the owner is away from home for a long period.

For home storage of furs a useful mothproof wardrobe can be obtained. The illustration shows a cedarwood cabinet adapted for this purpose, but which was originally made for packing cigar-boxes. Cedarwood, when permeated with the smell of the cigars, possesses moth-preventing properties and is of decorative value, either stained or natural. When required for storage of smaller furs, the shelves which originally furnish such cabinets can be retained. If these have been removed, as in the one illustrated, a wardrobe rail can be easily fixed or hooks for fur articles placed in bags to keep them free from dust. Whatever its wood, the cabinet for storage of furs should be absolutely airtight. Furs packed lying down in a chest or trunk may be protected by wrapping them in newspaper, turning the edges over so that they interlock. The chest or cabinet should contain either flaked naphthalene or paradichlorbenzene crystals, 1 lb. to every 10 cubic feet.

FURMENTY. This is prepared by boiling 1 quart of milk in a large saucepan over the fire, and putting 2 oz. of stoned raisins and the same quantity of cleaned currants in another pan containing just enough boiling water to cover them. Boil them for 5 min. until they feel soft and are well swollen, then drain off the water and add the fruit to the boiling milk.

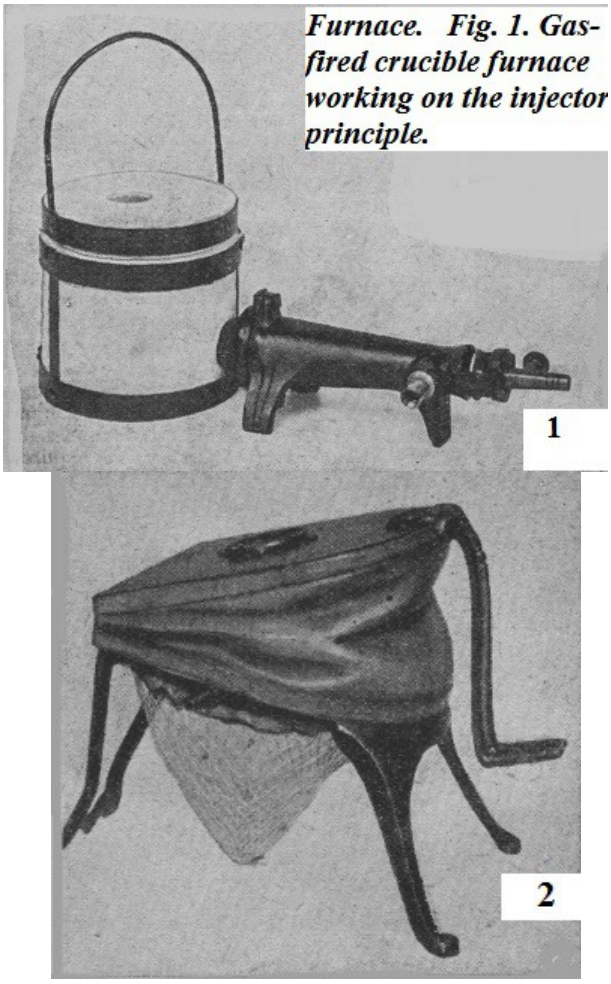
Add 1 teacupful of prepared wheat grains, 2 oz. of loaf sugar, and a little nutmeg, and boil all these ingredients for about 20 min. Then take the pan from the fire and let the mixture cool slightly, afterwards straining in 2 well-beaten eggs. Stir the whole again over the fire until it thickens, but do not let it reboil, add a little brandy or home-made wine, and pour the whole into a deep bowl, serving it cold.

In some districts prepared wheat can be bought by the pint at any confectioner's, but when it is not possible to purchase it in this way it can be made at home. Do this by soaking a pint of husked wheat in cold water for 24 hours, then put it, with a pint of clean cold water, in a covered jar in the oven. Bake it slowly till the grains are quite soft, and it is then ready for use.

FURNACE: How to Construct. A furnace is used to melt metal for casting, and in the article Casting are given diagrams and instructions for building a useful brick furnace suitable for cast iron or brass. The same article describes a furnace made up from standard fireclay bricks and heated by a gas blow pipe. A gas-fired crucible furnace, working on the injector principle, is shown at Fig. 1. In conjunction with the furnace a foot blower of the type shown in Fig. 2 is employed to furnish the necessary air pressure.

Muffle Furnace. A muffle furnace for the

enameller is readily made from fireclay bricks, built up as shown in Fig. 3. The furnace body is strengthened with iron bands, and a long chimney is provided to dispose of the fumes, and to create sufficient draught to cause the fire to burn well and fiercely. All joints must be luted with fireclay, and the whole well baked with the gas burner.

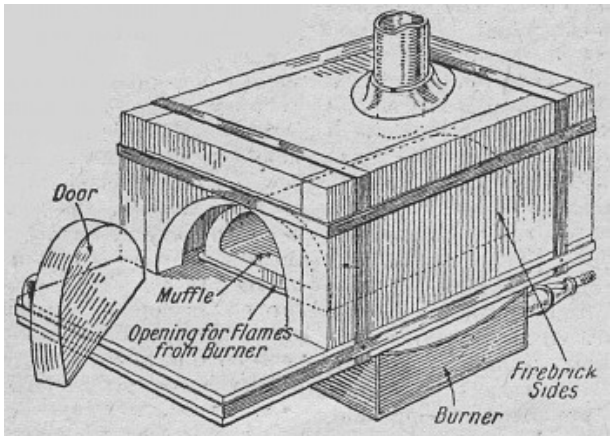


Furnace. Fig. 1. Gas-fired crucible furnace working on the injector principle.

Fig. 2. Foot blower used in conjunction with the furnace to give the necessary air pressure.

In this style of furnace the door is usually at the end and the flue pipe at the top. The burner is located beneath the furnace, the latter standing on short legs resting on a substantial base of some fireproof material, such as a firebrick or a sheet of asbestos on an iron plate. A hole is cut in the bottom of the furnace to admit the flames of the burner, and a simple damper regulates the amount of air admitted.

Fireclay bricks can be obtained from the ironmonger, who will also be able to procure the clay muffle to go inside furnace, the appropriate type of gas burner (Fletcher Russell & Co.'s) with gas and air regulators, and if desired a chimney with cast iron foot. The gas supply tap and pipe must be large enough to allow full pressure at the nozzle, and for the size indicated a half-inch supply is required. It is advisable to procure the clay muffle first and to make the furnace to suit it. Dimensions inside muffle for the furnace in question might be 4 in. long by 2 in. high by 2 in. wide. For a larger size a ⅝ in. supply pipe would be needed, when muffle might be, say, 9 in. by 4½ in. by 5 ⅜ in. *See* Boiler; Casting; Enamelling; Fireclay, etc.



Furnace. Fig. 3. Diagram showing construction of gas-heated muffle furnace for the amateur enameller.

FURNISHED HOUSE. In London the best letting seasons are in the winter and during the late spring; at holiday resorts, unless also winter resorts, during the summer months. The houses are let furnished from month to month, or for three months or even longer, as the case may be. In July and August, when most people take their holidays, the highest prices are obtained at holiday resorts, but June and September are busy months, while early lets are arranged for May; in some sheltered spots the season lasts into October.

There are two ways of letting a house. The tenant may carry out the business himself either by advertising or by private treaty, thus saving an agent's commission and other incidental expenses. In most cases, however, it is usual to entrust it to an established firm of house agents. The agents charge a small commission on the whole transaction, that is to say, on the total amount eventually realized by the let. They undertake no responsibility for default on the part of the visitor, but any risk is minimized by the stipulation for payment of half the various instalments of rent in advance.

The first step is to enter in the agent's register of houses to let, the rent required, and particulars of the accommodation available. This is intended for the information of visitors on the look-out for houses, who call on the agents and are invited to see if there is anything in the register that will suit their requirements. In this manner the tenant gets in touch with prospective clients, and after that it rests mainly with the principals to come to terms when the premises have been inspected. The final step is the signing of an agreement drawn up by the agents, the cost of which is shared by the parties. Under this agreement the visitor binds himself to take the house for the term and at the rent agreed upon, the tenant paying all rates and taxes.

If any rooms are unfurnished or partly furnished,

which are occupied or used as store rooms, care must be taken to see that they are not included in the number of bedrooms and sitting rooms entered in the agent's book. This is important because if any mistake is made in this respect the tenant may be called upon to furnish the room or make a reduction in the rent.

Preparing the House. One of the first considerations in getting a house at a seaside resort ready for a family with children is to arrange it so that it can be easily kept clean. From this point of view linoleum is to be preferred to carpets and rush mats to carpet mats. In case of accident it is always advisable to put away the things that are most valued amongst the household goods, especially silver, china and other valuable ornaments. Unless by special arrangement plate and linen are never included, and they should be carefully put away. Glass, china and blankets are counted as necessaries, and reasonable supplies of these should be provided, together with all that is necessary in the way of kitchen utensils. Gas or electric fittings must be in good working order, and the same remark applies to blinds, curtains and door locks and any labour-saving devices.

Where the meter is not on the slot system, the gas company ought to be notified of the change, so that the meter can be read, and the tenant pays for the gas he has consumed up to the date of his departure.

If the garden is any size, and has been well cultivated, the tenant may undertake to see that it is kept in order, and make a charge for his trouble, unless the upkeep of the garden has been included in the rent. It is more usual for the visitor to make his own terms with the gardener, but he is not under any obligation to do so, and the tenant should be careful to stipulate for the upkeep of his garden upon making the agreement. The latter document should also contain a clause forbidding the newcomer to take in lodgers or to sublet the house or any portion of it. *See* Agreement; Cottage; Holidays.

FURNITURE AND FURNISHING

Good Taste and Economy in the Equipment of the Home

Other general information on this subject will be found under the headings Colour; Decoration. See also Antique Furniture and articles on the various styles, e.g. Chippendale; Tudor; and those on the rooms and pieces of the home, e.g. Bureau; Chair; Kitchen; Nursery.

While modern furniture is undoubtedly a good choice for small rooms in the average flat that is to be newly equipped throughout, there is still a strong feeling for antique styles in furnishing period houses. The great thing is to choose such styles with a nice appreciation of their suitability to their surroundings. In old days no one worried about period. As new pieces of furniture to meet the current modern need were designed, so they were gratefully acquired by the rich and comfortably settled in the same room with the pieces of former years.

Each acquisition was an event as important as the entire redecoration and refurnishing of a house to day. It is still really far more important to acquire pieces to suit individual needs and to blend colours, shapes, woods and metals harmoniously, than to try to live in the uncomfortable replica of a room only suited to the life of many generations ago. On the other hand there are reasons for selecting certain periods to inspire furnishing schemes, the chief of which is the type of the house. One may possess antique pieces and good reproductions, but while there are so many modern decorative schemes in which such pieces can be pleasantly set, it is far more difficult to reconcile furniture having metal tubing frames and table surfaces of glossy enamel or glass to a Tudor setting, than to utilize successfully a refectory table and oak stools in a modern dining room with painted walls and a rubber tiled floor.

The Oak Period. As many small houses of to-day are based on the 16th and 17th century cottage and farmhouse type, it is useful to remember that the oak period in antique furniture coincides roughly with the Tudor and Jacobean periods in architecture, and therefore oak is in harmony with low-pitched ceilings and visible beams, brick fireplaces and casement windows. Those who wish to furnish after the style of the 17th century have to-day two special conditions with which to contend. They cannot own much genuine old furniture of the period, and are likely to feel tied when trying to equip the whole house to correspond, as they cannot be limited to furniture which was sufficient for a household of 300 years ago. They have to remember that in early Jacobean times there was no electricity available, no gas, no sanitary arrangements, and very few carpets.

Some people solve the problem rather wisely by confining one period, such as the Jacobean, to one or two rooms of the house. For instance, a Jacobean hall and even a dining room, in spite of the limited space of to-day, are possible to furnish with some degree of success. A carved oak chest is perfectly at home, and forms a very useful receptacle for rugs and other articles. The Jacobean chair, with its hard wooden seat, almost upright back, and straight legs, is right in the hall, and, when cushioned, quite suitable at the table, but scarcely in a living-room where comfort and ease are demanded. The court cupboard or buffet—both terms are correct—makes a picturesque feature.

The small gate-leg table is more appropriate in the hall than in the dining room, because of its limited top accommodation and inconvenient underframe, which renders it awkward for the legs and feet of diners. An excellent casement window treatment for either Tudor or Stuart period style hall is given in the article on Curtains.

If the dining room is to be furnished in this style, some liberties must be taken. It may have a late 17th century dresser as a sideboard, and the dining table, for the sake of comfort, should be a refectory or an

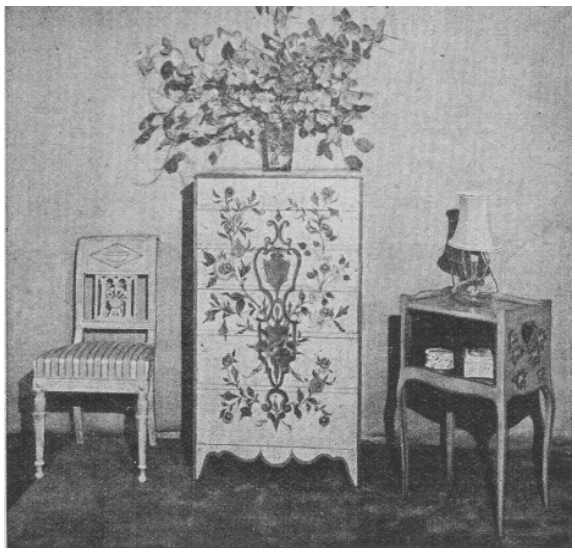
extending one with centre rail beneath, but built on the lines of the old draw-table. This table, of which there are many made to-day, is quite in keeping with the Jacobean tradition, while being more comfortable and convenient for a small room. It was common in the 16th and early part of the 17th century for diners to sit upon stools placed down the sides of the table. This fashion appears to-day in small dining rooms (q.v.) In larger rooms tall cane-backed chairs usually associated with the period of the Restoration are often seen, upholstered in velvet or tapestry and often with fringe to trim the chair seats. The dining room (and hall) may have a stone-flagged floor to all appearances. In reality it will be made of composition which is quiet to the tread and warm to the feet. Rugs of old Persian designs may enrich this flooring. Parquet is more ordinary with a carpet of Oriental type. In this room no mahogany should be used, for it was not employed in the 17th century.

There is something to be said for the use in such a dining room of definitely modern armchairs and settee upholstered in brown velvet and leather, as they do not clash with anything. Leather was a common material for the finishing of chairs in the 17th century. A piece of furniture that well may be included in an oak room is the bureau; though still existent, specimens are very rare of earlier date than the end of the Stuart period, but the bureau was made of oak in Cromwellian times, and good reproductions are easily obtainable.

The Walnut Period. A drawing room furnished in the Jacobean style is not correct, as such a room was unknown at this period. With the arrival of William III and Dutch domestic ideas after the changes of 1688, furniture undoubtedly took upon itself a more comfortable and pleasing aspect. Tall sash windows were used more generally, houses became formal in plan and elevation, rooms squarer, and chairs and tables were made frequently of walnut, and showing graceful curves in their structure. The William and Mary period saw the arrival of the parlour, and the alteration in social habits, particularly the introduction of tea as a popular beverage, influenced furnishing in the direction of leisured grace and comfort. Upholstered chairs, showing very little wood, began to appear, and the grandfather chair and clock are typical of the time. The picture of a room in the William and Mary or Queen Anne period is one of quiet restfulness and homely charm. The walls had broad panels, often of walnut with gilt enrichments, conferring greater dignity than was usually seen with the smaller panels found in Jacobean and Tudor interiors.

Inasmuch as the old parlour suggests general social functions, and not specific use like the dining room, it is the model for the furnishing of the drawing room, or the more gracious type of living-room of to-day. The Queen Anne parlour was eminently serviceable, comfortable, and homely, yet it had a sense of style, and symmetry, which appeals to-day as much as it did then.

The articles suitable for rooms furnished in accordance with the walnut period include a round tea-table, chairs, with and without arms, having seats covered in needlework or brocade and concave splat backs, a china cabinet, or a niche with fitted shelves each side of the fireplace, a bureau, one or two tabourets or footstools, a chest of drawers, a dresser which is without cupboards, a folding card-table, and a small settee which was practically a double chair, with two splats divided by a smaller one, outwardly flaring arms and six cabriole legs, known as a courting-seat. The whole of this furniture may be in walnut, and a suitable colour for the hangings of a room in which it is placed would be green, though maroon, blue or yellow were often used.



Furniture. Fig. 1. Group of modern painted furniture showing inspiration from both Queen Anne and Georgian styles, but blended by colour for use in the same room.

The beds of this period had very tall posts, and they were fitted with voluminous curtains, with shaped lambrequins (festooned drapery) above. The bed itself was low, within a foot or eighteen inches of the ground, and the posts were not highly decorated. Furniture made in cheaper woods was often painted and lacquered. Gilding and inlay were also used. Lacquered leather screens, with six folding panels, were a decorative feature.

Modern versions of such pieces and accessories are often seen to-day. Fig. 1 shows a group of charming painted furniture. The bedside table and chest of drawers show the earlier influence of Queen Anne designs, while the chair, though reminiscent of the later and more classical Adam period, blends happily. The walnut period extended in the main from about 1685 to 1713.

The Mahogany Period. Through the discovery of the value of mahogany for furniture making, the 18th century may be said to be dominated by mahogany as far as furniture is concerned. With the commencement of the age of Chippendale, which can fairly be placed

between the end of the first quarter of the 18th century and the commencement of the wars with France (1793), furniture followed in the main the French tradition, becoming lighter and more elaborate in ornamentation.

To possess a home which shows almost throughout inspiration from the mid-Georgian period is simple, for furnishing houses have reproduced Chippendale, Hepplewhite, and Sheraton furniture in vast quantities. On the whole, these reproductions are good in design, and constructed on simple lines, avoiding over-elaboration of carving, and usually selecting the plainer examples as models. Bedrooms, based on those of the late 18th century, often show inspiration from the work of Hepplewhite, and the four-post bed itself, with its fluted columns, is copied. Sanitation, indeed, had not yet arrived at a constant supply of hot and cold water, and the bathroom had yet to make its appearance. But there were small washstands and dressing-tables which combined picturesqueness with that utility and convenience of which to-day we avail ourselves. This bedroom furniture gradually became the Victorian suite, made up of a wardrobe, dressing-chest or dressing-table, with or without a washstand, and one or more single chairs.

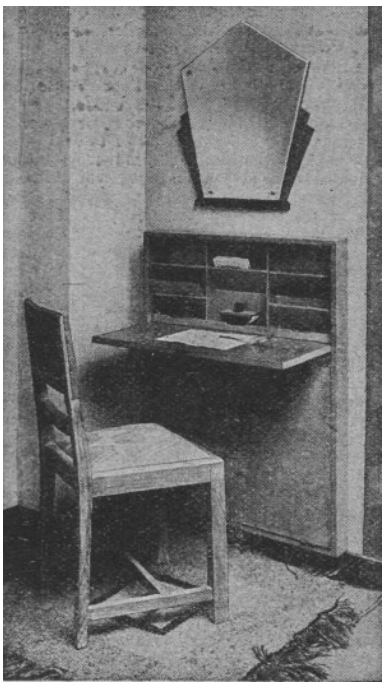
A bedroom equipped with furniture of the Hepplewhite or Sheraton period, roughly the last quarter of the 18th century, should avoid the suite, and may properly include, beside the bed itself, a tall-boy, or double chest of drawers, a man's wardrobe, basin stand, folding-topped dressing-table, separate mirror, wing easy chairs, and oddments such as screens and hanging shelves. Until the 19th century it was the custom not to hang dresses, but to lay them flat in drawers. Hence the tall-boy, which gave extensive drawer accommodation, and the wardrobe fitted with trays.

It has taken more than a century to bring the sideboard, in structural essentials, back to what it was originally. In early Georgian days a side-table, it became a complete sideboard with flanking cupboards and centre drawers during the last quarter of the 18th century, and gradually developed in size and importance until in the Victorian age it was almost a domestic altar, and occupied much room. The high back was practically unknown before the reign of William IV, but all through the 19th century it was part of the conventional sideboard.

To-day, in conformity with English period furnishing and also with the best modern ideas, it has shrunk to relatively sensible proportions for the size of rooms.

The Modern Period. A great advance has been made in the structure of upholstered chairs and settees, which are more comfortable now than ever before. The principal reason for this is the development of the use of wire springs and mesh and the consequent increase of durability and resilience. These circumstances have also affected the production of the modern mattress, which has made the bed of to-day much more comfortable than before.

Divan beds are favoured because they look decorative in the daytime if attractively covered and cushioned. Heads are constructed with fittings which serve as bedside tables and bookshelves in accordance with practical ideas of dual purpose furniture for smaller rooms. For furnishing the modern small house various pieces of "double duty" furniture can be obtained, such as a compact sideboard with a writing slab which can be pulled out and is stowed away when not in use, in place of the usual drawers above the cupboards; there is also a dining-table with a sliding top beneath which is accommodation for cutlery in baize-lined partitions. The illustration of a small bureau wall fixture (Fig. 2) depicts a particularly useful and space-saving idea. The chair and mirror also shown are examples of good taste in modern furnishing for small rooms.



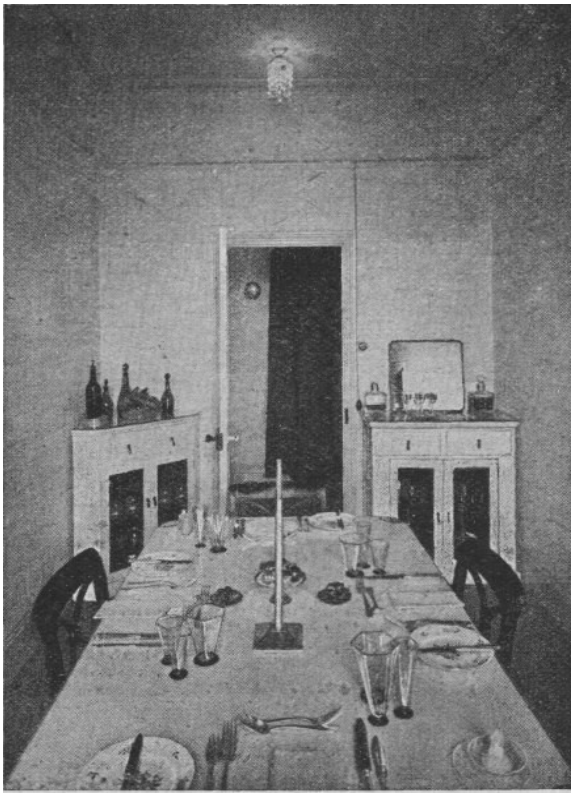
Furniture. Fig. 2. Space-saving bureau wall fixture. The flap folds up and the thickness of the piece is then 3½ in. The flap below conceals space for magazines (Courtesy of Rowley Gallery).

Very practical built-in furniture is a great feature of modern furnishing. Fig. 3 shows a dining room with a built-in sideboard and a glass cupboard. The table in this illustration cannot be appreciated without the colouring. The glass top could be carried out in various beautiful shades—a sea-green, for instance, with table glass in amethyst and the beautifully de signed candlesticks in crystal with a purple line and mauve or silvered candles. The corners of the table are chromium plated, this finish is repeated in the handles of the fixtures and doors. The chairs unexpectedly hark back to a Regency style, but seem quite at home in company with the lace trimmed mats, the china, cutlery and lustre central lighting fixture.

Modern style is essential in the kitchen. In many of the newest abodes it is small, yet replete with all that is required for the business of cooking. Everything that saves labour and unnecessary expenditure of coal, gas, and electric power is in it. Cookers that are convenient and economical; sweepers that excel in the task of cleaning rooms and furniture; cupboards for brushes to hang in; washing machines, square aluminium saucepans which can be packed in the minimum amount of space, and good lighting, all combine to help

the work of the kitchen.

Restraint is shown in the amount of glass, china, and linen with which people set up house nowadays. Sets of breakfast, tea, and dinner china are chosen, all of one pattern, so that the vast number of plates needed with varying designs may be cut down.



Furniture. Fig. 3. Modern dining room furniture designed for a small flat. The austerity of the fixtures and glass-topped table is softened by beauty of colour and accessories.(Humphrey & Vera Joel)

Two pairs or one and a half of blankets for each bed, three of sheets and half a dozen pillow-slips, a cotton or silk spread, and a down quilt may be considered a generous allowance in an ordinary house. Towels and household cloth's, as well as these other items, should be of the best quality that can be afforded; cheap ones are false economy.

Glass has, in a great measure, taken the place of silver, because it is more easily cleaned. The use of stainless steel has increased, while chromium plating gives a bright appearance to lighting fittings, mirror frames and hearth furniture. Unnecessary ornaments are avoided.

The nursery is the apex of charm and cheerfulness, and in many homes the best and largest rooms the house provides are dedicated to day and night use for the children. Furniture made of enamelled or of closely grained, unpolished and unstained wood, with rounded corners and handle knobs that cannot hurt the baby on adventure bent, is used. Round the top of the day nursery wall, where they can be seen when not in use, the children's big toys, are placed, instead of being cupboard-bound in an untidy mass. Wardrobes are provided with hooks low enough for the small child to reach, so that the virtue of putting things away directly after use can be inculcated early in life. Little low chairs and tables are added, and that invaluable item the play pen.

Another particularly well plenished apartment is the modern bathroom, with real or closely imitated washable tiled walls, tables with glass tops, and a floor of rubber tiling or cork parquet.

The Care of Furniture. The beautiful appearance which distinguishes really well-kept old furniture is due, in the main, to two circumstances. It has been shielded from rough usage, and it has been regularly cleaned with the familiar preparation called elbow-grease.

The kind of polish used for any wooden furniture is of comparatively small importance, for none of them is effectual without regular use and vigorous application. None of them will achieve its purpose by a liberal allowance and little rubbing. Beeswax and turpentine is a mixture which, though very old-fashioned, is perfectly safe to use on any wood, and in this connexion it should be remembered that it was the only preparation used by scores of housemaids who, through years of labour, produced that delightful patina we admire so much to-day on old furniture. On the other hand, preparations under various names are reliable, provided they are not taken as substitutes for regular rubbing with a linen cloth.

One of the worst marks and most difficult to remove is the circular stain left by carelessly used glasses in which hot liquid has been served, and it is worth remembering that the more brilliant the polish of the table top the more permanent appears to be the mark. The reason for this is that a fine polish is really a very attenuated film or gloss over the surface of the wood. This film is only obtained after an immense amount of labour. Alcohol or hot liquid will destroy it, and in the case of french polish only one method will put the matter right. This is to have the whole of that portion of the table-top glass-papered down and to repolish it afresh. The colour may be restored to varnished or wax-polished surfaces by treating them with linseed oil (q.v.). Ash and deal topped tables, such as those used in kitchens, can always be well scrubbed with soap, sand, and hot water, and the harder they are rubbed the better.

Blistering of Furniture. Occasionally inlaid furniture will cockle. That is to say, the thin veneer will come up here and there in a blister, and it cannot be remedied except by a cabinet maker, who may remove the veneer and re-glue it under pressure. This blistering is caused often by furniture standing too near a radiator, or sometimes damp will swell the wood and cause the trouble. It is curiously true that houses heated by radiators are more likely to damage furniture than those heated by the open fire, notwithstanding the variability in temperature arising from the older system. The explanation appears to be that heat from radiators draws the moisture from the

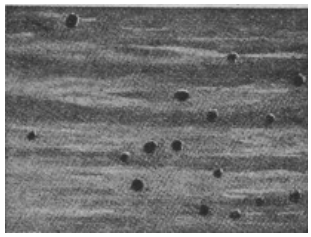
wood, causing it to warp and split. Furniture requires fresh air in England, for the wood is not dried to stand great heat as is the case in hot countries.

A weak solution of oxalic acid will clean leather coverings, but all preparations should be very sparingly used, and leather should not often have anything applied to it, or it is liable to become sticky. Horsehair seats should never be re-covered over the old cover, which should be removed and the stuffing taken out and cleaned before stretching a new covering over.

FURNITURE BEETLE. Several species of beetle that in a state of nature reduce to powder the dead, dry branches of trees have taken to the destruction of woodwork in the house—rafters, floorboards, and furniture. They are all very small, longer than broad; their breadth may be judged by the tiny holes which mark their exit from the burrows they eat in the wood whilst in the grub stage. The females search for a crevice in which to lay their minute eggs, and when these hatch the grubs at once begin feeding in the wood. The presence of these pests is usually indicated by a fine powder escaping from the holes in the wood.

Furniture Beetle.





Worm-holes in deal flooring (natural size) made by the furniture beetle. (British Museum of Natural History)

Remedies are very difficult in application. Dry heat of about 130° F. is perhaps the most certain way to destroy the grubs, and if the article affected is sufficiently small the ordinary gas-cooking oven will serve for the purpose. In the case of fixed woodwork and large furniture the apartment must be made absolutely airtight, when it may be filled with the vapour of carbon disulphide or hydrocyanic acid. The latter is a deadly poison and the former, though less dangerous a poison, will explode on contact with a light. Naphthaline in liquid form may be injected into the holes, but it is a tedious operation if there are many of them; or corrosive sublimate dissolved in methylated spirits may be substituted where the odour of naphthaline is an objection. *See* Antique Furniture; Sideboard; Wood Worm.

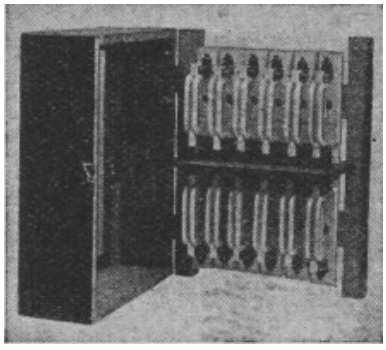
FURNITURE CREAM AND POLISH.

Beeswax and turpentine together form an excellent polish for furniture. Shred the beeswax and add as much turpentine as will dissolve the wax to a moderately thick solution, or, as an alternative, add ½ oz. camphor to a bottle containing a pint of turpentine. Let the latter mixture stand for 24 hours before adding 2 oz. finely shredded beeswax. When this is dissolved the polish is ready for use. Neither of these polishes should be made on a stove or close to a fire. Paraffin and turpentine or linseed oil, turpentine and methylated spirit mixed in equal quantities, provide other satisfactory polishes.

A good reviver for furniture which has been somewhat neglected is made from ½ pint each turpentine and linseed oil, and ¼ pint each brown vinegar and methylated spirit. Put these ingredients into a bottle, shake them well, and let them form an emulsion before using. *See* Antique Furniture; Spring Cleaning.

FURRING: In Building. Furring is the process of nailing small strips of wood to joists, rafters, wall surfaces, or any other part of a building, to form a level surface whereon to fix laths or building boards. The same expression is applied to packing pieces of timber which are employed to bring uneven pieces of carpentry work to a regular surface, as, for example, the packings under joists, to bring the top surfaces level. Short pieces of timber attached to the ends of the rafters of a roof for carrying the eaves beyond the surface of the wall are also known as furrings. Usually furrings are of quite small section, often about 2 in. wide and ¾ in. thick, and in the case of preparing a wall surface for covering with building board it may be necessary to pack out the furring strips so that their faces should be level.

FUSE: How to Replace. An electric fuse is a short length of thin wire of an easily fusible metal which is inserted in the electric circuit as a protection against fire. The current causes heating of the lamps or apparatus and also of the wires and cables, but there is no danger under normal circumstances. If, however, an excessive amount of current flows the heating may approach the limit, when danger from fire will result. Being of an easily fusible metal, the fuse reaches melting point earlier than the other parts of the circuit, and thus breaks the circuit, so that no current can flow.



Fuse-box, showing detachable safety fuse holders.

Where the cables enter a house two sealed fuse boxes with glass fronts, one for each cable, will be found situated on the company's side of the meter. These fuses are not to be touched by the consumer. If they happen to fail, he should ring up the company to send and replace them. Next to the meter on the consumer's side comes the main double-pole switch, consisting of two large

tumbler switches connected by a wooden bar so that both work together.After the switch comes a pair of consumer's main fuses, through which the whole house supply passes; next comes a batch of three or more pairs of fuses, each pair carrying the current for a section of the house; and finally there may be a number of smaller fuses, which are often away from the other fuse-gear, and control single rooms.

In the event of the sudden extinction of a group of lights, the first thing to be done is to find and examine the fuse which has gone. If the fuse shows signs of heating and appears simply to have melted, one may suspect the cause to be gradual deterioration of the wire through long use, and a new piece of fuse may be substituted. Should the wire have disappeared, except for some blobs of melted metal, a definite fault on the affected circuit must be looked for before attempting to insert a new fuse. The cause may be a short circuit due to a mistake made in wiring some fitting which has been receiving attention, or perhaps the insulation on a hanging flexible has become frayed, thus allowing the bare wires of the two leads to touch and form a short circuit. After the cause of the trouble has been removed, the house must be entirely isolated by opening the main double-pole switch, when the melted fuse can be replaced by a new one. The ends of the burnt fuse will afford a guide to the proper size.

It is important to use the same size fuse-wire as before when replacing a fuse, as a larger size may be an infringement of the wiring rules approved by the fire insurance company, and thus may even invalidate the fire policy. The operation consists in cutting off a suitable length of fuse-wire and laying it in place with the ends wrapped round the terminal screws, finally securing the ends by screwing down the terminals, but not hard enough to cut the soft fuse-wire. *See* Electricity.

FUSTIAN. Although the name is applied to the whole class of heavy corduroys and moleskins, fustian means more specifically the dense, heavy cotton cloth with a smooth, leathery face that is much employed for making labourers' trousers. Drabs and browns are the colours most commonly in use, although others can be obtained. Fustian also makes an excellent material for covering chairs and stools.

GABARDINE. Raincoat cloths of various kinds are known as gabardines. Chiefly twill-woven, some of them are plain-weave, and are of cotton, a mixture of wool and cotton or all-wool. Those which are close-textured are best. Fawns, drabs, greys, slate, smoke, and similar self and mixture shades are the predominant colours.

Certain wool cloths of a twill or whipcord character and designed initially for raincoats are employed for dresses and tailor-made costumes.

Gabardine is made chiefly in 54 in. width. White or cream gabardine in heavy weight, either in all wool or with a cotton weft, makes an alternative to flannel for cricket and tennis trousers, and is less liable to shrink.

Before being made into raincoats gabardine is submitted to a process which causes rain to run off the surface without wetting the cloth. Rainproof gabardine, unlike mackintosh, is not spoiled, but actually improved, by being dried in moderate heat before a fire. Grease and soap are very destructive of this rainproof property. Cotton rainproof gabardine in the best quality, and made from super-combed Sea Island cotton, wears well, but soon becomes dirty in towns.

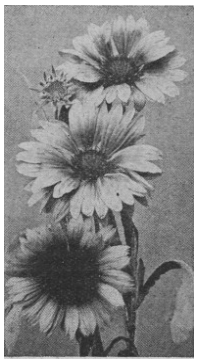
GABLE. Properly speaking, the gable is part of the outside wall, having a triangular form, which rises above the level of the roof line. The gabled roof is the only alternative in an ordinary house to the hipped roof, the latter meaning a roof that is returned round the end of a building. *See* Bungalow; House; Roof, etc.

GADROON: For Ornament. This is a fluted ornament. It consists of a flowing reeded form, short for its width and rather oval or egg-shaped. It is often seen on the edges of tables, and is frequent on pieces made by Chippendale. It is also found on articles of silver and Sheffield plate.



Gadroon. Example at base of a Sheffield-plate candelabra (Courtesy of Chapple & Mantell).

GAILLARDIA. These are very showy annual and perennial plants with large double or single blooms, chiefly in shades of yellow and crimson. The perennial varieties are liable to perish in winter on heavy, clayey land, and it is usual to treat them as bien-nials by sowing seeds every year in June, either out of doors or in boxes of soil in a frame. Cuttings may also be inserted in a frame in August. Except on light or well drained soil it is wise to winter both seedlings and cuttings under glass and to plant them out in May. Some of the finest up-to-date varieties are Mrs. Bateman Brown, Tangerine and Mrs. McKellar. The flowers are long-stemmed and useful for cutting. The annual gaillardias are raised from seeds sown under glass in March, the seedlings being planted out of doors in May. These plants are useless after having flowered. Pron. Gã-lar-di-a.



Gaillardia. Showy yellow and crimson blooms of gaillardia.

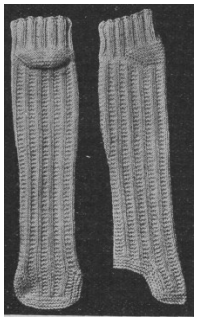
GAITERS: How to Knit. Gaiters can be had in various materials, as, for example, in leather, black oilskin, and waterproof cloth, but they may also be knitted in wool. Leather gaiters may be cleaned with boot polish, and those of oilskin washed with a cloth

dipped in warm soapy water.

A knitted pair, designed for a child of 2-4 years, can be made according to the following directions. Width is given by means of the expansive rib in which they are worked, and extra length can be added to make them suitable for an older child of 4 to 6 years. The materials required are 3 oz. of 4-ply Beehive Scotch fingering wool, and two No. 10 bone knitting needles. Half a yard of elastic about ½ in. wide will be required for the straps which go under the instep to keep the gaiters in position. For a larger size use 5-ply fingering and No. 8 bone needles, and knit extra length before shaping for the ankle.

Beginning at the top of the gaiter, cast on 48 stitches. 1st row: Knit 4, * purl 2, knit 2; repeat from * to the end of the row. Repeat this row for 1½ in. for the welt which comes above the knee. Now begin the knee shaping. Knit plain up to the last 12 stitches, then turn and knit back 24 stitches; turn again and knit 23 stitches; turn and knit 22; turn and knit 21. Continue in this way, knitting one stitch less each time until only 12 stitches remain on the last short row. Now turn and knit all the stitches on the needle; turn again and knit first 2 stitches, then purl to within the last 2 stitches, which knit. This completes the knee gusset.

The pattern for the leg begins as follows. 1st row: Knit plain. 2nd row: * Knit 2, purl 2; repeat from * to the end of the row. Repeat the last two rows until this fancy rib pattern measures 4 in. long. Here extra length can be knitted for a taller child before shaping the ankle.



Gaiters. Pair of child's knitted gaiters with knee gusset.

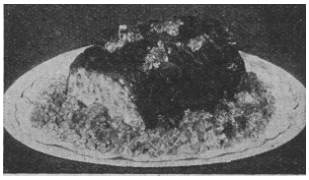
Shape the leg by decreasing one stitch at each end of every second row until there are only 40 stitches left. To decrease at the beginning of the row, slip the second stitch, knit the third, then pass the slipped stitch over the third stitch. At the end of the needle knit until within three stitches of the end, then knit two stitches together, knit the last stitch. Continue without any further shaping until the gaiter is long enough to reach the ankle (in the gaiter illustrated 4¾ in.), then work the instep. Knit 12 stitches in the rib pattern, then on the next 16 stitches only, knit for 1½ in.; this makes the instep tab. Fasten off the wool very securely but still keeping the stitches on the needle.

Now go back to the point where the last 12 stitches were knitted before the instep tab was begun, and after the 12 stitches pick up and knit 9 stitches along the side of the instep tab, knit across the 16 instep stitches, pick up 9 stitches on the opposite side of the tab, and knit the remaining 12 ankle stitches. Work six rows on all these stitches in plain knitting, and cast off rather loosely. Press the gaiters on the wrong side, putting a thin damp cloth over the knitting, then sew up the back seam and sew elastic at each side in position so that it will just fit under the instep of the shoe. *See* Knitting; Sock; Stocking.

GALANTINE. This cold, glazed dish is prepared from boned meat, poultry, or game.

A good breakfast galantine can be made by removing the skin and gristle from 1 lb. of raw topside of beef and the rind from 6 oz. of raw, streaky bacon. Chop both finely or put them through a mincing machine; then place them in a basin with 6 oz. fresh white bread-crumbs, 2 beaten eggs, and 1 gill of good stock. Season, then pound the mixture gently, either in a mortar or with the end of a rolling-pin. Turn the whole on to a pastry-board, shape it into a roll, tie it up in a floured cloth, and boil it gently for two hours in stock or water flavoured with onions, turnips, carrots, or other root vegetables.

When cooked, lift, and after removing the cloth re-roll it and press it between tins until it is cold. Brush over the top and sides with 2 coatings of glaze, letting the first dry before applying the second. Trim the ends, lay the galantine on a dish, and garnish it with aspic jelly. *See* illustration.



Galantine of boned meat, an appetising breakfast dish.

Chicken Galantine. To prepare this, bone one large chicken *(see* Boning) and remove the skins from 6 pork sausages, seasoning the latter with salt, pepper, and grated nutmeg. Cut ½ lb. ham and 2 hard-boiled eggs into strips, place the boned fowl on a table, and spread a layer of sausage meat all over the flesh. On this lay alternate strips of ham and egg. Cover the whole with more sausage-meat, then roll up the bird from side to side like a roly-poly pudding. Tie it up in a clean pudding cloth, and then put it, together with the bones, in a stockpot half-filled with water. Let the whole simmer for about 1½ hours, and when it is cooked, re-roll it tightly in the cloth, placing it between two tins or dishes. A good plan is to put heavy weights on the upper one in order to press the meat.

Leave the bird to get cold, and in the meantime prepare a sauce by melting 1 oz. butter, stirring into it 1 oz. flour, and cooking the two over a gentle heat for 5 min. Add ½ gill milk and ½ pint of the chicken stock, stir the whole until it boils, and then let it simmer gently for 5 min. Season the sauce carefully with salt and pepper, strain into it 2 teaspoonfuls lemon-juice, and let it cool slightly before adding 4 sheets of gelatine previously dissolved in 1 gill of hot water, Reheat the sauce carefully, put it through a hair sieve, and when it has cooled stir in 1 gill of cream. Then pour it evenly all over the chicken, and leave the whole to set, afterwards placing it on a dish with a border of chopped aspic arranged round the edges. If a cheaper dish is preferred, all milk may be used in place of the cream.

Veal galantine is made in the same way, using the same stuffing, but it is glazed in the same manner as

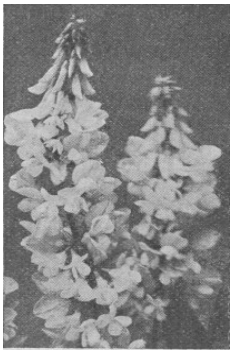
the beef galantine after pressing.

Nut Galantine. A vegetarian breakfast dish is made by shelling and blanching 3 oz. of nuts, skinning them and putting them through the mincing machine. Add ½ lb. breadcrumbs, or potatoes, a finely minced onion, and a teaspoonful each of chopped parsley and mixed herbs. Season well and bind with white or tomato sauce, and the beaten yolks of two eggs. Make into sausage shape, put into a scalded floured cloth and tie securely, before placing it in boiling water and letting it simmer for 1½ hours. When done, press and glaze as for beef galantine.

GALATEA. Made for nurses' uniforms and house dresses, galateas are strong twill cottons generally striped in blue and white and sometimes in red and white. Hard-twisted yarn and fast colours are employed in the manufacture, and they may be recom-mended for very hard wear. Pron. Gal-la-tee-a.

GALBANUM. This is a gum resin, greenish yellow in colour and with a disagreeable odour. It may be used as an expectorant, in doses of 5 to 15 gr. The compound galbanum pill, also known as the compound pill of assafoetida, as it contains both drugs, is used in hysteria.

GALEGA. (Goat's Rue). This is a vigorous, hardy, herbaceous perennial which bears bunches of pea-shaped flowers in summer. It flourishes in ordinary soil and is increased by division or by seeds in spring.



Officinalis and Har11andii, pale lilac, and officinalis alba, white, are the chief sorts; they reach a height of about 4 ft. These plants take up a lot of room and therefore are scarcely suitable for small gardens.

Galega or Goat's Rue, which bears lilac-coloured, pea-shaped flowers in summer.

GALL. This is another name for the bile, the excretion of the liver (q.v.). The name is also used for the excrescences on the oak, Quercus infectoria, which is produced by the eggs of an insect.

Gall Ointment. This is an astringent ointment made by rubbing up powdered galls with benzoated lard, and is chiefly used for haemorrhoids or piles. When there is pain in this disorder the gall and opium ointment is better. *See* Piles; Tannic Acid.

GALLIC ACID. This substance is found in tea and other vegetable products. It is an astringent and acts like tannic acid, from which it may be obtained by boiling the latter with dilute acids, e.g. sulphuric acid. The dose is 5-15 gr. It has been used for arresting internal bleeding, and is useful for the night sweats of phthisis, and in chronic diarrhoea, etc. *See* Tannic Acid.

GALLON. This measure of weight is used for beer, milk and other liquids, and for corn. It contains four quarts, and the standard imperial gallon contains 277·274 cubic in. Its weight equals 10 lb. of distilled water.

Stock Sizes of Cisterns. The usual stock sizes of galvanized iron cisterns, rectangular in form and open at the top, intended as receptacles for water are as follows:

Gal.	Length	Width	Depth	Gal.	Length	Width	Depth
	ft. in.	ft. in.	ft. in.		ft. in.	ft. in.	ft. in.
20	1 10	1 4	1 4	175	4 0	2 6	2 10
25	2 0	1 4	1 6	200	4 0	2 9	3 0
30	2 0	1 6	1 8	250	5 0	2 9	3 0
40	2 7	1 6	1 8	300	5 6	3 0	3 0
50	2 7	1 7	2 0	400	6 0	3 6	3 2
60	2 8	1 8	2 2	500	6 6	3 8	3 6
70	2 10	1 10	2 2	600	7 0	4 0	3 6
80	3 0	2 0	2 2	700	7 10	4 1	3 7
100	3 0	2 2	2 6	800	7 10	4 8	3 7
125	3 4	2 3	2 9	900	7 10	5 2	3 7
150	3 7	2 5	2 10	1000	7 10	5 9	3 7

GALL STONE. The hard, stony mass to which the name of gall stone is given consists of bile pigment, lime salts and cholesterin. It may be the size of an egg or no larger than sand, and the numbers vary from one or two large ones to hundreds of smaller ones. Gall stones, which may occur in the gall bladder or in the bile ducts, are much more common in women than in men, and are rare before middle age. Over-eating, lack of exercise, and abuse of alcohol are common predisposing causes. The active cause is germ infection from the intestine or by way of the blood which sets up chronic catarrh in the gall bladder.

Gall stone colic, or biliary colic, is the intense spasmodic pain occurring when a stone, leaving the gall bladder, passes along the bile passages on its way towards the intestine.

Preventive treatment consists in restricting the diet, insisting on sufficient exercise and keeping the bowels regular with salines, such as Epsom or Glauber's salts, etc. Alkaline mineral water or plain water should be drunk freely. Tight clothing should not be worn.

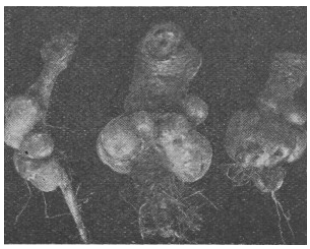
When an attack of gall stone colic occurs the doctor should be urgently summoned. Hot fomentations over the whole liver region sometimes relieve the pain, and should be tried until the doctor arrives. *See* Jaundice.

GALL WEEVIL. Attacks of the little gall weevil are very common to turnips. Damage is in the form of small whitish swellings, from the size of peas to that of marbles. The eggs of the weevil hatch into small, grey, wrinkled maggots, which

feed on the tissues, making a hollow cavity, in which they lie.



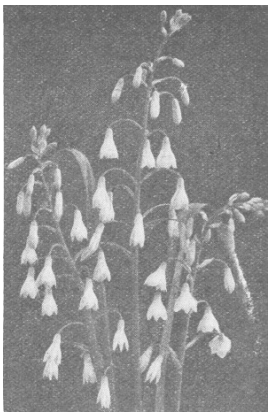
Gall Weevil. Young turnips galled by the pest. Right, the weevil, much enlarged.



The pest is worst on light soil, and may become serious on any land if proper rotations are not adopted. Change of site may not avert it entirely, but will keep it within bounds. Should it threaten to become a chronic nuisance, every old stem of green and every old unused part of the turnip crop should be charred over the garden fire before being dug into the soil.

The piece of ground for next year's crop should be dressed with fresh lime at the rate of two stones per square rod, the substance being left on the surface for a few weeks and then turned into the top spit. As a further precaution, all transplanted greens should be well puddled with wet clay and soot the following year before planting. *See* Cabbage; Club Root; Turnip.

GALOP. This dance consists of gliding steps executed with much rapidity. Slide the left foot into the second position and chassé to the left, making a half turn on the ball of the left foot and drawing the right foot up behind. The movement is then repeated with the right foot. The girl's steps are the same, but she begins with the opposite foot to the man's. This is usually taught with 8 chassé , 4 and 2 danced smoothly.



Galtonia candicans, the hardy Cape Hyacinth, which bears white, bell-shaped flowers in August.

GALTONIA. This is a handsome hardy bulb plant which forms a tuft of large leaves, and in August bears drooping bell-shaped white flowers on a stem about 3 feet high. It is known also as the Cape hyacinth and as Hyacinthus candicans. The bulbs are hardy, thrive in ordinary well tilled and manured soil, and are planted in March, 4 inches deep and 12 inches apart. Sand should be scattered round about the bulbs when planting on heavy land. In cold districts ashes should be placed on the soil above the bulbs in winter.

GALVANIZED IRON. Sheets of ordinary iron are treated by galvanizing to resist corrosion, common forms including the corrugated sheets used for covering roofs. Flat or Italian roof sheets are made of galvanized iron with one of the sides turned up to form a weather-tight joint.

Galvanized iron is handled in a similar way to ordinary black iron, except that for soft soldering the flux should be hydrochloric acid. The soldering iron should not be worked too hot, and the surface of the metal must be thoroughly cleaned with a file or scraper before attempting to solder. It may be welded with the oxy-acetylene blow pipe if the film of zinc on the surface is removed by filing.

Galvanized Wire. As a rule, galvanized wire consists of soft iron wire coated with a protective film of zinc, applied by one of the recognized galvanizing processes. Being soft and pliable it can be used for binding metal parts to woodwork. It is made in many sizes, from fine to a rod of substantial thickness.

Fencing wire is generally made of galvanized iron, and No. 8 is the usual size for a single-strand wire. Stranded galvanized wire is used for clothes-lines and fencing, the common size having seven strands and ranging from Nos. 3 to 6 wire gauge. A cwt. of No. 6 contains about 450 yd., a cwt. of No. 3 about 260 yd., and other sizes in proportion. Galvanized barbed wire is generally made of steel, and sold in reels of ½ cwt. or more. Galvanized wire netting in various gauges and meshes is sold in rolls of 50 yd., from 12 in. to 72 in. wide, and from ½ in. to 4 in. mesh the mesh being the size of the spaces between the wires. *See* Fence; Gauge; Wire; Wire Netting.

GALVANIZING. The object of galvanizing is to preserve from corrosion articles made of iron and steel. It consists in applying a protective coating of zinc to the surface of the metal, and requires the use of special machinery. For hot galvanizing, the article to be treated is immersed in a bath of molten metal at a temperature of about 1000° F.

Electro-galvanizing is carried on in much the same way as the electro-deposition of copper and other metals. Another method is the dry process, sometimes known as sheradizing. The articles have to be properly cleaned and are then placed in a frame or barrel and heated to about 600° F. The barrel contains a quantity of zinc dust, and as the articles move about in it the dust is deposited upon them and forms a protective coating. The sheradized surface is rather brighter and more silvery than that produced by the ordinary hot galvanizing. Should the amateur worker desire to have his products galvanized, this can be done by sending them to a galvanizing firm through the local builders or ironmongers.

GAMBLING: In Law. Contracts by way of gaming or wagering are not enforceable at law. Cheques and other securities given for gaming debts may be stopped or recovered from the person to whom they are given. But if a cheque has been paid the money cannot be recovered; and if a cheque or security comes into the hands of an innocent party the latter can

recover on it. If an agent is employed to make bets and he pays any bets lost for his principal, the latter is not liable to repay him, even though he expressly requested him to pay the winner.

Money lent to pay a betting or gaming debt is not recoverable at law. If A owes B a gaming debt, and B threatens to do something which will bring A into disgrace unless he pays, and A promises that if B will hold his hand for, say, a month he will then pay him, and B agrees to do this, then A must pay at the end of the month. This is because the law regards the forbearance as a fresh consideration. If a betting agent wins for his principal and receives the money from the loser, he is bound to pay the money over to that principal.

It is a criminal offence to send a betting circular to a person under 21. It is also a criminal offence to keep a house or place for the purpose of betting with persons resorting thereto. A house kept as a gambling house is a disorderly house, and both the keeper and the frequenters are liable to penalties. If both parties to a bet deposit the money with a stakeholder, the loser may demand his money back before the stakeholder has actually paid it to the winner.

GAMBOGE. This is a reddish-yellow gum resin that acts as a powerful cathartic, producing copious watery motions It is therefore useful for ridding the body of fluid in dropsy, and may also relieve chronic constipation. It is generally used combined with other drugs in the compound pill of gamboge, but it should not be used except on medical advice.

GAME: Choice and Cooking. In choosing game, select birds with firm, thick breasts, smooth legs, short spurs and quill feathers, and feet that are supple and easily broken. The time required for hanging depends upon the weather, the individual tastes of the person for whom the game is being prepared, and also upon the particular type of game concerned Waterfowl, snipe, and woodcock, for instance, should be cooked while fresh, but most other kinds of game may be hung from between 5 and 10 days, and in some cases for a full fortnight. In damp weather 5 days will probably be found sufficient unless the birds are liked high, while game that is bruised or damaged in any way should be cooked as early as possible.

Hang the birds, unplucked and undrawn and with a piece of string tied tightly round the neck, in a place where there is a constant current of fresh air, and examine them carefully each day. If there are any signs of taint, wash the bird in a strong solution of salt and water to which a little vinegar has been added, and then rinse it in clean, fresh water. When plucking game be careful not to break the skin, and before cooking wipe it inside and out with a cloth wrung out with hot water. Snipe, woodcock, and plover, however, should never be drawn.

Roasting is the most satisfactory way of cooking most young game. To roast, pluck, clean, and truss the birds, tying a slice of fat bacon over the breast of each. Cook them before a clear fire or in a hot oven, the time depending on the kind of bird, keeping them well basted with butter or good dripping. If the bird has been hanging for a long time, it will require to be cooked thoroughly. Ten minutes before the game is cooked remove the slices of bacon, dredge with flour, baste thoroughly and return to the fire or oven to brown well. Place two or three slices of buttered toast under the birds, so that any gravy which drips from them may be absorbed. Then lay the slices of toast on a hot dish, place the birds on them, and garnish the dish with sprigs of watercress. Hot gravy, bread sauce, and fried potatoes and breadcrumbs should be served as an accompaniment.

Game Cutlet. Prepare by melting 1 oz. of butter in a pan over the fire, adding to it ½ oz. flour and ½ teaspoonful chopped shallot, and frying these a light brown. Then pour in 1 gill stock, and stir the sauce until it boils. Add ½ lb. chopped game, free from bone, 2 oz. chopped ham, 1 teaspoonful red-currant jelly, ½ teaspoonful lemon juice, and the beaten yolk of an egg. Stir the mixture, but do not let it boil or the egg will curdle. Season it carefully and turn it on to a plate to cool.

Next shape it into neat cutlets, roll these in breadcrumbs, then brush them over with beaten egg and again coat them with crumbs. Have ready a pan of hot fat, put in the cutlets, one or two at a time, and fry a golden brown.

Game Kromeskie. Mince finely ½ lb. game, 2 oz. ham, and 8 mushrooms. Melt 1 oz. butter in a small pan, and in it fry 2 small chopped onions, browning them as little as possible. Add these to the game, etc., mix all well together, and season to taste, using enough brown sauce to bind it well. Turn the mixture on to a plate to cool, and then cut some fat bacon into thin slices about 3 in. square.

Put some of the cold game mixture on each slice, roll these into cork shapes, and fasten the ends with match-sticks or small skewers. Dip the kromeskies into frying batter, drop them into boiling fat, and fry them a golden brown, finally draining them on soft paper and garnishing them with fried parsley.

Game Pie. A raised game pie is best eaten cold. Instructions for making the pastry are given under the heading Pastry. Chop up finely 1 lb. each of veal and pork, and season them well with salt and pepper and grated nutmeg. Put a layer of this meat all round inside the pastry, and fill in the centre with strips of raw game of any kind. A mixture of different kinds such as grouse, partridge, hare, and pheasant may be used if liked.

The bones should first of all be removed, put into a pan containing cold salted water and a small onion, and left to simmer for about 1 hour. This will provide the stock. In layers with the game put 2 tablespoonfuls of chopped truffles, the same quantity of chopped

mushrooms, and 2 teaspoonfuls of chopped parsley. Cover these layers with some more of the veal and pork mixture, brush the edges of the pastry with a little cold water, and roll out the remainder of the pastry to form a lid. Make a hole in the centre.

Brush this lid over with a little beaten egg, and tie a greased band of paper round the mould to reach 3 or 4 in. above the top. Bake the pie in a moderate oven for 3½-4 hours, then take it out of the mould, and leave it to get nearly cold. Melt a little aspic jelly, add it to ¾ pint of the stock, and strain these into the pie and leave it to grow cold.

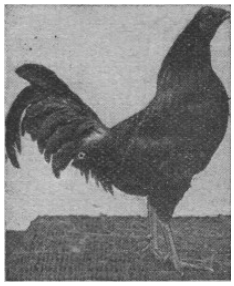
Game Pudding. Cooked in the following way, old game can be made quite tender: Cut a brace of birds into small joints, and chop up the hearts and livers. Skin 1 lb. of sausages, roll the meat into balls, each about the size of a large marble, and stalk and peel ½ lb. of mushrooms. Make some suet pastry, using ¾ lb. of flour, 6 oz. of chopped suet, a teaspoonful of baking-powder, a small teaspoonful of salt, and water to mix. Cut off a third of the pastry for the lid, roll out the remainder, and with it line a well-greased pudding-basin. Fill this with pieces of bird, sausage balls, and mushrooms, then pour in enough seasoned stock to reach three-quarters of the way up the basin. Wet the edges of the pastry, cover the pudding with the remaining piece rolled out to fit the top, and then press the edges together. Tie a clean pudding-cloth over the top, put the basin into a saucepan of boiling water, and boil its contents for at least 2½ hours.

Game Salmi. For a game salmi, first of all roast the birds, and then cut them into joints about the size of the wing of a partridge. Lay the joints on one side while the sauce is being prepared. The drumsticks should be cut off quite close to the flesh of the leg, and put with the trimmings, broken small, into a stewpan, with a slice of fat bacon, an onion, or 3 shallots, prepared and chopped fine, 1 oz. of butter, and a bay leaf tied up with a sprig of parsley.

Fry this briskly for 5 min., then pour over it 1 pint of good flavoured brown stock and a glass of sherry; 3-or 4 mushrooms, prepared and cut fine, are an improvement. Season and boil the stock until the liquor is reduced by one-half, then stir in ½ pint of brown sauce. Let it simmer for ½ hour, skimming off the fat as it rises, then strain it and add a piece of butter the size of a large nut, and a teaspoonful of lemon juice.

Heat the game thoroughly in the sauce without allowing it to boil. Arrange the pieces on a dish in the form of a pyramid, and pour the salmi sauce over and round it. Garnish with croûtons of fried bread and button mushrooms cooked in butter. *See* Bread Sauce; Grouse; Gun; Hare; Partridge; Pheasant; Wild Duck; Woodcock, etc.

GAME FOWL. Originally renowned for its righting prowess and now for its unique table qualities, this is one of the most popular of our domestic fowls. It lays a fair-sized white-shelled egg unexcelled for richness of flavour, while for fullness of breast and fineness of bone it is unequalled by any other breed. Game fowls are divided into two classes, namely, old English and modern, and in addition there are many varieties of each. *See* Fowl; Poultry.



Game Fowl. Cockerel of one of the most popular domestic breeds. (Courtesy of "The Poultry World.")

GAMGEE TISSUE. This consists of a layer of absorbent cotton wool between layers of gauze. It forms a tidy outer dressing for wounds, and is very suitable for applying a protective jacket to the chest in cases of bronchitis, pneumonia, etc. The jacket is cut into shape for effective application. *See* Dressing.

Gammon. Cut of bacon taken from the thighs of the pig. *See* Bacon.

GANGLION. A Greek word denoting a tumour under the skin, the term ganglion is used to describe two entirely different things— a swelling attached to tendons and a small collection of nerve cells; the former is an abnormal condition, the latter a normal structural part of the nervous system.

The former is a small swelling, often about the size of a hazel-nut, attached to the tendons on the back of the wrist and occasionally to those of the instep. It consists of a jelly-like substance, and is in fact gelatinous connective tissue which forms beneath the sheath of a tendon, probably as a result of long-continued irritation or strain. Such ganglia are frequently connected with the joints beneath the tendons and are nearly always larger and more extensive than they appear to be from external examination.

They can be safely left alone, but if they cause pain or inconvenience they can be removed by a small operation.

A more serious form is known as a compound ganglion. This is a tuberculous infection of the sheaths of the tendons and most frequently occurs about the tendons on the front of the wrist. A considerable collection of fluid results, which distends the sheaths, and is manifested by swelling above the wrist and in the palm. The most speedy and effective treatment is operative.

GANGRENE. The Anglicized form of a Greek word denoting a rodent sore, the term gangrene is applied to a local death of tissue, usually of an extremity, but liable to occur in any organ or part of the body. The changes that are operative in the production of the condition are those that cause

obstruction to the local blood supply. The main artery supplying the part may be torn across, or it may be blocked by an embolus, compressed by an inflammatory mass or tumour, or it may be the seat of slow obliterative changes in its own wall. Burns and frost bite are other causes of gangrene.

Two varieties are recognized, dry and moist, the latter being by far the more dangerous; the parts are cold, swollen, discoloured, and afford an ideal breeding ground for poisonous organisms. Most gangrene is associated, therefore, with very profound symptoms of poisoning and a serious danger to life.

Two chronic diseases are especially prone to lead to gangrene of the extremities—diabetes and arterial degeneration of old age. Gas gangrene is a special form of rapidly spreading gangrene common in warfare. It affects even trivial wounds and causes heavy mortality.

Moist dressings such as fomentations are dangerous and should never be used; their place is to be taken by dry heat and dry antiseptic powders; the limb should be raised on a pillow so as to allow as free an exit as possible for the blood and lymph from the affected area, while by gentle massage the circulation in the more healthy vessels of the limb is encouraged.

GAPES. A disease peculiar to young chickens, gapes arises from the presence of gape worms in the windpipe. These cause the chickens to open their mouths as if gaping, and if not removed in time will result in death by suffocation. The worms can generally be dislodged by dipping a long, soft feather in turpentine, gently inserting it into the windpipe, and twisting it round, and then withdrawing it, when the worms will be coughed up by the chicken.

Thorough disinfection of soil, coops, and runs must be resorted to whenever an outbreak of gapes occurs. The plan usually adopted for cleaning the land is to lime it thoroughly and let it lie fallow for two years at least. (Ministry of Agriculture Bulletin, No. 6.) *See* Chicken; Poultry.

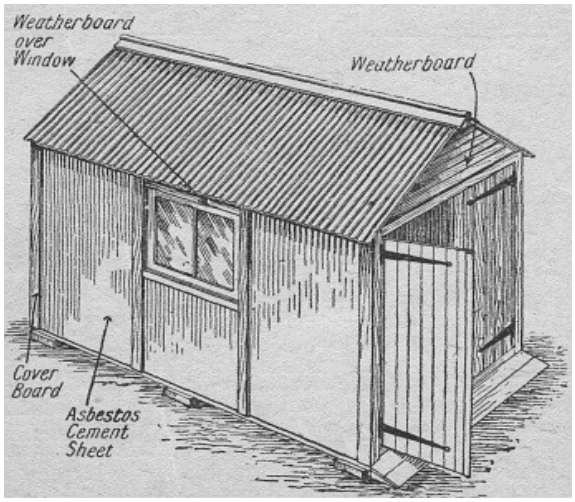
GAPING. Due to a lack of oxygen in the blood, gaping may result from fatigue or from, sitting in a stuffy room. Gaping is a common symptom in persons who suffer from chronic lung trouble.

GARAGES AND THEIR CONSTRUCTION

Housing Large Cars, Small Cars and Motor Cycles

By following the instructions given below the motorist who is handy with a carpenter's tools can easily erect a garage to suit his requirements. Consult the articles Amateur Carpentry; Asbestos; Cement; Door; Weatherboard, etc. See also Bicycle Shed.

A garage is a necessity to very many householders, for the requirements of modern life demand the use of a motor vehicle, and even if this be nothing more than a motor-cycle or a side-car combination, it is desirable to house it in a sound, dry building.



Garage. Fig. 1. Garage for motor cycle and side-car. Constructional drawings are given on page 862A.

Suitable materials of construction are numerous. In brick districts the use of the cheapest grade of brick might prove most economical; where gravel abounds, the walls could be put up in concrete at small cost. There is a wide choice of timber structures and suitable asbestos and other building boards.

The motor-cycle and side-car garage shown in Fig. 1 is made on a timber framework covered with asbestos sheets and roofed with galvanized iron. It is highly desirable to fix the dimensions of the building so that the sheets can be used in their stock sizes. Cutting them is a tedious business, and there is the risk of breaking the sheets; the sizes available can be ascertained from the makers or from the builder's merchants.

The first thing to do is to prepare a plan of the site and of the building, and to mark the leading dimensions, something in the manner of Figs. 1 to 7. The side (Fig. 2) and end frames (Figs. 3 and 4) are then made up from 2 in. square deal, halved at the corners, and well nailed together at these and all joints. Cross braces are essential to provide the requisite stiffness, as the asbestos sheets look to the frame for their support, and do not support the frame to any great extent, as is the case when timber is used.

The floor (Fig. 6) is prepared by nailing 1 in. tongued and grooved boards to 3 in.by 2 in. joists, the underside being treated with creosote or some other preservative. The site is cleared of top soil, and nine little piers of brick or stone placed as shown in Fig. 6 so that they will support the sleeper plates, which are of 4 in. by 2 in. deal. The sleeper plates should be creosoted, and held in place by pegs driven into the ground to keep them from shifting while the floor is placed in position upon them. The floor could be laid in cement concrete, but in this case the expense is considerably greater.

Having placed the floor in position, the walls are erected by setting up one side frame, and supporting it temporarily with a cross batten. The end frame is set up and the corners bolted together. The walls must be plumbed up true with a plumb bob, and the angle set square, testing this with a large straight edge and a

large set square, or by the 3.4.5 angle system. This is done by measuring a distance of 3 ft. along the end wall from the corner, and measuring along the side wall a distance of 4 ft. Mark these places by driving nails into the frames at the exact spots, and when the distance across the angle between them is 5 ft. the corner of the building is square. Adjust the wall frames until the corner is square and then fix them to the floor with two bolts in each section, putting them through the joists. The other side and end frames are then erected, and all corners bolted up tightly.

The ridge board is fixed in position, and the walls covered by nailing the asbestos sheets to the framing, the uprights for the latter having been spaced so that the joints between the sheets come on one of the frames. The bottom of the sheets should come just below the bottom of the floor to protect it from the weather and to allow the water that runs down the walls to drip away and not accumulate under the building. This is one of the reasons for the sleeper plates, as they raise the floor above ground level. The top surfaces of the sleeper plates are improved by nailing a strip of stout roofing felt, or preferably a bitu-minous damp-course, to prevent the damp rising from the ground. Free circulation of air under the floor is essential.

The roof is a simple matter when corrugated iron is used, as the sheets have only to be nailed to the ridge and to the plates or to the top of the wall frames. If preferred, it can be made with boards and covered with a good quality roofing felt or imitation roofing tiles. The interior is all the better for a lining of thin matchboard or 3-ply wood, but this is not absolutely essential. The gable ends are covered with weatherboard, as this is easier to fit than cutting the asbestos sheets. All corners and the joints between the sheets are covered with vertical strips of wood about 4 in. wide and ½ in. thick, as shown in Fig 7. The doors (Fig. 5) are made of matchboard, ledged with 4 by 1 in. deal, and braced with the same material, provided with a bolt and a stout padlock and hasp.

The whole of the exterior woodwork is creosoted, and the roof coloured with a dark red paint; this had better be done after the building has been erected, as the sheets will have mellowed and will take the paint better. The interior can be lined with matchboard or 3-ply wood; but if this is not done, a skirting board and a striking board should be nailed to the walls to take the thrust of the wheels when the machine is pushed in. An exterior ramp or sloping approach must be made and fixed in place to enable the machine to be pushed in without trouble; these boards should have an easy slope, and be supported on wedge-shaped blocks.

Weatherboarded Garage. For housing the average car a garage of the size given in Figs. 8 to 12 is ample. It measures about 14 ft. 6 in. long by about 7 ft. 6 in. inside, and has a head clearance of 6 ft. 4 in. Before starting to build, however, it is a wise precaution not only to measure up the car, but to consider whether a larger car is likely to be purchased.

The building consists virtually of four frameworks forming the walls, and a roofing. The frames are made up from 3 in. by 2 in, stuff and are covered with weatherboard. Each side is made up as a complete unit in itself, and all four are fixed together with bolts afterwards. This makes the whole collapsible, a great convenience if it is desired to move at any time, and simplifies the erection.

Figs. 9, 10 and 11 give the sides, back and door ends respectively. Cut off the various parts to length, taking care to make each set of parts the same length. A simple form of joint to use is the halved joint: all parts can then be cut off to the overall size and the joint marked out with a gauge. When nailing the frames together test carefully for squareness. A good method of doing this is to place a lath of wood diagonally across the whole and mark the length. When put into the opposite corners it should show the same length. The diagonal struts shown in Fig 9 are added afterwards.

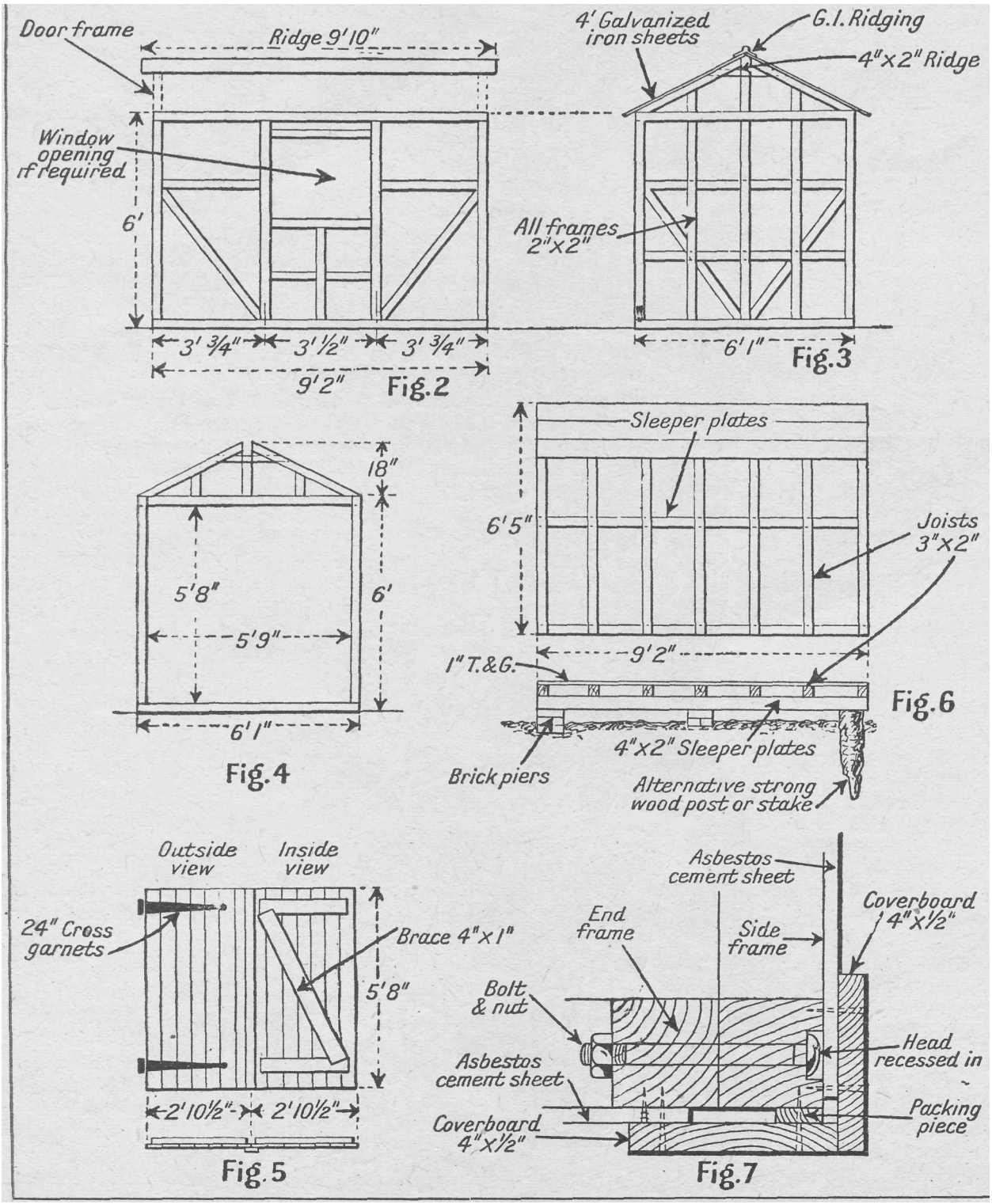
The two ends are made in the same way except that the sloping top part is added after the main square part has been put together. Here again the joints are halved, except at the ends of the top sloping members, which are simply bevelled at the underside and nailed down.

Erecting the Garage. The type of flooring the garage is to have must first be determined. Concrete is much used nowadays, and has the advantage of forming a foundation for the whole. If this is used channels must be formed in it to allow the bottom members of the walls to sink in so that there is no projection beneath the door. A ramp can be formed outside, as shown in Fig. 8.

Assistance is necessary when fixing the walls together. They are held by handscrews, and bolt holes are bored through the joining uprights. Pass the bolts in from the outside, and put washers beneath the nuts. It will be noticed from Fig. 9 that an extra sloping roof piece is fixed at the centre. When this has been added a series of long pieces known as purlins are nailed down on to the sloping pieces, as shown in Fig. 12. These are to take the roof boards. The last named should preferably be tongued and grooved. Note that the top ends must be cut off at an angle so that there is a good ridge joint. It is a good plan to cut off one board to length, and then cut all the others to it.

The roofing felt is laid on in long strips running from side to side without a join at the top. At the joints an overlap of about 2 in. should be allowed. To make these waterproof use the special cement supplied by the makers. Clout nails are used to fix the felt, and battens of 2 in. by ½ in. stuff are nailed down over the joints. When cutting the felt to length an extra allowance of about 2 in. should be made so that it can be turned up underneath at the edges.

Fig. 13 shows how the weather boarding should be fixed. It is added from the bottom upwards, and the nails are driven through the overlap, as shown. Note that the boarding at the sides reaches only to the ends of the side frames. A batten fixed to the edges of the front and back frames has the effect of hiding the ends



Garage: How to construct the garage for a motor cycle and side-car shown in the previous page. Fig. 2. Side frame. Fig. 3. Rear end frame. Fig. 4. Front end frame. Fig. 5. Doors, shown from both outside and inside. Fig. 6. Plan of floor. Fig. 7. Details of corner, showing coverboards.

of the boarding. The decorative battens above the doors are nailed direct over the boarding.

An ordinary casement window framing is made for one side. The framing is screwed or nailed to the sides, and the casements hinged to them. For the doors use tongued and grooved boards secured by a series of cross pieces. Diagonal braces should be added to prevent the whole from sagging. All timber should be creosoted to make it durable. For a good job rebated or matched weatherboard could be used, which would present a flush inside surface.

Garage in Asbestos Board. A somewhat lighter garage suitable for the "baby" type of car is given in Fig. 14. The main framework is similar to that in Fig. 8, but the walls are covered with asbestos board instead of weatherboarding. Apart from the size of the car it is to shelter, and the space available for it, one should consider the sizes of asbestos board available before starting on the framework. Otherwise, there may be a good deal of unnecessary waste and labour. The boards are in long panels fixed upright, and the framework has to be so made that the framework uprights coincide with the vertical joints in the boards.

A side framework is given in Fig. 15. This allows for panels 2 ft. wide. If the long sides are made to suit the asbestos boards, the two ends (Figs. 16 and 17) can be made any convenient size, for in any case there is a fair amount of trimming to be done here. A fixed window is provided at the back. The framework for this is made up complete in itself and is fixed in the space for it after the whole job has been erected.

Having completed the four frames for the sides and ends (the joints are halved as before), they are erected in position and bolted together. Either a concrete foundation can be made, or stout wooden sleepers can be laid down. Alternatively, bricks can be set out and the garage mounted upon these. If concrete is not used for the flooring, a framework with boards laid across it must be made up. In size this should just fit inside the walls, and is laid in position before the walls are erected.

Large clout nails are used to fix the asbestos board. Fix the whole in position, trimming them where necessary with an old handsaw. A series of battens of 2 in. by ½ in. stuff can be fixed over all the joints (Fig. 18). These give a decorative touch. It is advisable to stain them before fixing. The roof can be made similarly to that in Fig. 8.

Ledged and braced doors made up with tongued and grooved boards are hinged with strap hinges at the open end. A covering strip is nailed down over the right hand door. The ramp can be a series of stout boards nailed down on to three tapering cross pieces.

Numerous by-laws of local authorities control the building of garages, and in particular the materials of which they may be constructed and their distance from the public street or other building. Building a garage usually increases the rateable value of the premises.

Hiring a Garage. Some motor car owners, such as those who live in flats, possess neither a garage nor the ground on which to erect one. To these owners two courses are open. They can either hire a garage or can keep the car at a public one.

In large cities many lock-up garages have been erected, with rents usually in the neighbourhood of 10s. a week. They are often built in connexion with a public garage, or petrol filling station.

In public garages the charge is so much per week or per month, but this method will be found more expensive than building or hiring a lock-up one. It has, however, some advantages, one being that the requirements for repairs of all kinds are on the spot. Moreover, since it is connected by telephone with the owner's house, the delay in summoning the car will be slight.

Safety Precautions. The regulations known as "Statutory Rules and Orders, 1929," relating to the storage and use of petroleum spirit affect the garage owner. Every private garage or other building in which petrol is stored, whether it is contained in the usual two-gallon cans or in the tank of the car or motor cycle, must meet with certain requirements.

It must be effectively ventilated; it must have an entrance direct from the open air; it must be separated from adjacent buildings or from other rooms in the same building by fireproof floors or partitions: and suitable fire extinguishing apparatus must be kept in the storage place or as near to it as is reasonably practicable. The extinguisher carried on the car is no longer considered to suffice for this. As an alternative to a fire extinguisher, a supply of sand or other effective means such as loose fine earth may be kept in a pail ready for use, but sand and earth are much less effective than a chemical fire extinguisher. Water should not be used on any account, since both oil and petrol float on top of the water, which will therefore merely assist in spreading the flames.

If any petroleum spirit is kept in the garage, other than that in the tank of the car, it should always be contained in the proper screw-stoppered cans, and must not be left in an open vessel. The greatest care must always be taken to avoid any fire or naked light being so near any vessel in which the petrol is kept as to be dangerous. It should be remembered that even a particle of red ash dropped from a cigarette may cause a fire when filling the car tank. The fumes from the exhaust of a motor vehicle may contain the highly poisonous gas known as carbon monoxide, produced by imperfect combustion of petrol in the engines.

If the engine is allowed to run while the car is standing in the garage, the exhaust should be connected to the outer air so that the dangerous fumes do not escape into the building. A further precaution is to open doors or windows in order to ventilate the garage thoroughly.

GARDENS AND HOW THEY ARE PLANNED

How to Lay Out a Town or Suburban Plot

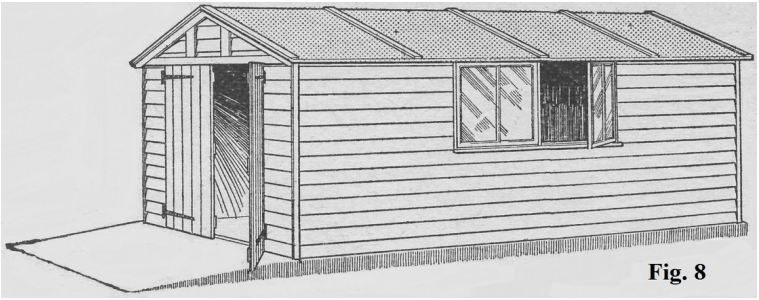


Fig. 8

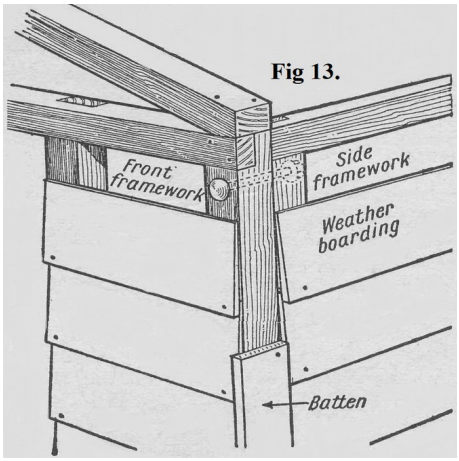
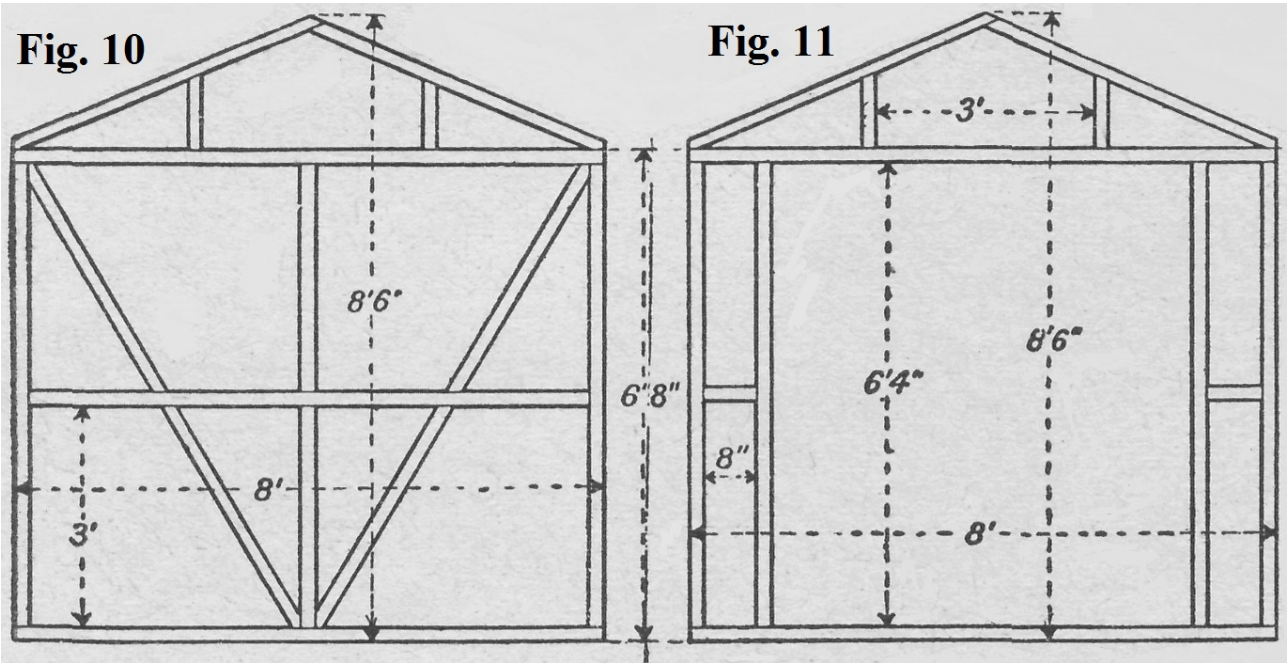
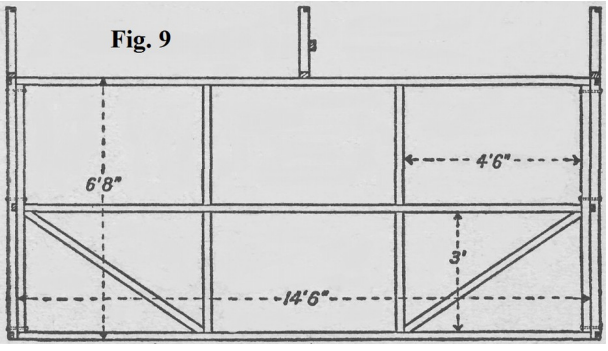


Fig 13.





Garage. Fig. 8. Weatherboarded garage for an average-sized motor car. Fig. 9. Side frame. Fig. 10. Rear end frame. Fig. 11. Front end, with frame for door. Fig. 12. Framework for the roof, showing the purlins for taking the roof boards. Fig. 13. Diagram showing how the frames are bolted and the weather-boarding is fixed.

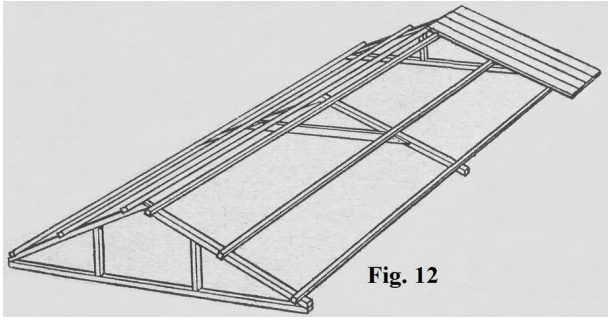


Fig. 12

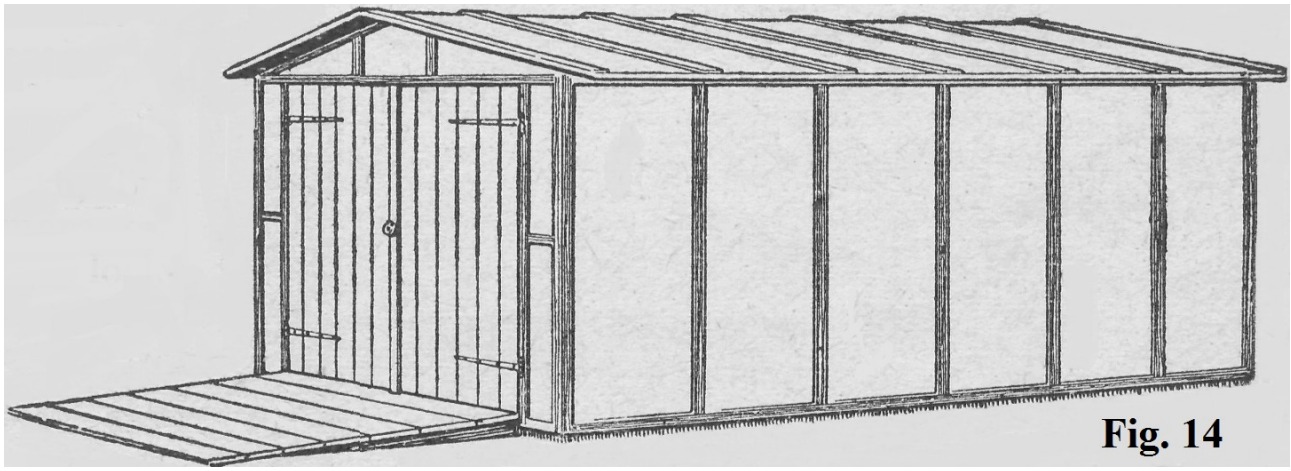


Fig. 14

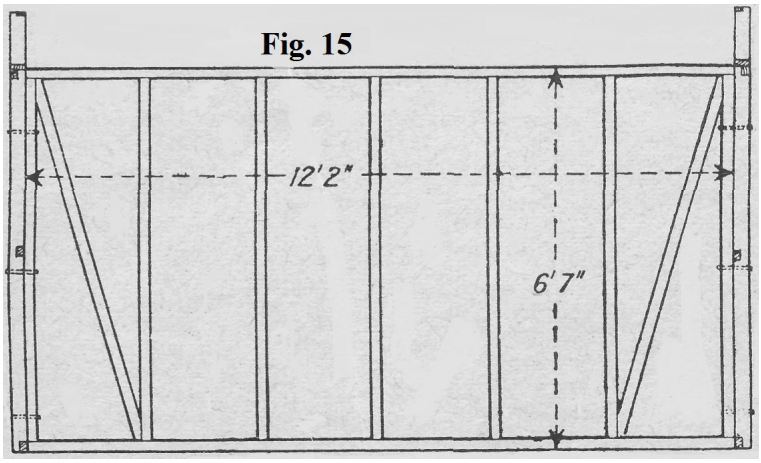


Fig. 15

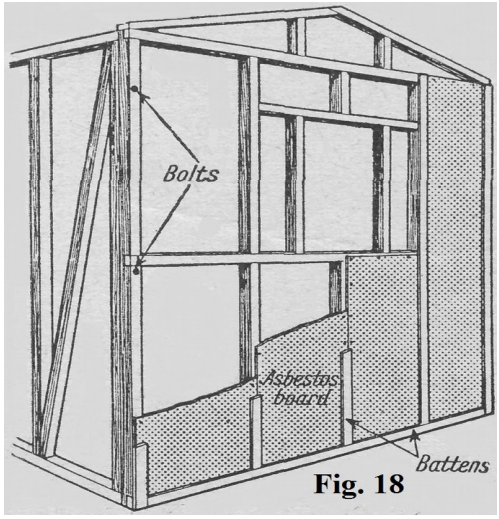


Fig. 18

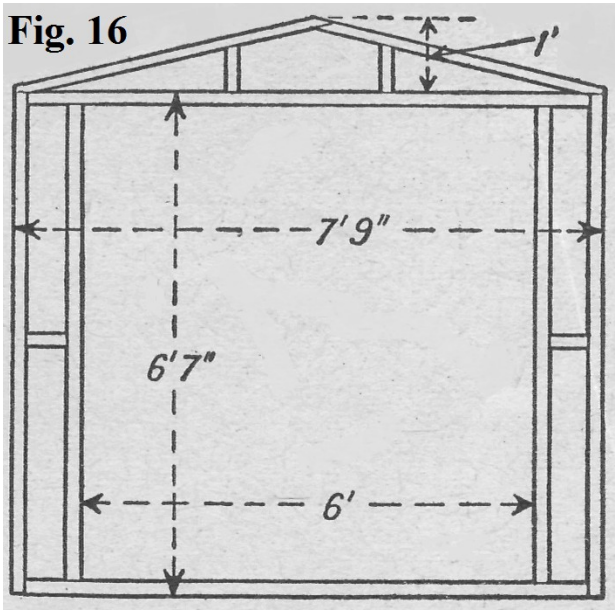


Fig. 16

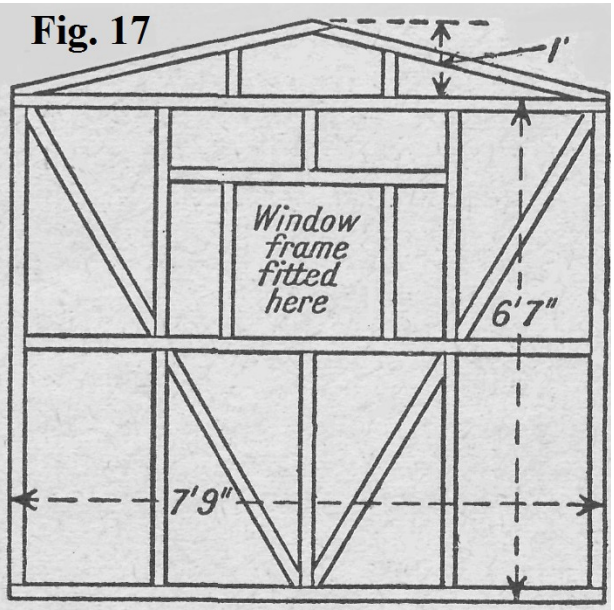


Fig. 17

Fig. 14. Garage for small car, covered with asbestos board. Fig. 15. Side frame. Fig. 16. Framework of door end. Fig. 17. Framework of rear end. Fig. 18. Method of fixing asbestos boards and the battens covering joints.

Here are given three ways of arranging a small garden, together with a plan for a large one. Further information appears under the headings Dutch Garden; Flower Garden and Kitchen Garden. Consult also the succeeding articles Gardener; Garden Furniture; and Gardening; those on Crazy Paving; Digging; Fence; Fixtures; Greenhouse; etc., and, in addition, entries under the names of individual flowers and vegetables.

Planning a garden must be done with method, otherwise mistakes will happen which may entail much labour. To lay down hard and fast rules is not practicable, since one garden may differ entirely from another.

This article does not cater for those who are fortunate enough to possess a large position amid ideal surroundings, but for those whose pleasance is limited to the rectangular plot in town and suburb. The maker of such a garden is usually confronted with a rectangle of ground enclosed by bare wooden fences. With a sheet of paper sectionally ruled, some wooden pegs and string, and ordinary intelligence, the novice may achieve success with his garden.

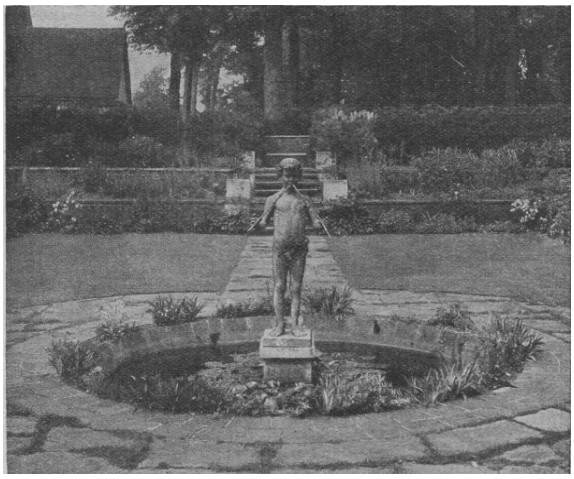


Walled formal garden, with paved paths and square beds filled with tall tulips, a different colour in each bed.

For the purposes of illustration a plot of old meadow land is assumed to be the site available, and its measurements are 68 x 30 ft., a good average size. The requirements are space for flowers, roses, vegetables, a lawn, and, if possible, a little fruit, grown within the limitations defined. With this purpose in view three plots are dealt with, each precisely the same size, but differing in aspect, the respective plots facing approximately north, south, and east.

Fig 1 deals with a plot of the measurements mentioned; it has a northerly aspect when faced from the back of the house, shown by the darkly shaded portion at the bottom of the plan. The first operation may be to locate and erect the trellis about 41 ft. from the house, dividing the flower garden space from that to be devoted to vegetables and fruit; this is shown by the irregular shaded line running between the arch (B) and the small summer-house (C).

It is then advisable to take string and pegs and mark out the borders A, B, and C, their respective length and width being 36 x 5 ft., 31 x 4 ft., and 18 x 2 ft., afterwards pegging out the narrow edging for ferns and iris against the house. Next mark out a rectangle for lawn and rose-beds measuring 32 x 18 ft., which will leave three footpaths well defined as shown in the plan. The rose-beds A and B measure 21 x 4 ft. and 15 x 4 ft. The skeleton of the flower garden being thus effected, the work may proceed by following the advice on digging, path making, and lawns, given under their respective headings.



Sunken garden, with grass and crazy paving, that centres round a little lily pond.

The space for vegetables is necessarily small, but most amateur gardeners like to raise a few fresh vegetables for the household in addition to cultivating flowers, and therefore it will give added interest, as well as some profit, to the general scheme. The diagram is almost self-explanatory, the fences being fronted with a bed of rhubarb, a 12 x 6 ft cool greenhouse A, the space allowed being devoted to a storing shed if preferred, a frame 6 x 4 ft, a row of sweet peas 18 x 4 ft., ample room for loganberries, and a bush apple B. A path 3 ft. wide divides these from the centre plot, and leads directly from the main path of the flower garden to the greenhouse.

It is suggested that cordon fruit trees C, and a second bush apple D, be planted as shown in the sketch, leaving the remainder of the space for vegetables. Quite a useful crop of such vegetables as carrots, turnips, salads, etc., can be grown here, but, if preferred, raspberries, currants, and gooseberries may be planted instead. Potatoes would be profitable during the first season, as these break up new ground admirably. Whatever is chosen should be planted or sown diagonally.

In Fig. 2 the plot is identical in size with that in Fig. 1, but the house faces due south instead of north. This difference in aspect naturally requires a different layout, and the suggested remodelling is shown in the diagram.

The main border A is now placed on the eastern side, not the side with the eastern aspect, which is a very different thing, continuing squarely to the arch B, which leads to the vegetable garden. The path also is transferred to the same side of the plot, the house end enclosing a bed about 16 x 6 ft., which may well be devoted to dwarf roses, with perhaps a weeping

standard in the position shown. Standard roses on the lawn to run parallel with the path would be a pleasing arrangement. The dimensions of the lawn are 26 x 18 ft., and flowering trees or shrubs may be planted with excellent effect at C C.

The greenhouse proposed in Fig. 1 is transposed against the dwelling house, and it is suggested that instead a conservatory would be an agreeable adjunct to the drawing room. In the portion reserved for vegetables and small fruits, dimensions 27 x 17 ft., a shed is conveniently placed at D. while the frame is placed in a more suitable position at E. The trellis screen is now 43 ft. from the house, whilst the sizes of the various beds and borders are: A, 38 x 5 ft.; F, 38 x 4 ft.; G, 14 x 3 ft.; and H, 16 x 3 ft. Bush fruits of various kinds may be planted at J J.

In Fig. 3 an aspect facing due east adds to planning difficulties by reason of the southern side of the garden facing direct north. The diagram, however, makes suggestions which may overcome the drawbacks of aspect. Naturally beds should be confined to the north side, suitable climbers being planted to cover the southern fence as defined in the sketch. The trellis screen and arches A A A are 40 ft. from the house, the length of the main border B being 36 ft.

The bed C is 43 ft. from point to point, and is about double width at the house end. Bed D may be 14 x 3 ft., and border E 19 x 3 ft. Shrubs may be planted at F F, and standard roses at G G G. The vegetable plot is 30 x 24 ft., and positions are given to a greenhouse or shed at H, and frame J. There is also room for a flowering tree, a loganberry against the bottom fence, and a morello cherry against the fence facing due north. Borders which have a north aspect are often a source of trouble and disappointment in small gardens, but the natural shortcomings of such a position may in great part be overcome by judicious attention to suitable plants. Roses recommended are Dundee rambler, Bennett's seedling, Gloire de Dijon, René Andre, and Felicite-et-Perpetue.

A number of hardy plants that will grow successfully in such a position include columbines, various campanulas, lily of the valley, day lilies, irises, Michaelmas daisies, herbaceous phlox, montbretias, golden rod, spiraeas, Solomon's seal and meadow rue, with edging plants of polyanthus, London pride and mossy saxifrages. The soil in a north border should always be well dug, and tendency to sourness dissipated by the free use of lime. Amongst shrubs the flowering currant and laurustinus will be found useful.

In Fig. 4 the lay-out of a more extensive plot is dealt with, its measurements being about 154 ft. by 1.19 ft. This design gives the foundation of a charming garden, which is adaptable to any aspect, and sufficiently elastic to allow for alteration according to individual fancy.

Garden Law. Every man is under an obligation to use his property so as not to injure that of his neighbour, and this legal maxim applies as much to the garden as to the house. Most people who have a garden devote more or less attention to its cultivation, although they are not actually bound to do so unless there is a clause to that effect in their agreement in the case of tenants. But they render themselves liable to be sued for damages if negligence on their part results in injury to adjoining property. Thus if a drain is not kept in proper repair, and it overflows and works havoc in a well-cultivated garden adjoining, the neighbour will be entitled to compensation.

On the other hand, if the owner of the drain can prove that the flooding was caused by a violent downpour of rain and not through any negligence on his part, then he can escape liability. The same principle holds good where a tree is blown down by a storm and damages the flower-beds or the greenhouse in the next garden. But if the tree was old and in an insecure condition, so that it was likely to be blown down, and no attempt had been made to support it, the owner of the greenhouse has a good cause of action.

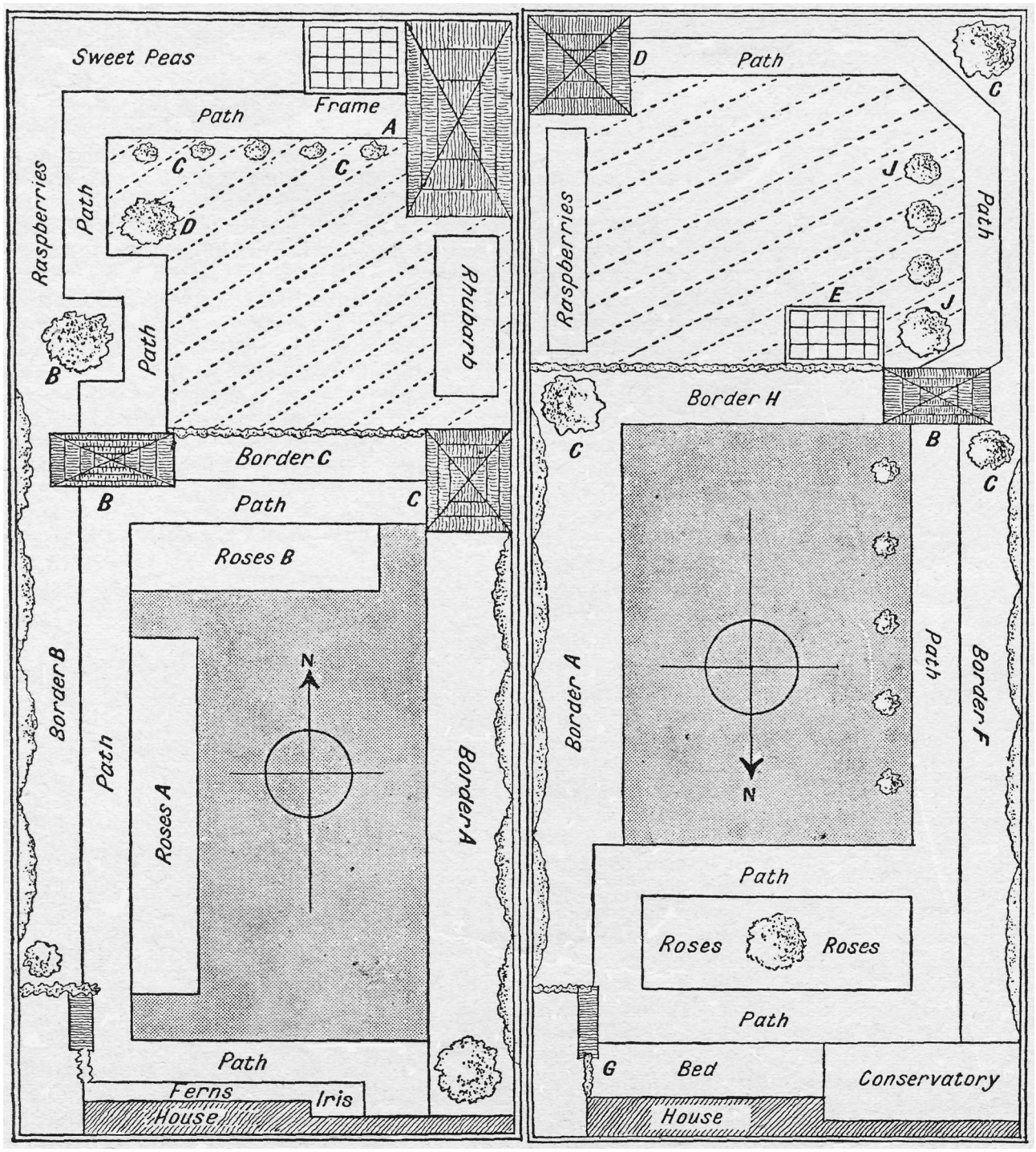
Whether or not a tenant is responsible for the upkeep of a fence will usually depend on his tenancy agreement. Even if he is bound to his landlord to keep up a fence, this does not mean that his neighbours can compel him to keep it up. So far as they are concerned a man is generally under no duty to fence his ground. Nor is he bound to put up or maintain a fence between his own ground and the highway. If he has no fence, however, he must see that there is nothing dangerous—e.g. a pit—on his ground near the highway which might injure persons who inadvertently came on to his ground from the highway. In general, householders find it prudent to enclose, in part or in whole, their gardens.

Innumerable legal decisions have been given on the subject of fixtures, and some of these apply to the garden. The old rule is, in effect, that what is once affixed to the soil must not be removed. For example, a tenant who has improved the appearance of his garden by planting an ornamental border of box is not allowed to remove it unless by special agreement with the landlord, and the same rule holds good in regard to trees that have taken root and become established.

But there are exceptions to the old rule of law. Thus, where the tenant is a gardener by occupation, he may take away any trees and shrubs which he planted for business purposes, and even greenhouses or other structures. As a rule, much depends on the terms of the agreement made with the landlord, and it is always advisable at the outset not to forget the garden when settling what fixtures may be removed at the expiration of the tenancy.

A good example of a popular error occurs in regard to fruit trees, for it is often presumed that a tenant is entitled to any fruit which falls into his garden from his neighbour's trees. This, however, is not the law on the subject. In such a case the fruit still belongs to the owner of the trees, who may exercise his right of recaption by recovering it from the adjoining garden if he chooses. The same rule applies to branches lopped from trees which fall into a neighbour's garden. Where

(Continued in page 932)



Garden. Figs. 1 and 2. Two methods of laying out a garden plot, the difference in arrangement being due to difference in aspect. In Fig. 1 the aspect is north, while in Fig. 2 it is south.

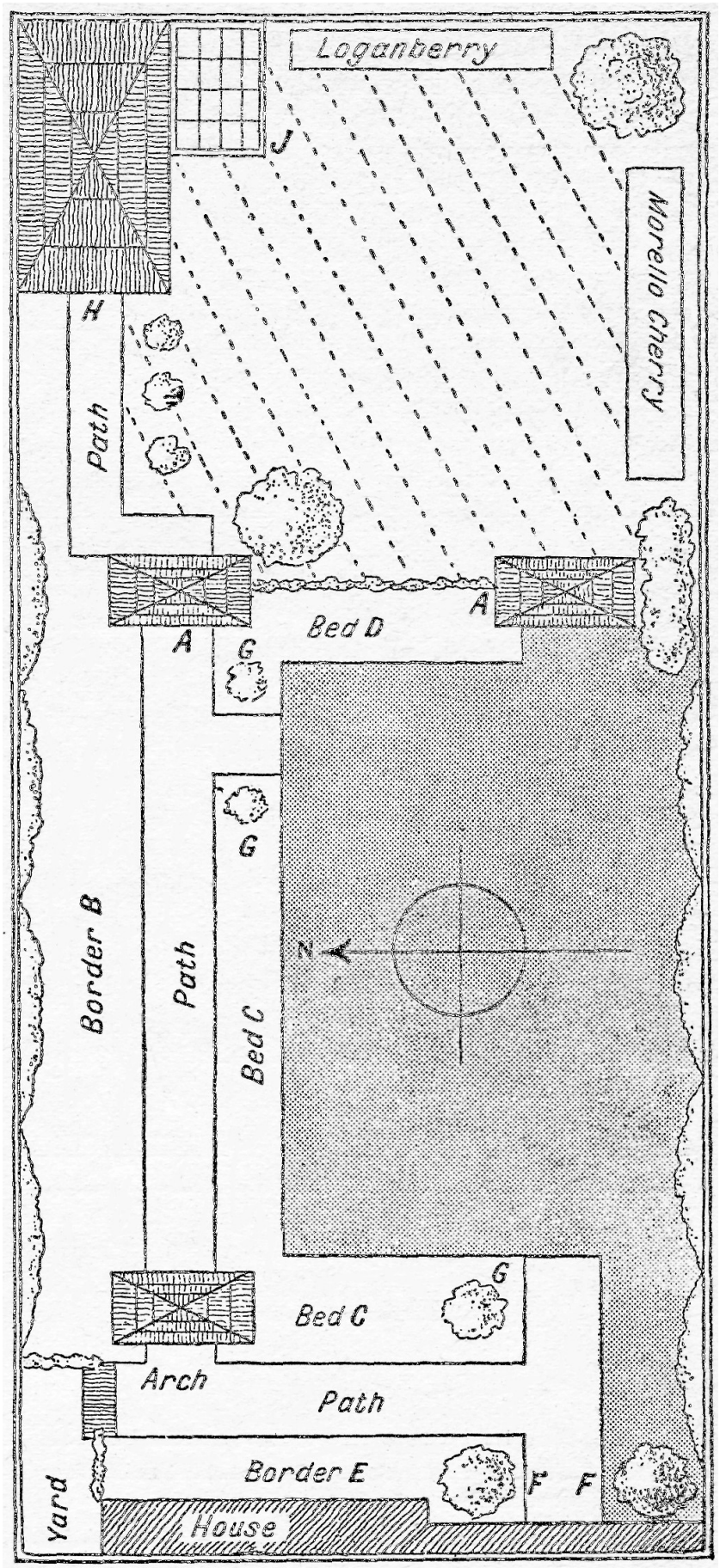
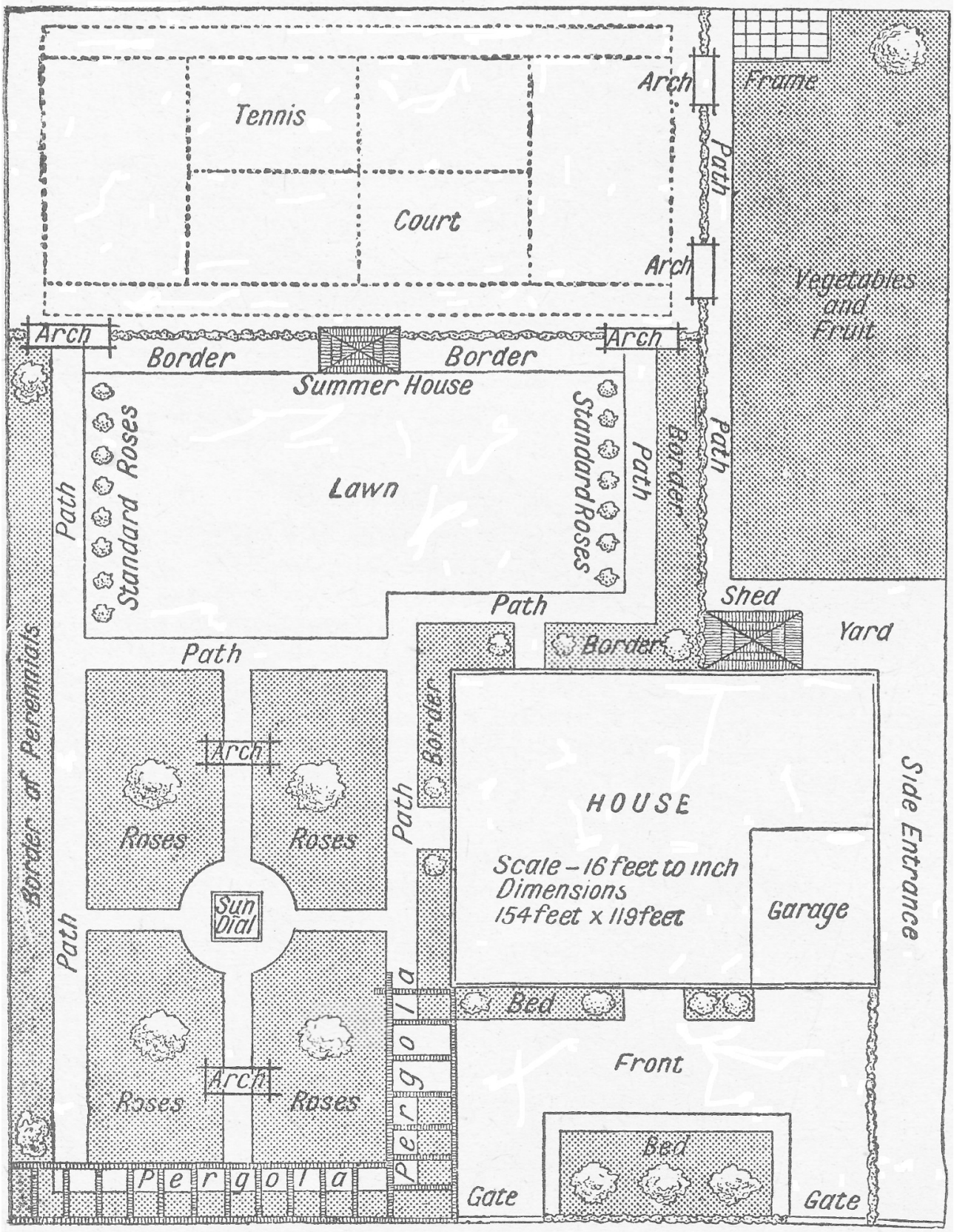


Fig. 3. Another method of laying out the same plot. In this case the garden looks east.



Garden. Fig. 4. Plan of an extensive plot which can be transformed into a charming garden, with tennis court, crazy paths, pergolas and borders.



GARDEN: EFFECTIVE LAY-OUT FOR A MODERATE-SIZED PLOT.

This plan makes the garden look larger than it actually is by a judicious dividing up with trellis and pergola. The vegetable garden is on the left, and in the extreme foreground is the tennis court. A well-covered pergola acts as a screen from the road. The wide borders provide plenty of space for herbaceous flowering plants suitable for cutting, an important factor in most middle-class homes, and the long pergola is admirable for roses, either ramblers or climbers.



GARDEN:TWO SUGGESTIONS FOR SMALLER PLOTS.

Here we see how the maximum effect may be produced from the minimum space. On the left, a narrow garden with a southerly aspect. Well-stocked borders and a wide arch provide plenty of space for flowers, and there is a small but adequate vegetable garden. Right, a similar garden with a northerly aspect. Here the vegetable garden is fenced off by trellis. Vegetables and fruit bushes are planted diagonally to get as much sun as possible.

branches overhang the next garden, the tenant of the latter is entitled to remove them if he has cause to believe that they interfere in any way with the growth of his plants, but the branches which he has cut off belong to his neighbour, and he must not destroy them without his permission.

Cutting hedges requires to be done with reasonable care, because where a party hedge is badly injured or dies through careless cutting the responsible person may be called upon to make good its value to the owner. Digging which affects the foundations of a party wall involves similar liability. *(See* Hedge.)

Poisonous trees or shrubs growing in a garden have led to legal proceedings when the leaves are eaten with fatal results by a neighbour's dog, a prize rabbit, goat, or other pet. Here the deciding factor is whether the leaves projected into the other man's garden, as in that case responsibility attaches to the owner of the tree or shrub, but not otherwise under ordinary circumstances.

Garden Chair. *See* Garden Furniture.

GARDENER. A gardener is a man-servant whose duties are to look after the garden, greenhouse, etc. He should, therefore, possess a good practical knowledge of plants, whether for the flower garden or the kitchen garden. He must know when each should be planted, dug up, or transplanted, and his judgement in these and other matters will be frequently tested. His duties include the care of the lawn, while a knowledge of the greenhouse and greenhouse plants is necessary for most gardeners.

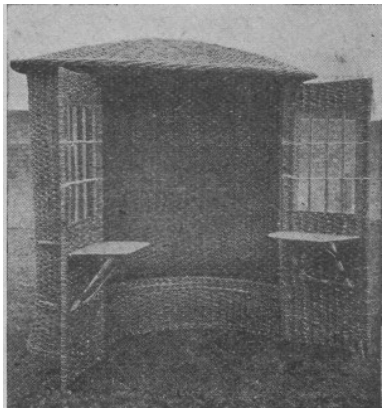
Some appreciation of colour is also desirable, as he should be able to lay out flower beds. The number of gardeners kept depends upon the size of the garden. In large ones there will be a head gardener and one or more under-gardeners. The best training for a gardener is to serve in a junior position in a large garden. As the gardener is a servant he must be insured under the National Health Insurance and Unemployment Schemes. The wages of gardeners vary in different districts. The jobbing gardener is usually paid 1/1 per hour. Many persons with small gardens require a gardener for only one or two days a week. Such can be hired at a fixed charge per day or per hour, either from nursery gardeners or privately. No licence is necessary, but in the case of a gardener hired privately one of the employers is responsible for the weekly insurance contributions. For some phases of garden work women gardeners are eminently suited, but obviously are less so than men for the heavier duties. There are in England several institutions where training can be obtained. They, too, must be insured, but no licence is necessary in their case. *See* Insurance.

GARDEN FURNITURE AND ORNAMENTS

Practical and Decorative Open-Air Furnishing

For other information of interest in this connexion see the articles on Bird Bath; Cane; Cushion; Hammock; Osier; Summer House; Sundial; Trellis; also Brick; Crazy Paving; etc.

Special furniture and accessories make the garden more enjoyable and healthful during the summer months; well chosen and placed ornaments give it decorative value even when flowers are scarce. The type of furnishing required for the particular garden needs almost as careful choosing as that for the interior of the house. Classical styles in seats and ornaments look well in the formal garden; rustic furniture, and the decorative touch of an old stone trough, or sundial, in the cottage garden; while in the seaside bungalow garden some kind of shelter is usually desirable as a protection against the wind. Here too the most modern type of furniture adds a gay note which suits the otherwise somewhat bare look of a new lay-out. A useful and attractive little osier shelter is shown in Fig. 1. Its roof is weatherproofed on the inside, and two windows admit plenty of light when closed against wind or rain. Revolving floors enabling shelters to face in any desired direction can be supplied.

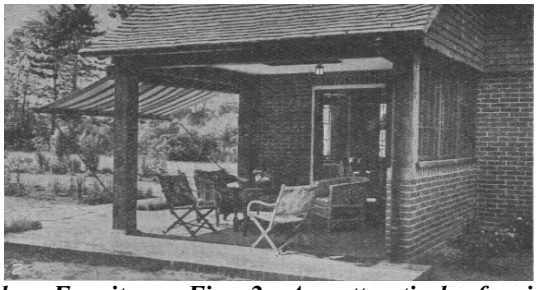


Garden Furniture. Fig. 1. Small but very useful and attractive osier shelter. (Town and Country Associated Industries, Ltd.)

Many houses, both old and new, have a practical extension into the garden either by means of a veranda, with or without windows which slide back on warm days, or by the simpler means of a bricked or flagged loggia outside the dining room windows, which can be delightfully furnished as shown in Fig. 2. Meals can be taken under shelter here, and yet in the open air. Plenty of folding or cane chairs, cushions, a table large enough for meals, and a hammock-couch, comfortably furnish such a corner. The important points about garden furniture are that it should be light to carry, should stow away into small space when not required, and that any fabric used for it should be durable, damp resistant and bright in colour. Nothing is more de-pressing out of doors than shabby, dingy chairs and cushions. Striped canvas in brilliant colours nearly always looks right, and for painted furniture blues, clear yellows, warm grey and ivory are the best shades from which to choose. In very hot weather for perfect shelter on the lawn from the sun a huge umbrella can be obtained fitted into a table, which when no longer required can be folded and stowed away.

Garden furniture will make a delightful change from the more formal interior of a town sitting room if a balcony or flat roof space can be utilized to provide accommodation for it, and sufficient greenery and

flowers in boxes and tubs introduced in order to create the outdoor feeling.



Garden Furniture. Fig. 2. An attractively furnished loggia.



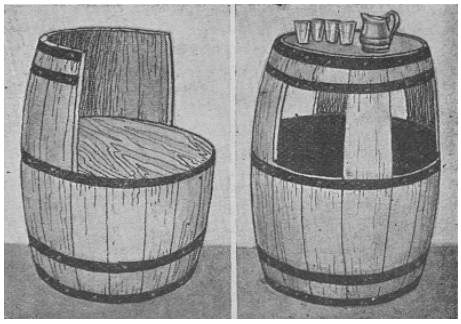
Fig. 3. Folding table and stools laid for a picnic lunch.

Strong teak wood is made up into good garden suites, and in it settees, armchairs, chairs and tables are obtainable. A square teak wood table is designed with slotted top so that rain water drains off quickly. Chairs are made in this wood with footboards to keep the occupants' feet dry. Metal furniture has for a much longer period been recognized as serviceable for outdoor than for indoor use. Folding chairs and tables of this type are made with rounded and shaped leg supports which do not make holes on a lawn. Padded ground cushions with back rests which can be raised when required, and book rests for use with them, are luxurious for lazing or reading. Oilcloth may be employed for the underside of ground cushions; raffia cloth is a good material for garden upholstery. Cretonne-covered mattresses with waterproofed lining and bolster cushions to match provide open-air sleeping accommodation.

A two-tiered wagon which can be wheeled out into the garden with all equipment for luncheon or tea, and converted into a table by touching a knob is a great convenience. Square stools made the same height as armchairs, and loose-cushioned and painted to match, can be used with these to form day beds, or without the extra cushions as convenient low tables. A group of a simple folding table and stools arranged as shown in Fig. 3 makes a pleasant tea or luncheon corner. The constructional details for a suitable folding table have been given in earlier pages.

Garden Chairs. Folding chairs for the garden are simple to construct when made of wood and striped canvas.

Fig. 4 shows a light garden armchair. The seat portion is made separately, like an ordinary camp stool, the crossing legs being of wood 1½ in. x ¾ in. and about 2 ft. 2 in. long, pivoted on pins burred over on washers. These legs are finished with a stout dowel at top to enter the seat rails, which are 1⅛ in. diameter. The canvas is turned in 1 in. at edges and brought over taut to be nailed to the underside of these rails. Height of seat when open can be 1 ft. 4 in. to 1 ft. 6 in.



Garden Furniture. Fig. 5. Useful garden seat and table made from two oak barrels, wax polished or oiled.

The armchair effect is obtained by separate wing returns, the uprights of which are 1¾ in. x ¾ in. x 2 ft. 4 in. long, and connected at ground by pivots to the cross legs of the stool. The arm rests are 2 in. wide by 1 ft. 3 in. long, or may be increased to 1 ft. 6 in. The three slats in each wing can be 2 in. x ½ in., and the bottom rail of the wing, entered about 8 in. above ground, can be 1¾ in. x ⅞ in., mortised and tenoned to uprights.

The uprights of back can be about 1 ft. 9 in. long, fitted with staples to drop into position in eyes on the back uprights of wing returns, a length of canvas being provided for the back after the back uprights have been connected by 1½ in. x ⅝ in. rails. On removing the back, the wing returns will fold up with the stool between, clips being fitted so that all will pack flat together with the back.

Another type of chair, as shown in Fig. 5, can be made from a barrel. An oak barrel is the best, as this wood when wax polished or oiled looks and lasts well. Such barrels can be purchased inexpensively. The illustration shows how the chair is made; inch timber is used for the seat, and the hoops are either stained a darker shade of brown in the case of an oak barrel, or if the chair is to be painted in a bright colour the hoops look well in black. Fig. 5 also shows an attractive table which is easily constructed from a barrel. Three-ply wood can be used for the middle shelf.

Garden Seats. A wooden seat is a practical family piece of garden furniture. It can, if well made and brightly painted and cushioned, be also quite attractive.

Such seats are usually constructed to accommodate three or four persons. For the former a length of 4 ft. 6 in. is necessary between the ends, and for the latter an overall length of 6 ft. 6 in. The seat shown in the sketch, Fig. 9, is intended for four persons, and could be made in painted deal or varnished oak, or, if preferred, teak.

In making the seat, start upon the ends, preparing the front and back legs, and framing in the rails and elbows. The top ends of the front legs should be turned

to the pattern shown at Fig. 15, and the back legs taper above the elbows to 2 in. thick and then swell out again to the full thickness, the shape being as at Fig. 12. Ordinary tenon joints (arranged as at Fig. 13) are used in framing the legs, rails, and elbows together. The front ends of the elbows are finished as shown at Fig. 12, and the seat rails are worked into a thickness of 2 in. in the middle. The front and back seat rails are then tenoned into the legs, each being kept level with the front edges of the legs, and the joints arranged as at Fig. 14. The cross seat rail which is framed between the front and back seat rails (Fig. 11) is intended to support the seat battens in the middle; its top edge is shaped to match the end seat rails.

The top rail is tenoned into the top ends of the back legs, and the back battens are tenoned between this rail and the back seat rail. The battens are spaced an equal distance apart, with the wide batten in the middle, while in the middle and every alternate batten a small heart-shaped opening is cut (Fig. 10). All the joints should be fixed with wood pins, but should first be painted with good lead paint. The seat battens are simply nailed or screwed in position. If made in deal the seat must be well painted, first with a priming coat and afterwards with two coats.

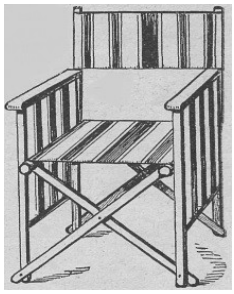


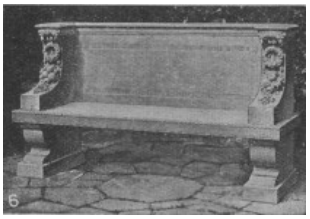
Fig. 4. Folding armchair made on the principle of a camp stool.

The cutting list given below applies to a 6 ft. seat. For lettering see diagrams.

	Long	Wide	Thick
	ft. in.	in.	in.
2 front legs (A)	2 1½	3	3
2 back legs (B)	3 6	3	3
2 bottom rails (C)	1 7	3	3
2 seat rails (D)	1 5	3	3
2 elbows (E)	1 11	3	2
Front seat rail (F)	6 4	4	2
Back seat rail (G)	6 4	4	2
Cross seat rail (H)	1 7	3	2
Top rail (J)	6 4	3	1½
14 back battens (K)	1 9	3	1
Back batten (L)	1 9	6	1
5 seat battens (M)	6 6	2	1

Garden Ornaments. An ornamental feature for an enclosed garden, a terrace, or the formal town layout is a stone seat like the one illustrated in Fig. 6. Such a furnishing detail deprives set fashions in bedding of their monotony, and is in keeping with either brickwork or crazy paving, and also with stone vases containing decorative evergreens and the bird bath or sun-dial of classical type. Fig. 7 shows a rustic stone seat suitable for the less formal garden.

Stonework gives a dignified air to any layout, however simple. Quite delightful ornaments are made from old stone troughs and sinks placed on two piles of bricks or on stone pillars to bring them table-high. Drainage holes having been provided, and a layer of rubble before filling in the soil, rock plants, ferns and mosses may be planted in these sinks with one or two pieces of rock placed to give the outcrop effect.





Garden Furniture. Fig. 6. Garden seat in Portland stone, with moulded ornamental ends. Fig. 7. Simple garden seat made from three pieces of rough stone. (6, courtesy of John P. White & Sons, Ltd.; 7, courtesy of W. H. Gaze & Sons)

Lead vases and ornaments give beautiful accents of colour among greenery. Wrought-iron is effective in the old-world garden of sophisticated, charm. Wrought-iron wall lanterns, gates, antique well heads and triangular rose pillars are all decorative pieces of garden furniture.

Statuary requires particularly careful choosing and setting. Ornaments of this kind can be easily overdone and give a restless, crowded effect. The line of low brick wall, topped by York stone, may be broken by one or two figure or animal pieces of good design. Stone dragons or owls treated in a formally decorative style look effective flanking shallow steps, or guarding a stone seat. Realistic animals and birds do not seem so appropriate for garden ornaments, though obtainable in a variety of designs. Pieces of old stone carvings introduced as reliefs on brick walls have a beautiful effect. Particularly effective for floral decoration on terrace walls are simple vases of stone such as the one shown in Fig. 8.

Pigeon cotes and bird shelters are always interesting. Little thatched bird-tables can be bought ready for placing on poles, and afford endless attraction and opportunity for nature study.

GARDENIA. This is a beautiful evergreen flowering shrub for use in the heated greenhouse, bearing rosette-shaped, strongly scented flowers with thick, waxy, white-petals. It was popularised as a buttonhole flower by King Edward VII, but as the habit of wearing buttonholes has to some extent declined, there is little demand for gardenias now, except for the purposes of funeral wreaths. Many people dislike the somewhat overpowering perfume emitted by this flower. The plant requires a humid atmosphere, and a temperature of about 70° F. Equal parts of well-drained loam and peat, with a quarter of decayed manure and a liberal admixture of sand, suit it. It is propagated by inserting the tips of young shoots
in sandy soil in a propagator in spring. If the gardenia is grown in the border of a stove-house, very little difficulty will be experienced so long as the atmosphere

(Continued in page 936)



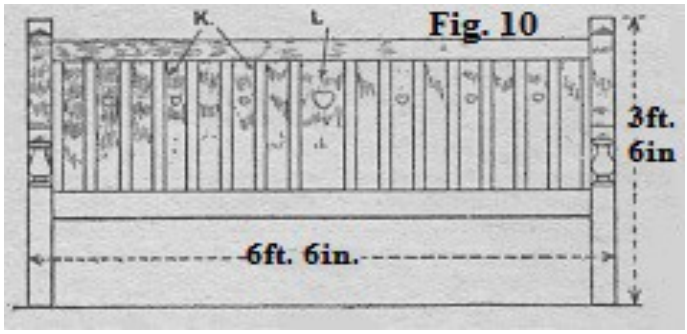
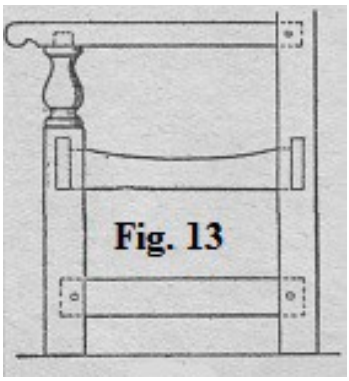
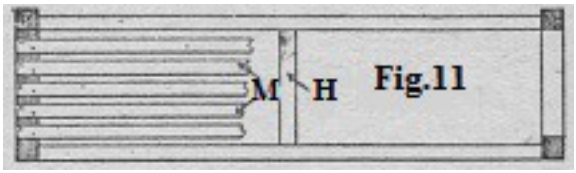
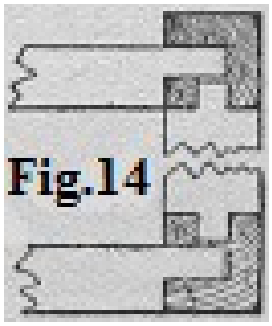


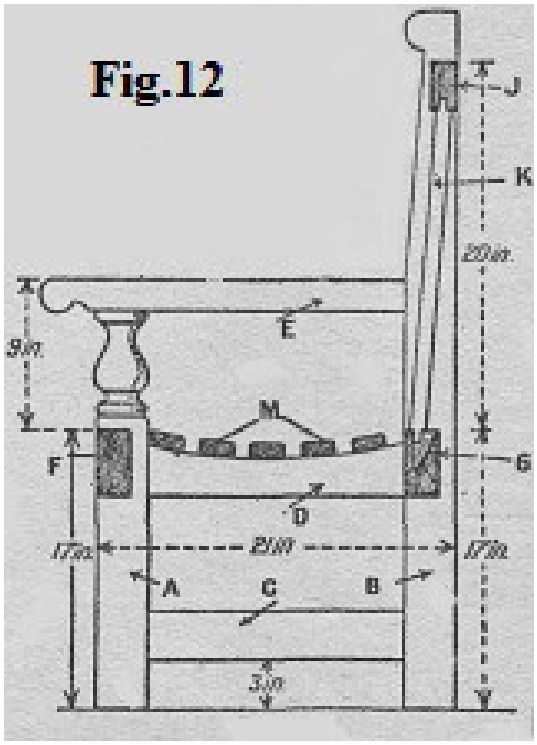
Fig. 8. Effective stone vase useful for floral decorations. (Courtesy of W. H. Gaze & Sons)
Fig. 9. Comfortable seat in oak or teak to seat four.
Fig. 10. Elevation, showing decoration of battens.
Fig. 11. Seat rails.
Fig. 12. Side elevation.
Fig. 13. Side showing tenon joints.
Fig. 14. Joints of seat rails and legs.
Fig. 15. Front leg. For key to lettering, see cutting list. (By arrangement with Evans Bros., Ltd., London)

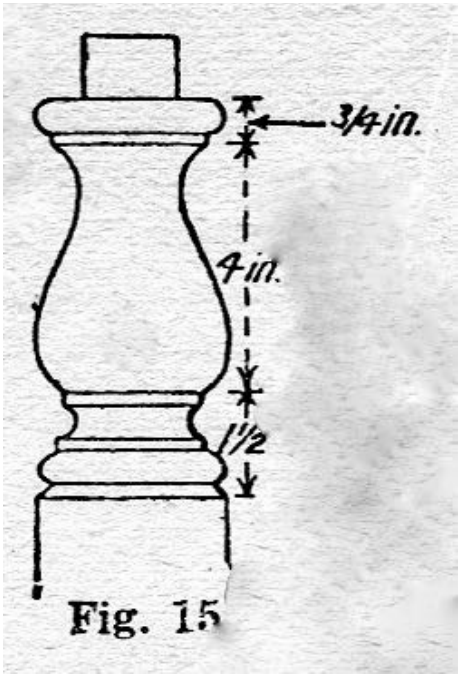




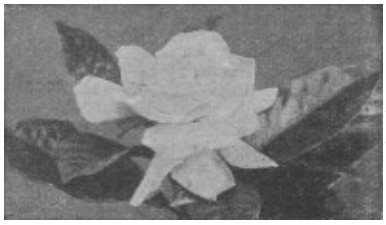








is kept moist and the foliage is periodically syringed. If mealy-bug and scale put in an appearance, the leaves must be sponged with insecticide.



Gardenia. Bloom of the white gardenia, a fragrant hot-house flower.

If no border is available, it is quite a simple matter to grow gardenias in pots. Very little pruning is required. Plants in borders require to be cut back occasionally to keep them within bounds and to preserve their shape. It is well, too, to tie down the lower branches, in order to prevent them from smothering the more prolific wood, which is usually situated in the middle of the bush. Gardenia florida is the kind commonly grown. *See* Flowers.

GARDENING: Some Hints. The gardener's first necessity is tools, and these should include a good steel spade, a stout four-pronged fork, a clean-toothed rake, a Dutch hoe, a five-clawed cultivator, large and small trowels, a pair of shears, a grass-mower, a birchbroom, pruning shears and knife, an insecticide syringe or sprayer, wheelbarrow, gloves and strong apron, and a garden line. A storing shed should be available wherein all equipment may be kept clean and tidy.

Site and drainage will be the beginning of all work. Digging and trenching must be studied, for earth preparation is the key to success in gardening. Soil composition and the application of suitable manures are other matters for study.

Practical guidance as to the preparation of seed beds, depth of sowing, together with the thinning and planting out of seedlings, may easily be obtained.

Flowers for cultivation make fascinating study for the gardener. The formation of a lawn is not a matter for haphazard undertaking. A well-kept and truly-laid sward, even though it be only a few yards square, must be made on definite principles. The planting of a fruit garden should be undertaken with suitable varieties of apples, plums, pears, etc. Pruning of branches and roots, perhaps grafting for the purpose of propagation also, will call for attention. In due course a greenhouse may be installed and equipped, giving additional interest. Frames and hotbeds also may find place, becoming a centre for early crops and for rearing tiny seedlings. Propagation by seeds and cuttings in greater variety becomes possible where such appliances are available, while the cultivation of choice but tender plants for indoor decoration adds pleasing occupation for gloomy days.

The beginner should early learn to distinguish between insect friends and foes, to become familiar with the best insecticides for the eradication of those that are harmful, to understand the value of spraying trees in season, and to apply suitable remedies for the cure or prevention of fungoid disease. *See* Digging; Fungicide; Spraying.

GARDEN PARTY. In Great Britain this form of summer entertainment is very popular. When it is provided by owners of large houses, people who may be invited only to this one function in the year are glad of an opportunity to see the gardens and also the reception-rooms, which are generally thrown open for the occasion. A tennis or croquet tournament, archery, or a cricket match may form the special attraction, and sometimes a company of pastoral players is engaged. Provision may be made for wet weather in the form of a large tent or marquee with an improvised stage.

In towns a garden party is often an At Home. Wherever the party is given there is music, either a band or a large or small orchestra, and such games as clock golf, croquet, etc. are provided for players, with chairs and seats grouped about. Tea may be served in the house or in a marquee.

A good plan is to have a separate marquee for drinks, ices, fruit, and cream, as people who are taking part in strenuous games appreciate these refreshments at more or less frequent intervals throughout the afternoon. Sometimes all arrangements for refresh-ments, tents, etc. are put into the hands of a firm of caterers. In the case of a large party this saves a strain on the household staff.

Receptions, concerts, plays by limelight and informal dances are sometimes given at evening garden parties. Semi-evening dress is usual for the women, evening dress for the men. Illuminations for the gardens are generally carried out by a firm of entertainment caterers; brilliant coloured paper lanterns, patterned with boldly stencilled designs, hanging from the trees, are an effective decoration. S*ee* At Home; Ices; Marquee, etc.

GARDEN ROLLER. A roller suitable for a small suburban garden should weigh about 2 cwt.; for large lawns or tennis courts the roller can be 5 or 6 cwt., or even more.



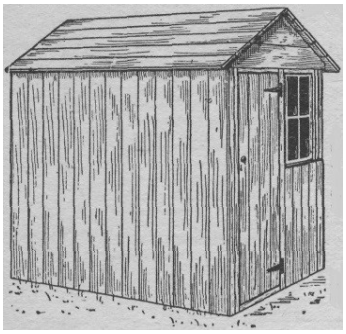
Garden Roller made from an oil-drum filled with concrete.

The usual types are made of cast iron, the smaller sizes with solid rol1ers; the larger have two rollers, and are generally made hollow and may be filled with water or sand to provide the requisite weight.

A good roller should have its edges rounded to avoid cutting lines on the turf. The handle should be balanced and remain upright when the roller is standing, and be available on either side of the roller, as this saves frequent turning. The bearings should be substantial and easily accessible for lubrication, a matter that should not be overlooked, for if the spindle and bearings are kept well oiled, not only will the machine be easier to push, but its life will be doubled. Rollers made of concrete are durable, serviceable, and

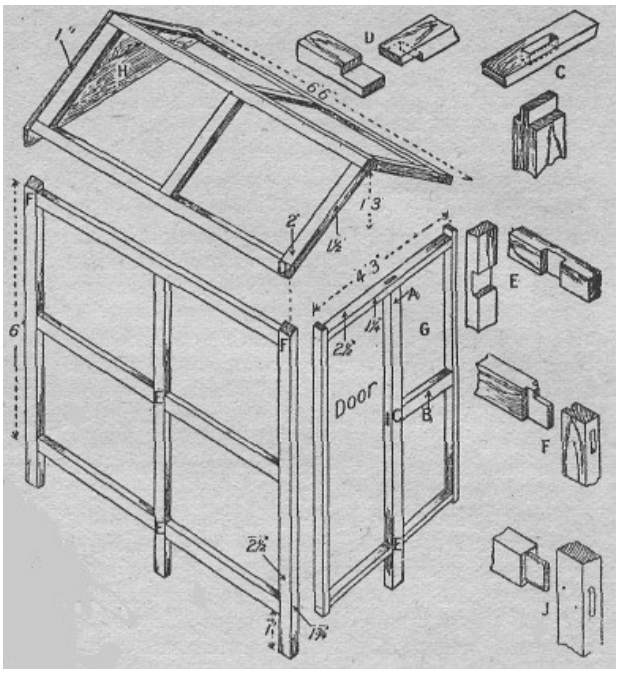
less expensive.

GARDEN SHED. The shed illustrated is made in sections, so as to be movable, and consists of two side frames, two end frames, and two frames which, when joined together, will make the top. Suitable sizes are suggested on the diagrams, but these may, of course, be modified for special purposes. The upright rails go into the earth at least a foot, and to prevent decay it is advisable to char the portion that is buried. This is better than dipping the ends in tar.



Garden Shed. The finished shed, with glazed window and plain wood roof.

Below, framework, with various joints enlarged.



Any rough straight-grained timber can be used for the framework, and when the parts are assembled, ¾ in. tongued and grooved flooring boards should be nailed round to complete the work. The top should then be covered with a good roofing felt, and a coat of tar will make a reliable and waterproof roof. The door is not illustrated in detail, consisting only of ¾ in. boards, nailed to three cross-pieces and hinged to the upright by T hinges. It may be braced as shown in the article Door.

The two side frames are mortised and tenoned together where the cross rails meet the uprights, as at the enlarged sketch F, and the centre upright is halved to the cross rails as at E. A simple and quick way of mortising and tenoning rough framing such as this is to take a ⅝ in. twist bit and bore out the mortises, leaving the top and bottom of the mortise half-round, as shown at sketch J; the tenoned portion is cut with a tenon saw, and a rasp is used to work away the corners, as shown. When putting the tenons into the mortises they should be smeared with thick paint, and secured by a couple of nails driven in from the face.

The end frame which will contain the door is also illustrated. The ends are nailed together, the long centre rail being tenoned into the top at A and halved at E; the cross rail B, is tenoned at each end. At G a window may be put in, if desired. The opposite end frame does not require a door, and in this case the rail, B, runs right across the frame, to be mortised and tenoned into the outside rails; while the centre joint, C, is halved together. The side frames are screwed on to the end frames so as to facilitate removal when necessary. The top consists of two frames nailed together, all the joints being halved together, as shown at D. The triangular end pieces are made previous to making the two top frames. The bottom of the shed should be made of old bricks or pieces of stone flag.

GARGLE: For Sore Throat. Gargles are not as much used in medicine now as formerly. Their place has largely been taken by sprays, which reach the back of the throat much more effectively. Gargles, however, are sometimes useful for applying drugs to the tonsils, soft palate, and for washing out the mouth. A mouthful of the gargle is taken, and the head is thrown back so that the fluid is held at the back of the throat. Then, without swallowing, the patient gently breathes out from the lungs, the air bubbling through the fluid. Gargles must never be swallowed. A very simple and effective gargle for cleaning and refreshing the throat consists of half a teaspoonful of common salt in a glass of water. This can be used every morning. An astringent gargle for a slightly inflamed or relaxed throat is made as follows:

Spirits of wine	1½ drams
Glycerin of tannic acid	4 drams
Water to make	6 oz.

A soothing gargle compounded from the following prescription is used for irritable sore throat due to dust, heat, etc.

Glycerin of borax	4 drams
Tincture of myrrh	1 dram
Water to make	5 oz.

An antiseptic gargle is often useful in cases of sore throat, especially where the breath is foul. The following may be tried:

Solution of potassium permanganate B.P. }	20 minims
Water to make	6 oz.

GARLIC. A bulb belonging to the onion family, garlic is noted for its pungency both of odour and taste. It is used far more generally upon the Continent than in Great Britain.

For ordinary purposes the bulbs are planted whole, 2 in. deep and 8 in. apart, in rows 9 in. from each other, in February. To obtain exhibition produce the cloves or bulblets must be pulled apart and planted separately. In late summer bulbs should be stored indoors.

Garnish. *See* Decoration in Cookery.

Garret. *See* Attic.

GARRYA. This is an evergreen shrub, 8' to 10ft. high, of which male and female flowers are borne on separate plants. It is the male or catkin-bearing form that is valued chiefly; the long, yellowish-green catkins which appear in early spring are very decorative. This shrub is not very hardy and, except in mild districts, ought to be planted in well drained loamy soil against a sunny wall. Little pruning is needed except to keep the plant shapely; this should be done after the flowers are over. Propagation is by layering in summer or by sowing seeds in a frame in spring. Pron. Gar-re-a.



Garrya. Catkins of the evergreen shrub.

GAS: FOR HEATING AND LIGHTING

How to Utilize Modern Appliances to the Best Advantage

This article corresponds to the one on Electricity in the Modern Home, and treats the subject in a general but comprehensive way. Gas Cookers are dealt with in the article Cooker, and reference should be made also to the one on Hot Water Supply. See further such articles as Brazing; Fuel; Qeyser; Grate; Heating; Kitchen; Soldering. Acetylene and Air Gas may be consulted.

The choice between gas or electricity for the essential services of lighting, heating, cooking and hot water supply is usually dictated by the presence or availability without much expense of one or other of the respective supply mains. When both electricity and gas are laid on, the householder is in the favourable position of being free to employ either or both as he wishes, limiting each to the use for which it is best adapted. For it may not be altogether wise to aim at an "all gas" or "all electric" house, as the case may be; the better way generally is to utilise both services, in conjunction perhaps with solid fuels, the latter being employed for some portion of the heating arran-gements. The choice will be governed, too, by the kind of stoves and fuel employed for cooking, and the preliminary remarks in the article Cooker may well be studied in this connexion.

There are also, of course, purely economic considerations. In many districts electricity is expensive, especially in certain rural areas; and the prudent householder, realizing what heavy demands on fuel are necessarily made by the kitchen, will prefer to use gas for cooking and electricity for the comparatively energy-economizing function of lighting. Again, the type of house he occupies may make it preferable to have a gas radiator to warm the hall—to give a certain gentle warmth which other sources of heat in those particular circumstances could not provide so well.

How Gas is Sold. For many years after it was first supplied to the public coal gas was used mainly for lighting purposes, and even since the introduction of the electric light, the incandescent mantle, an immense improvement on the old flat-flame burner has enabled it to hold its own as an illuminant with remarkable success.

So long as gas was used chiefly for lighting with flat-flame burners it was essential that it should burn with a self-luminous flame. With the increasing use of gas for heating purposes, and the general adoption of the incandescent mantle, which emits light because it is heated to a high temperature, the tendency became to take heating power or calorific value as the criterion.

This tendency culminated in the Gas Regulation Act of 1920, which introduced a new unit and a new method of charging the consumer. The Act provided that he should pay for the amount of heat represented by the gas he received, so much per therm of 100,000 British Thermal Units, one B.Th.U. being the quantity of heat required to raise the temperature of 1 lb. of water by 1° F. The gas undertakings have to declare the heating value of the gas they supply (so many B.Th.U. per cubic ft.) and to keep to it within close limits.

The Meter. The quantity of gas consumed is registered on the meter by several dials, the course taken by the hands being indicated by the numerals. One dial indicates hundreds of cubic ft. of gas up to 1,000; the next dial indicates from 1,000 to 10,000 graduated in thousands; and the third indicates up to 100,000 cubic ft., and is graduated in ten thousands. In larger meters a fourth dial is fitted which records hundred thousands of cubic feet. There is in addition a small dial on the top which has no bearing on the reading, but is used by the gas undertaking for testing purposes *(see* Fig. 1.).

Pay no attention to the top dial. Taking the lower dials in their order from left to right, write down the figures shown by the hands. If the hand is between two figures, always write down the lower; if the hand is between 9 and 0 always write down 9. Then add 00 at the end. The index shown in the diagram reads 751,900 cubic ft. If the reading of a month before had been 740,600 the month's gas consumption would have been 11,300 (the difference between these two totals) cubic ft.

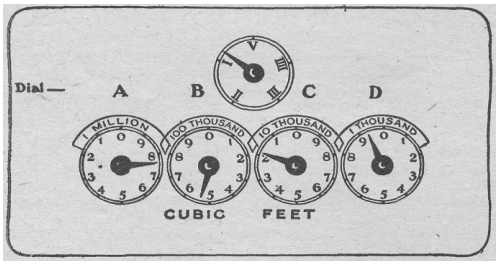


Fig. 1. Diagram showing dial of gas meter. It is read from left to right and here shows 751.900 cubic feet.

To convert the gas consumption into Therms multiply by the "declared calorific value of the gas" (generally a figure between 400 and 500 British Thermal Units per cubic ft.; the gas office will tell you exactly what it is for your district) and divide by 100,000 thus: 11,300 cubic ft. =

$$\frac{11{,}300 \times 450}{100{,}000} = 50.85 \text{ Therms.}$$

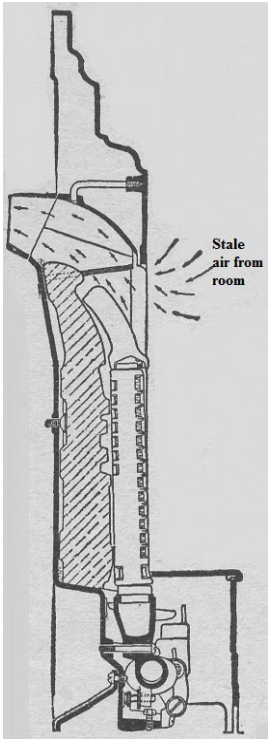


Fig. 2. Diagram showing ventilation system of a modern gas fire. (British Commercial Gas Assocn.)

Generally, in gas appliances, a Bunsen flame is employed, and the gas, before it reaches the burner, is mixed with the volume of air necessary to its com-bustion. Modern gas appliances are provided with means for making this adjustment, and if the consumer cannot make it for himself he should get his gas supply undertaking to do it for him. No one should continue to use a gas appliance which is not functioning properly, as a defect due to faulty adjustment is speedily remedied by a competent person.

Much gas is wasted by leaving burners alight when they are not wanted. Another source of waste is putting a small kettle or saucepan over a large boiling ring, or turning on the burner too high; a flame that spreads out from under the vessel and up the sides, is merely wasting heat. All vessels used on gas burners should be kept clean and should not be used on coal fires.

Coal gas is perfectly safe so long as it is confined to its supply pipes and is not allowed to escape into the rooms unburnt, but if this condition is not observed it becomes dangerous in two ways. In the first place, when mixed with from 5 to 15 times its volume of air it will explode violently if a light is brought in contact with it. This is the reason why it is unsafe, when a smell of gas is noticed, to search for the leak with a lighted match or candle. In the second place, gas will not support respiration; in other words, a person immersed in it will be suffocated because there is no oxygen in it for him to breathe. In addition, it contains a poisonous ingredient, carbon monoxide, which, by combining with the haemoglobin in the red corpuscles of the blood, prevents them from carrying out their function of taking up oxygen in the lungs.

Heating by Gas. **In domestic heating, two different forms of heat are dealt with, radiant, or radiated, heat and convected heat; it is in the proportioning of these that most of the strides have been made in the design and manufacture of modern heating appliances. Radiant heat is heat which is radiated by a hot body in rays. These rays travel out, in straight lines, and do not lose any of their heat until they strike an object which absorbs it. Roughly, the explanation of convection is this: As each particle of the air in contact with the hot body becomes heated, it also becomes lighter in weight than the unheated particles around it. Consequently, it rises and gives place to other particles of air, which also become hot, rise and follow the first. This makes room for a third set of cold air particles, which follows the others. In this way a stream of air issues from the hot surface, carrying heat with it, which it communicates to any cold body in its path.**

Radiation to any large extent only takes place from very hot bodies, such as glowing coals, red-hot iron, and incandescent bodies in general.

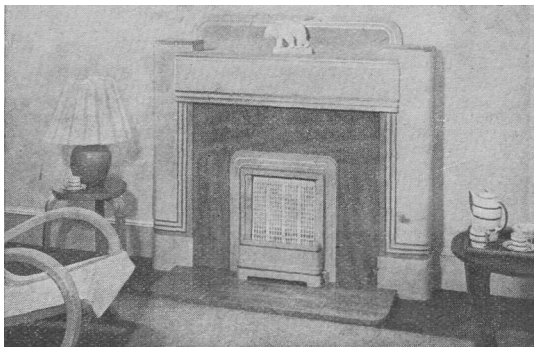


Fig. 3. A built-in gas fire suitable for a modern sitting room or dining room. The self-lighting mechanism is concealed in the base of the fire. (British Commercial Gas Association)



Fig. 4. A built-in gas fire of the wall panel type suitable for a small bedroom or hall corner. (British Commercial Gas Association)

The greater proportion of the heat given off by the

modern gas fire is in the form of high temperature radiation, the pleasant effects of which are well known. (It was the older type of gas fire, which utilised mainly the principle of convected heat and thus tended to dry up the air in the room, which gave rise to the belief that gas fires were unhealthy.)

Research has improved the design of the radiants used in gas fires so that a larger proportion of energy is given out in the form of infra-red rays that penetrate the skin and warm the blood, so that the heat emitted bears a closer resemblance to that derived from sun rays. The warmth of the modern gas fire, therefore, is in no way prejudicial to health in respect of "stuffiness" or "dry heat."

A gas fire is also a source of room ventilation. In estimating the comfort of any system of heating, the question of ventilation, upon which the humidity of the air and the rate of air movement are dependent, is equally as important as that of the actual heat source. The gas fire, with its controllability, helps to regulate not only the temperature, but the humidity and rate of air movement in the room. Any fire, while alight, changes the air in the room by imperceptibly drawing the used air up the flue and making space for fresh air to filter in through cracks and crannies round window and door; it is possible that the ventilating property of the gas fire gives several complete air changes in an hour.

Gas fires are of two main types, the self-contained and the built-in. The former can be bought in any style or period: so long as an adequate gas supply and flue are available it can be connected up without further adjunct. This type of fire projects slightly out into the apartment.

The built-in type is one in which the body of the fire is let into the chimney breast or mantel, and the front is fitted more or less flush with the surround. It can therefore be placed at any convenient height and in any position in the room in which a flue can be constructed. This type of fire is, in effect, a glowing wall panel, divorced from the stereotyped idea of hearth and fender. It does not need a chimney breast, the flue being formed in the wall by the use of gas flue blocks, but, if fitted in an existing fireplace, the coal grate must be removed and a suitable surround provided. Fig. 3 shows a fire of this kind. Surrounds may be of marble, imitation marble, wood, mirror glass or stainless metal.

The modern gas fire is generally finished in coloured enamel or in a bronze or stainless metal finish, whichever is chosen to harmonise with the room furnishings and decoration. Most fires have automatic ignition. There are three main types of such devices: flint and wheel; electro-catalytic (a platinum filament aided by the current from a small flash-light battery); and cold catalyst.

In selecting a gas fire of suitable size the following method (taken from "Domestic Utilisation of Gas" by Messrs. Smith and Le Fevre) may be useful:

1. Calculate the volume of the room — i.e. the length x breadth x height —in cubic feet. For every 300 cu.ft. provide one radiant.

2. For every 60 sq. ft. of exposed wall, add one radiant.

3. For every 20 sq. ft. of window glass, add one radiant.

Example: Room 12x10x10 ft. = 1,200 c. ft., exposed walls 180 sq. ft., window glass 40 sq. ft. Therefore

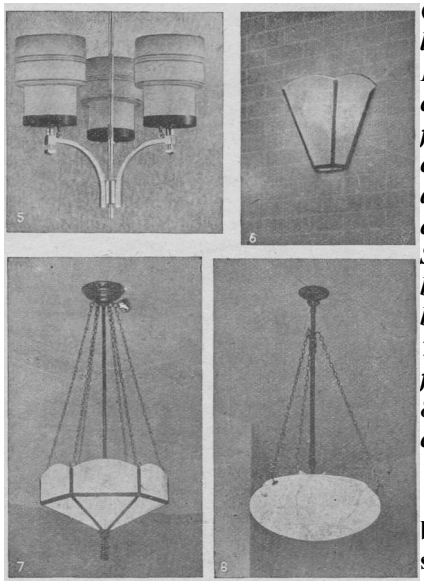
1200 : 300 = 4 radiants
180 : 60 = 3 radiants
40 : 20 = 2 radiants.

Thus 9 radiants are required. If the calculation indicates a number of radiants that does not coincide with a standard size of fire, the next larger size should be chosen. It should be remembered that the lattice-work type of radiant used in some fires has a gas-rate of approximately 5,000 B.Th.U. per hour, compared to one of 2,250 B.Th.U. with the latest pattern of ordinary upright radiant.

Gas Radiators. The independent gas radiator is a flueless heater which is lighted and turned off just as is a gas fire. Appliances of this type are largely air heaters, giving convected heat rather than radiant heat. They are suitable for warming entrance halls, landings, bathrooms and similar parts of the house. There is a number of ornamental designs available, the principle generally being that of a burner enclosed in the base of the appliance, the temperature being controlled in some models by a pre-set automatic device. For use in a garage a special safety type is made in which there is no risk of petrol vapour becoming ignited by the flame.

Central Heating by Gas. An automatically controlled gas-fired boiler may be used to heat the hot water for a small or large central heating system. The boiler takes up very little space, and is convenient and economical in use, particular advantages being the freedom from the bother of stoking and the absence of dust associated with any form of solid fuel boiler. A somewhat similar purpose is served by one type of gas air heater; fixed on an outside wall and provided with an air brick at the base; this appliance warms the fresh air that is drawn into the room.

Lighting Fittings. As gas is used to light a great number of homes artistic fittings are a matter of importance which has not been neglected by gas undertakings. It is not difficult to obtain fittings to harmonize with any style of decoration. Good bracket and applied wall fittings agree well with modern furnishing. Fig. 5 shows a three-branch chandelier in the modern manner. Glass and chromium relieved by narrow bands of coloured enamel are used on this sitting-room fitting. Fig. 6 is a simpler wall fitting for a bathroom or extra light in a kitchen, passage or scullery. The central sitting room fitting in frosted glass shown in Fig. 7 is of excellently balanced design, while Fig. 8 illustrates the favourite bowl type of ceiling fitting particularly suitable to a dining room.



Gas: modern lighting fittings. Fig. 5. A gas chandelier finished in chromium, glass and coloured enamel. Fig. 6. Simple wall bracket for bathroom. Fig. 7.Central fitting in frosted glass. Fig. 8. Bowl type of central fitting.

For kitchen and bathroom use silica shades are recommended, as they diffuse the light, last well and are not affected by heat. In a large living-room the central fitting can be provided with two or three mantles to afford extra light, as shown in Fig. 5, and in addition wall fittings are an improvement. When a local light only is required such fittings can be used without the central light.

For a hall a lantern lamp is a good choice, with sides of tinted and frosted glass and bottom of clear ribbed glass. The finish of the lantern may be in brass, copper, or egg-shell black. Gas standard lamps, as illustrated in Fig. 8, can be placed where required and attached by a flexible tube with rigid screw to a convenient gas point. They can be obtained either for floor or table purposes and in a variety of designs and finishes.

Useful Gas Appliances.

Gas cookers are described in the article Cooker. Other important uses for gas are to operate a refrigerator, and to heat the water for domestic purposes. These are dealt with under Refrigerator and Hot Water Supply respectively. A gas fired boiler is a convenient method of heating a conservatory or small greenhouse. The boiler is placed outside the building in a protecting hutch, so that the products of combustion are excluded. Such a heating installation may be controlled by a thermostat, which automatically regulates the temperature.

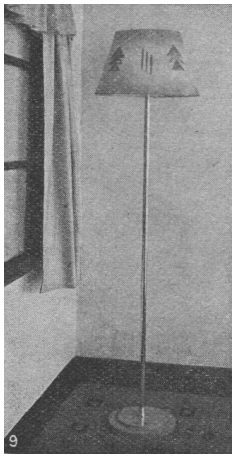
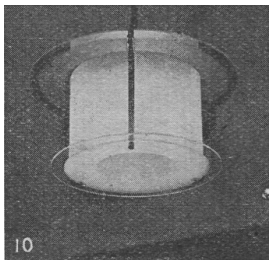
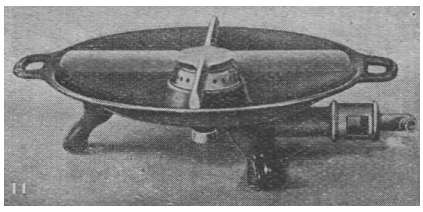


Fig. 9. A gas standard lamp finished in chromium and enamel. (Courtesy, B.C.G.A.)

The introduction of the gas plug point with bayonet fitting (Fig. 12), has made it possible easily to connect up such an appliance as a gas iron or gas poker (Fig. 13). The latter is used to ignite the coal or coke in a solid-fuel grate, and for this purpose is plugged into a special gas point. The poker is pushed into the grate and the gas lighted; neither wood nor paper is needed. The act of plugging in the flexible attachment automatically turns on the gas, while the operation is reversed when the connexion is removed from the plug point, the gas supply being automatically turned off. One gas poker may be used in turn to light several fires in different rooms, if, of course, plug points are in existence. There are two main types of gas heated flat iron; in one the appliance is internally heated by a gas burner, and the iron is, of course, connected to the gas supply pipe by a flexible tube. The other type is heated by placing it over a lighted burner on a stand. The latter is placed on the ironing table and is connected when in use to a plug point. Fig. 14 shows a useful fitting for bedroom or dressing room, comprising a burner which may be used for heating either curling irons or a small flat iron, as desired.



Gas. Fig. 10. Pendant in glass and chromium suitable for hall lighting. Fig. 11 (below): Boiling ring with enamelled drip tray. (British Commercial Gas Association)



In the summer the disposal of kitchen refuse is sometimes a problem, especially where no coke or coal fired grate or boiler is used. This difficulty may be overcome by installing a gas heated incinerator, the cost for gas being negligible.



Fig. 12. Plug point with bayonet fitting.

Gas Mantle.

This term is used to describe a manufactured article used in conjunction with a Bunsen burner for producing an intense light. There are two principal varieties, the upright mantle, used in a vertical position over the gas flame, and the inverted mantle, suspended beneath it.

The mantle should be carefully removed from the cardboard box in which it is packed, placed in position, and ignited by the flame of a match. This burns away the coating, and as soon as the flame has died down the gas may be turned on, and the mantle should give a brilliant, light. To ensure this, it is necessary that the mantle should be exactly upright.

The air and gas regulators on the burner should be adjusted until the best result is obtained. In the case of the inverted mantle a similar procedure is adopted, but here the mantle is fixed on a framework of steatite or similar fireproof material, and comprises a ring with three projecting lugs, which are slipped through slots in the bottom of the burner and rest upon little supports made for the purpose. For a small charge many supply companies undertake the maintenance of light fittings, cleaning them periodically and replacing broken mantles, etc.

Gas Ring or Boiling Burner. In its older form the gas ring consists of a hollow iron casting. This is in the shape of a pipe leading into a hollow ring, through the top surface of which a series of holes is drilled. The gas, which enters at the end of the pipe farthest from the ring and mixes with air at the inlet, issues through these holes and burns with a blue flame. The gas ring stands on cast-iron feet, and has vertical webs projecting up from the ring, in order to support a vessel. Fig. 11 shows the modern development of the boiling ring. The gas burner is set in a coloured enamel bowl which serves not only as a base, but also to catch any drips or overflowing liquid.

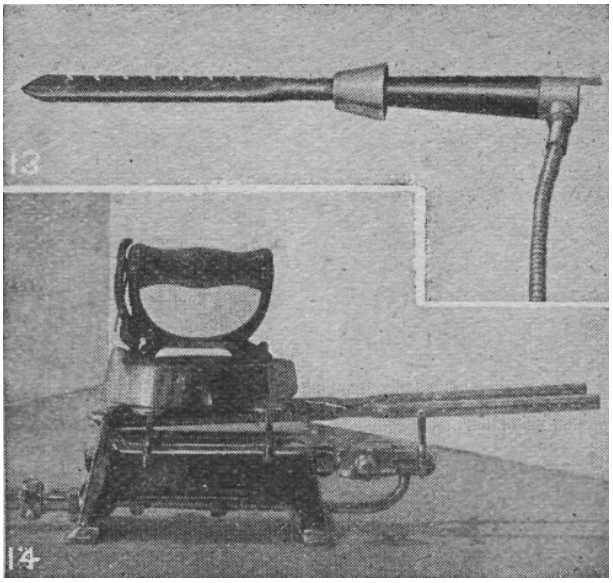


Fig. 13. Gas poker used to ignite coal or coke in a solid fuel grate. Fig. 14. Gas burner for heating curling tongs or a flat iron.

The only adjustments required as a rule with any gas ring are those of the gas pressure and the air. The flames of the jets should be adjusted by the gas pressure regulator so that they are just long enough to play over the full bottom surface of the vessel being heated, and they should never be allowed to lick round its sides. The air should be adjusted so that the cone in the centre of the flame is of a greenish colour, the rest practically colourless, and on no account luminous, otherwise gas will be wasted, the heating power will be too low, and the surface of the heating vessels will become sooty.

The central cone should be short, sharp, and steady, and the flame should hiss a little, while having at the same time no tendency to backfire when the flame is turned down low. Otherwise the burner is getting too much air. The positions of both the gas pressure regulator and the air regulator should be capable of being fixed by means of a set screw when the final adjustments have been made, so that they do not get out of position when the ring is being used.

Boiling Water at Will. Small gas water heaters of the instantaneous type are used to provide the kitchen with its own hot water supply. The latest development in the sink water heater is a similarly shaped appliance (shown in Fig. 15) which will deliver hot, very hot or boiling water, whichever is needed. The three grada-tions are obtained merely by turning a tap and the appliance is automatic in action, using gas only when hot or boiling water is running. At the setting "Warm" 1¼ gallons at 90° F. are delivered each minute; at "Hot," the flow is ½ gallon a minute at a temperature of about 150° F.; while the control set to "Boiling" gives a flow of about 2½ to 3 pints per minute of boiling water, suitable for tea-making or any other purpose.

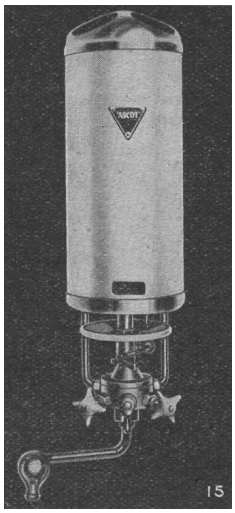
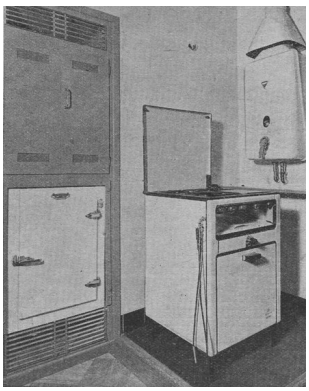


Fig. 15. Small "Ascot" water heater which automatically gives hot, very hot, or boiling water. (Courtesy, B.C.G.A.)



Left, Fig. 16. A modern gas-equipped kitchen. On the left, a built-in gas refrigerator. Centre: the latest design in gas cookers with gas match for easy lighting. On the wall (right) is a multipoint instantaneous gas water heater which supplies the whole house. (British Commercial Gas Association)

GAS: Poisoning by.

Many deaths are reported every year from suffocation by the breathing in of ordinary illuminating gas. Besides these acute cases, fatal or otherwise, vague illnesses, slight headaches, mental depression, and anaemia often result where a person for hours and days breathes in even tiny quantities of coal gas.

Prominent symptoms in acute poisoning are drowsiness, varying from a slight degree up to the deepest unconsciousness, with a bluish purpling of the complexion, stertorous breathing with puffing out of the lips at each expiration, and perhaps frothing about the mouth.

Remove the patient from the polluted atmosphere, see that the mouth and throat are clear, loosen tight clothing, and, if breathing has stopped or is shallow, carry out artificial respiration. The doctor is to be summoned at once. Even after apparent complete recovery, the patient should remain lying down in bed for at least 48 hours. *See* Artificial Respiration.

GAS ENGINE. This is a form of internal combustion engine which uses gas as the fuel. In its commonest form the engine is designed to work on coal gas, but types adapted to other forms of gaseous fuel (e.g. producer gas) are similar in general characteristics, differing only in details of design. Most small gas engines operate on the Otto or four-cycle principle. *See* Internal Combustion Engine.

GASKET. This is a thin packing piece of metal, asbestos, rubber, paper, etc., used to make a gas or watertight joint between metal surfaces. The gasket used for the cylinder head of a motor car engine is often formed of a sheet of asbestos between two layers of thin copper. Each side is given a thin coating of gold size. For joints not subject to heat a gasket of thick brown paper coated with grease may be used. *See* Motor Car.

GASLIGHT PAPER. Gaslight paper differs from bromide paper (q.v.) in being very much slower, but a gaslight print has much more snap or brilliance than one on bromide paper. The most brilliant prints are given by the so-called vigorous or contrasting grades. There are other grades, usually called normal or portrait, which give softer prints. These are the best to use for negatives which have plenty of contrast and would yield too hard or chalky pictures if printed on the vigorous paper.

The requisites for gaslight printing are simply a supply of developer and fixing bath, and some 10 p.c. solution of potassium bromide. The best developer is that made up with metol and hydroquinone with other chemicals. This developer may be bought ready made up in liquid, powder or tablet form, and is often sold as M.Q.

The 10 p.c. solution of potassium bromide is made by dissolving 1 oz. of this chemical in 9 oz. of water. The fixing solution can be made up with an acid fixing salt, or it may be compounded as described under Fixing.

There are two methods of working. One is to carry out the process in an ordinary lighted room and to handle the paper so that light does not strike it directly, by setting up a screen and carrying out the manipulation of the paper in its shadow.

The other method of working is by bright yellow light. A dark-room lamp with a light yellow glass or paper screen may be used, or a hanging electric bulb simply wrapped in a large sheet of yellow tissue-paper. Gaslight paper may be exposed for any length of time to such light without being fogged.

A sheet of the gaslight paper is put behind the negative in an ordinary printing frame and exposed to light. Daylight is too powerful a light except for very dense negatives. The best light is an electric bulb of about 40 candle power, or an incandescent burner, with either of which, at about 6 in. distance, the exposure for an average clear negative will be about 15 sec. Different makes of paper vary in speed, but the instructions supplied with each indicate the exposure required.

For development, the sheet of paper is laid, coated side up, in a clean dish an inch or so larger each way than the paper, and 4 oz. of the developer poured evenly over it. If the exposure has been neither too long nor too short, the picture will appear clear and brilliant. With most papers, e.g. Velox, the picture reaches its full depth in an instant; with certain others it develops more slowly, requiring about a minute. With either kind of paper, if exposure has been correct, the picture does not become too dark through remaining for a longer time in the developer. But if exposure has been too short, the picture comes up pale or shows only the shadows. Too much exposure causes the picture to become much too dark and also very flat very quickly. Trial of different times on small pieces of paper will show the correct exposure. If the print which has been given the judged best exposure is still rather greyish in what should be the white parts, e.g. the sky, and also rather weak in the deep shadows instead of a rich black, it is a sign that the developer needs tuning up with a little bromide. Try adding 1 drop of the 10 p.c. bromide solution to 4 oz. of the developer. If not enough, add a further drop, and so on up to about 6 drops. As each print is developed it is rinsed in clean water and put into the fixing bath.

It is most important that the print should be fully immersed, and that the fixer should, on no account be splashed or carried by the fingers into the developer.

The best plan is to let the print fall face down on to the fixing solution and push it in with a strip of hardwood or an ebonite print paddle. As prints accumulate in the fixer they must be separated and kept on the move. The stick or paddle allows this to be done without the fingers touching the hypo solution. Prints should remain in the fixer for at least 10 min., but it must not be used for too many, or the later prints will discolour. Twenty ounces will fix about 100 4¼ by 3 ¼ prints, but it is best to use it plentifully.

Care should be taken that no part of the surface of the print is exposed to air action for more than a few seconds. Use tweezers for small prints, or a print paddle for keeping larger prints underneath the fixer without wetting the fingers.

After fixing the prints are washed for an hour in water as described under Washing. When washed, prints are hung up, or laid face up on blotting-paper, to dry. They must not be pressed between blotters or dried by heat, for the wet gelatine surface is easily damaged. *See* Developer; Developing; Fixing; Metol; Toning; Washing.

GAS PIPE: Its Utility. Gas piping, or gas barrel as it is often known, is made principally in wrought iron and mild steel and sold in long lengths; it is also obtainable in short lengths from about 12 in. upwards.

Flexible metallic gas pipe in sizes from ¼ in. to ⅜ in. or more is used for connecting portable gas appliances. Wrought iron gas pipe with stock fittings such as angles, tees, and junctions, is useful to the handyman, as by its aid a variety of articles of everyday utility can be constructed.

Gas pipe is sold according to the nominal diameter, i.e. the ½ in. gas pipe is nominally of ½ in. diameter in the bore, or hole through the pipe, but actually measures .825 in. over the top of the threads, or rather more than ¾ in. in diameter. The ⅛ in. pipe, which is the smallest iron pipe that is made, measures .382 in., or rather more than ⅜ in. in diameter. To avoid confusion it is desirable to specify particularly when purchasing fittings whether they are required to be screwed for iron or brass, remembering that a ¼ in. iron pipe is, practically speaking, equivalent to ½ in. or ⅝ in. brass pipe.

In purchasing iron gas pipe it can be cut and screwed to any desired length. Usually the pipes are supplied screwed at each end and one end fitted with a connecting socket. The short lengths of pipe from 12 in. to 23½ in. are known as pieces, and above that length as pipes.

Gas Stove. *See* Cooker.

GASTRIC ULCER. The lining of the stomach is able, in its normal state, to resist the corrosive, or digestive, action of the gastric juice, but when its vitality is impaired part of the lining is digested off, leaving an acute ulcer. The devitalisation of the lining is almost always due to bacterial poisoning, and this may have a definite origin, such as septic teeth, a diseased appendix or gall bladder, or chronic stagnation of the contents of the large bowel.

Acute ulcers are usually multiple and may occur on any part of the stomach lining. It may chance that an acute ulcer does not heal, becoming chronic and possibly persisting for months or years. This may sometimes be due to coarse, irritating food, but it appears to be definitely associated as a rule with delays in the emptying of the stomach due to spasm of the pylorus. There may be various causes for this, but it is generally believed that excessive smoking may be one of them.

Acute gastric ulcers may be present without causing symptoms. There may, however, be dyspepsia and vomiting of blood. A chronic ulcer causes pain which comes on from a few minutes to one or two hours after eating and is generally relieved by vomiting. There is always blood in the stools.

The treatment of an acute ulcer consists of rest in bed, a bland diet and a free administration of bismuth and alkalies. Chronic ulcers are treated in the same way, but in certain circumstances an operation becomes necessary. *See* Indigestion; Stomach.

GASTRITIS. Inflammation of the lining of the stomach, otherwise gastritis or gastric catarrh, may occur as an acute disorder or may be chronic. Acute gastritis may be caused by overloading the stomach with food; by taking decomposing food, an accident more likely to occur in hot weather; by an alcoholic bout; or by taking some other poison capable of causing irritation.

At the beginning the patient feels dull and depressed and usually suffers from headache. There is fullness in the pit of the stomach, a sense of weight and perhaps pain. Nausea is felt sooner or later and culminates in vomiting. At first the vomited matter consists of undigested food, but later there is much mucus and bile. In children there is diarrhoea, with colicky pains, as a rule.

In the treatment of acute gastritis it is obviously desirable to clear irritating contents out of the stomach, and this may be done in a natural way by the onset of vomiting, which should be encouraged rather than otherwise. By drinking large draughts of tepid water the patient will make the process of vomiting easier and will help to cleanse the stomach. To clear offending substances from the bowel 2 or 3 grains of calomel may be given, to be followed by a dose of salts in the morning.

No food should be given if the vomiting tends to recur, but as much plain water or soda water as is desired. As the symptoms abate, milk in some form should be given. Thereafter, arrowroot or other milk foods are added, and then sweetbreads or steamed white fish. Ordinary food is not resumed for two or three days.

Amongst drugs most used for calming the irritation of the stomach preparations of bismuth take the chief place.

If acute gastritis is at all severe, or even when it is mild if the cause is obscure, treatment should be superintended by a doctor.

Chronic gastritis may follow an attack of the acute disorder, but more frequently begins insidiously. It may be caused by habitual over-indulgence in food or alcohol, in tobacco and, in some parts of the world, in iced drinks. Habitual failure to chew food properly is another cause. Many suffer from the disease from swallowing septic discharges from the teeth, tonsils and adenoids.

The treatment of chronic gastritis cannot be safely prescribed until a careful investigation of the habits and functional condition of other organs besides the stomach permits of a fair estimate of the underlying cause or causes. Sound dietetic habits must be insisted on; alcohol should be discontinued, and if tobacco is used at all it should be very moderately. *See* Indigestion; Stomach.

GATE. In its domestic sense a gate refers to the outer entrance to a house, or to the movable part of a

fence or wall. Gates leading to suburban houses are frequently made of cast iron in a stock pattern, but the practice in more modern work is to employ oak or other wood. A design for an entrance gate is illustrated in Fig. 1, the making of which is more or less similar to that for a field gate. The joints are mostly the mortise and tenon, secured by a wooden peg. Staves or pales are nailed on with galvanized iron or copper nails. The field gate illustrated in Fig. 2 is a typical example. Commence by making the stile or upright to which the hinges are fixed; mortise the top bar and then the other bars into it. Prepare the other stile in the same way. The top bar is tapered on the underside as shown, and mortised to take the three upright pieces, noting that two of them come behind the centre line and one in front of it. Next prepare the diagonal member and mortise it into the top bar and into the stile. When fitting the diagonal, arrange for it to carry some of the weight by giving the top bar an initial upward inclination.

Fix the stile, top bar, and diagonal first, then fit the outer stile and horizontal bars, driving them together with a mallet to make sure they are properly home. Secure all these joints with wood pegs properly draw-bored (q.v.). Then fix the uprights, peg them to the top bar, and nail them to the others. The metal work can be purchased ready for use, and only requires bolting in place with coach bolts and nuts.

The hanging of a gate calls for some care if it is not to drop before it has been long in use. The chief requirement is a very secure hanging post. For a carriage gate, if an oak post is used, it should be at least 6 in. square, and 2 ft. in the ground, or more if the soil is light. An oak gate post should be sawn to shape at the top and left in the natural form of a tree stump at the bottom, this part being known as the butt. To set up the post, dig a hole on the side where the gate will be hung. Try the post in place and, when it is all correct, strut it up with temporary battens and pour in sufficient strong concrete to fill the hole; ram it well, and leave it for a day or two to set hard; then drill the holes for the gate nooks, or the pegs on which the hinges turn.

These pegs are bolted in place or, for a light gate, may be driven in with a hammer; they should be so positioned that the gate has a tendency to swing shut of its own accord. The shutting post is fixed in a similar manner, and carries the catch of the latch.

Ornamental gate posts can be made of brickwork or concrete, some very decorative effects being possible with these materials. Those made of brick must have proper concrete foundations; those made of concrete require similar foundations, but may be reinforced with a central bar of iron about ¾ in. diameter. They are usually cast in a wooden mould and can be erected as described for a wooden post.

Many devices have been adopted to hold a gate shut, some of which are illustrated in Fig. 3. They are mostly of iron, wrought or malleable. Means to close a gate automatically include the spring, a weight suspended by a cord running over a pulley on the gate post and attached to the gate. A simple device to accomplish the same result is to adjust the rides so that the upper is nearer the gate post than the lower ride. Thus the gate will always swing shut. Practically the same effect can be more generally obtained by inclining the top of the gate inwards.

Attention to a gate includes periodical oiling of the hinges and the repainting of all woodwork at least every three years, unless the gate has been treated with wood preservative, when similar material must be used instead of paint. Oak gates that have not been painted can be kept in excellent condition by brushing them with boiled linseed oil. When a gate has worn and sags it can often be corrected by removing the rides and resetting them. *(See next page for diagrams)*

GATE-LEG TABLES & THEIR MAKING

With a Useful Model for the Amateur Carpenter

Other articles in this work on various kinds of tables include Afternoon Tea Table; Dining Table: Folding Table, and Kitchen Table. Consult also the entries on Amateur Carpentry; Cabinet Making; Dovetail Joint; Drawer; etc.

The gate-leg table was introduced into England in the 17th century. It developed from the type of table on which the flaps when in use were supported by movable hinges of wood. Instead of these two additional legs were provided which were hinged and could be moved back when the flaps were let down; from their shape they were and are still known as gates.

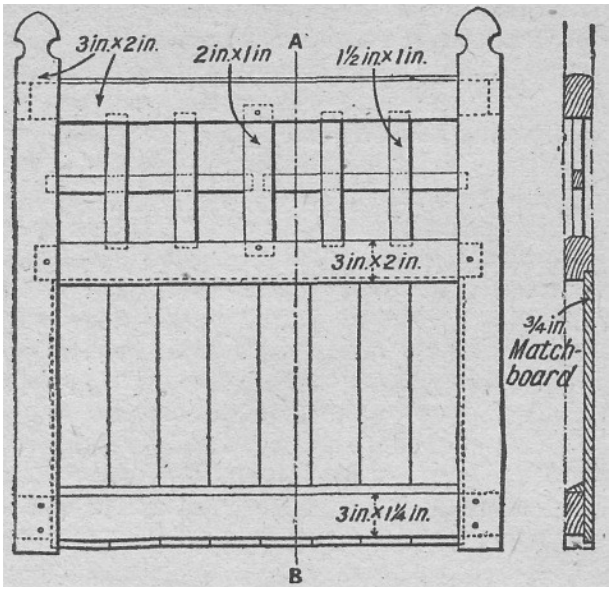
The majority of these tables were of oak and circular or oval in shape with four legs, but others were square or oblong in shape and were fitted with one, two, or four gates. Some tables have drawers at the ends, while others have the turning known as barley sugar on the legs. Such variations are not likely to date earlier than the latter half of the 17th century.

The gate-leg table, especially the round or oval variety, has been much reproduced by modern makers, as it agrees well with oak dining-room and hall furniture and also suits the small rooms of the cottage house.

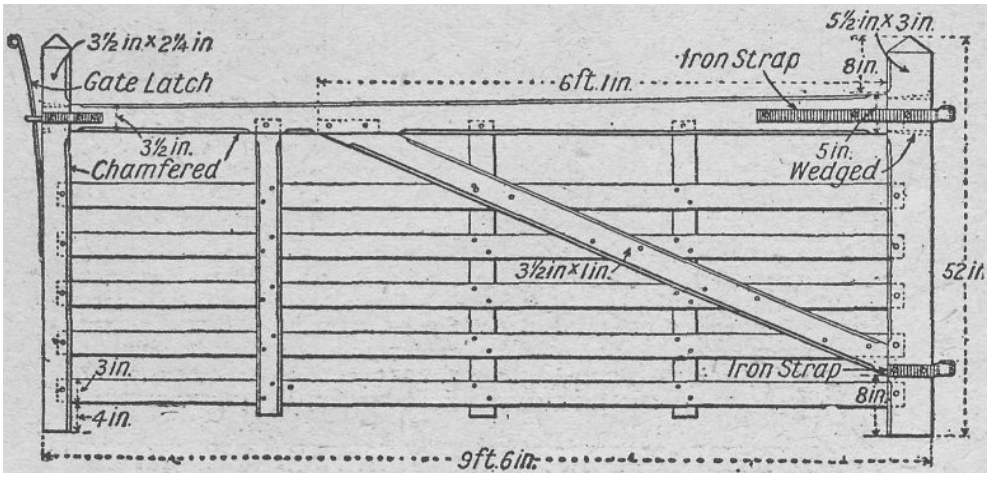
One authority thus speaks about the age of these pieces: "Their age may be roughly arrived at by a careful examination of the turned members of the legs and, where they occur, of the rails and stretchers. Early ones are coarser in design than the later ones. The turning may be a perfectly simple series of balls one above the other, or a pillar with rudimentary cap and base, and the stretchers heavy and near the ground. These tables were nearly always made of oak, and some of the early ones have carved tops. An early date may be assigned to those examples which show an arcaded pattern at the ends carved between the upper part of the legs."

The type provides a good size of top so that the table can be used for dining purposes, though it is really more convenient as an occasional table in the living-

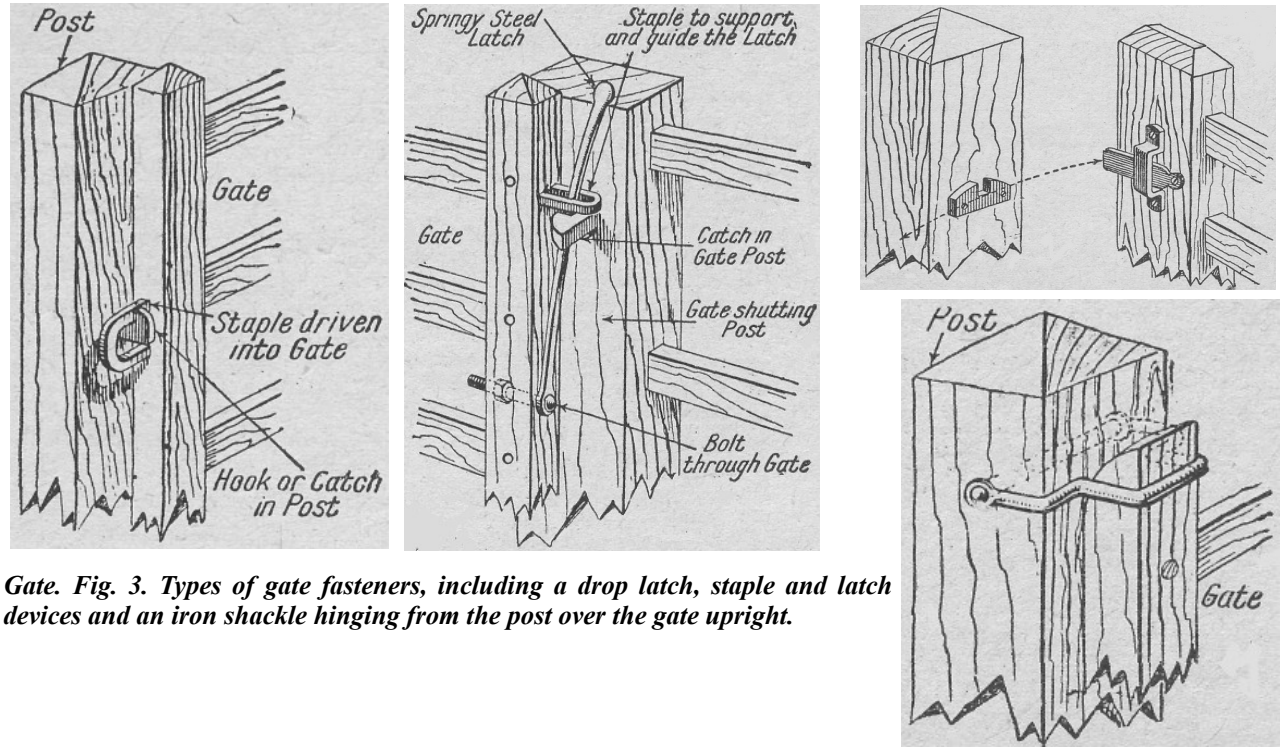
(Continued in page 947)



Gate. Fig. 1. Diagram showing construction of simple entrance gate. Right, section through gate on line A—B.



Gate. Fig. 2. Details of a common type of field gate.



Gate. Fig. 3. Types of gate fasteners, including a drop latch, staple and latch devices and an iron shackle hinging from the post over the gate upright.

room, as it can be closed down to occupy a small space. Another advantage is that a drawer may be fitted without interfering with the movable parts of the piece.

Making a Table. Fig. 1 is a table of useful size, measuring 5 ft. by 4 ft. when open, and shutting down to a width of 1 ft. 4 in. It is advisable as a preliminary to set the job out so as to get the right shape for the oval top and the correct arrangement for the turnings. A full-size drawing of the legs must be prepared to take to the turner. Probably a suitable set of legs and swingers, ready turned could be purchased from a local timber merchant, if the turning presented any difficulty. Notice that the legs are all the same shape except the inner legs of the gates, the ends of which have two ¾ in. dowels turned, upon which the gates swing (Fig. 2).

Start by getting out the material for the legs from 2 in. oak; square them up and mark out the mortises for the rails. At the drawer end two rails are put at the top, the upper one being dovetailed (Figs. 3 and 4). A drawer may be put at the other end as well if desired, or altogether omitted, in which case a plain rail similar to those at the sides must be used. When marking out the mortises be careful to see that the inner edges of the top and bottom rails come exactly the same distance apart as the length of the inner gate leg, measuring between the shoulders (Fig. 2). All the rails are then prepared and the tenons cut; the top rails are out of 1 in. stuff and the lower ones of 2 in. squares. A moulding is worked along the top of the lower rails to lighten the appearance, but this may be dispensed with by simply rounding the edges over.

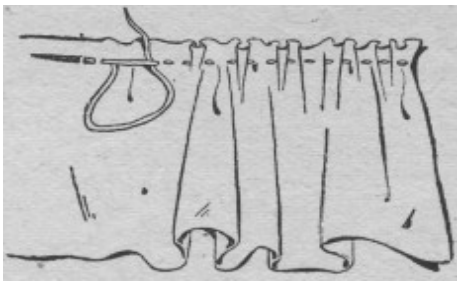
All the joints having been cut and the turnings finished, the two ends and the gates may be glued up and allowed to set. The holes to take the dowels of the gates are bored and the outer legs of the gates cut away as in Fig. 1, so that they close in flat with the side of the table. The side rails may be glued up, fitting in the gates and testing the job for squareness. It will be necessary to join the flaps up in pieces to get the width,
and a great deal of waste is obviated by joining them up in accordance with the full-size drawing, so that shorter pieces are used for the outer edge.

In better class work, instead of a square edge being left at the hinging sides (Fig. 7), a rule joint is used, shown in detail in Fig. 5. Fig. 6 is useful in a long table, as it ensures the main top and the flap being always level by reason of the bead fitting into the corresponding cavity. The rule joint, however, is the best, and presents no great difficulty if the essential principle upon which it works is clearly understood.

The curve for the two parts must be struck from exactly the point occupied by the centre of the hinge, and the squares above the hinge and on the flap must run diametrically to the circle thus struck, as shown by the dotted lines in Fig. 5. Plane the wood up true and thickness it and square the edges to form a close joint. Now set a gauge to half of the diameter of the circle and gauge both sides of the top and the underside of the flap. The depth of the square also must be marked. The surplus wood is then cut away and the parts tested together.

Back-flap hinges are used, the knuckles being sunk into the wood to get the required centre No grease nor any lubricant must be employed until after the job is polished, as grease prevents the stain from taking properly. Before fixing the top, runners and kickers are attached, as shown in Figs. 4 and 8. The drawer is either dovetailed or rebated together. The top is fixed down with screws from the underside, putting them through the rails skew-wise. The table is opened, the top levelled off, and cleaned up, two stops are secured to the underside of the flaps to prevent the gates from opening too far. (*See next page for diagrams)*

GATHERING: Of Material. Large or small puckers in cloth that are made by running a thread through any fullness of material to be reduced, and drawing it in to the required size, are known as gathering. Different weights and kinds of material require different treatment in gathering up the fullness. Thick velours and serges do not gather well, and any surplus fullness should be taken away or pleated, to avoid unnecessary bulk, very little material being left to gather or ease into the band or tighter edge of the material. Most silks gather easily if a thread is run evenly through the fullness ¼ in. from the edge. The smaller the stitch the finer the folds will be when drawn up.



Gathering. Example of ordinary form.

All fine gathering in cotton and linen materials, especially in making babies' and children's clothes, should be stroked before they are placed into a band or yoke. It is wise to use a double thread for any gathering which is to be stroked, and draw it up tightly, securing it at one end by twisting it round a pin. Take a needle without a very fine point, and, placing it between each tiny fold, draw it swiftly down, making a fine stroke with the point, and drawing the gather under the left thumb. If this is carefully done, each fold will be of uniform size. In hemming down the inner side of the band or yoke on to gathering which has been stroked one stitch should catch each fold.

Rows of gathering 1 in. or less apart are sometimes used as a trimming. It is often effective if used on light material for summer frocks or children's clothes, and forms the preliminary work in smocking (q.v.); a strong or double thread should be used for this purpose.

GAUGE. A gauge is an instrument used to compare an object with another of known and accepted

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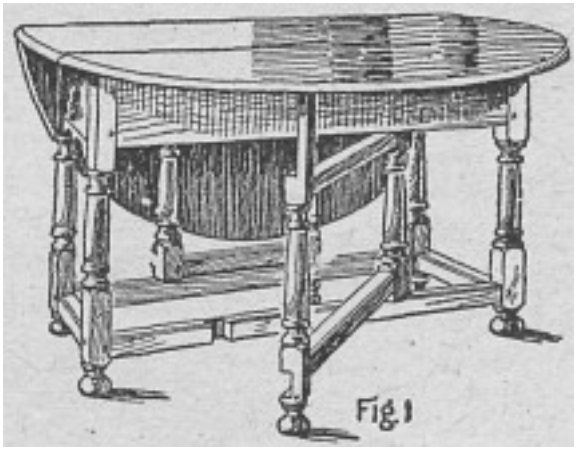
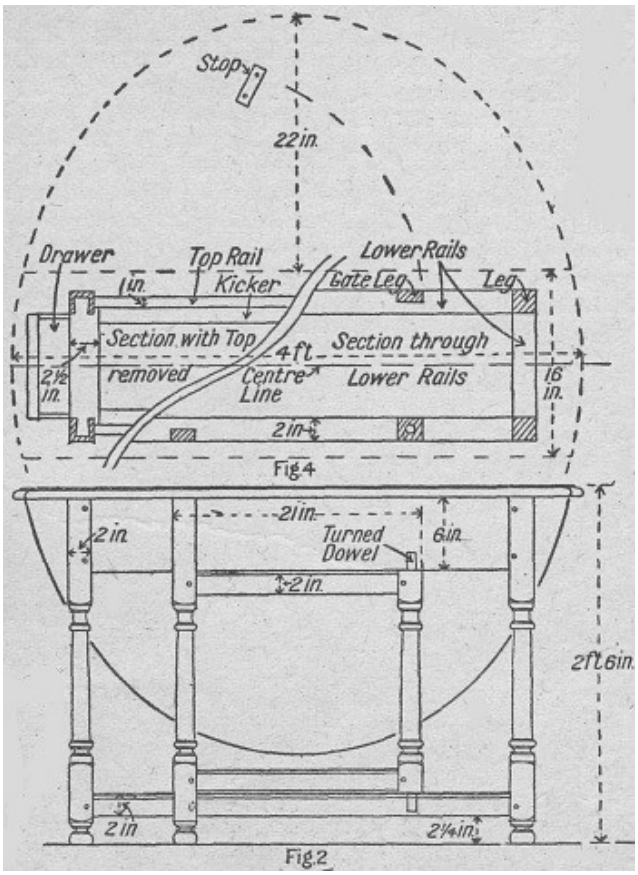


Gate-leg Table. Fig. 1. Oval-topped oak table.



Right. Fig. 2. Legs, showing turned dowel of inner gate-leg.

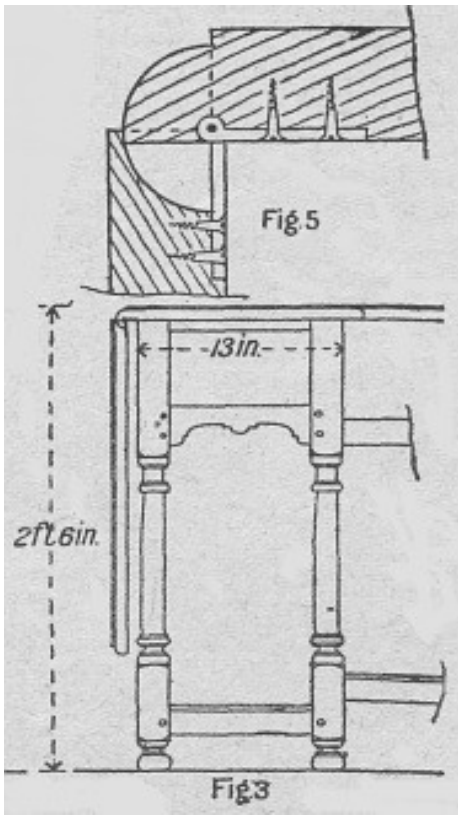
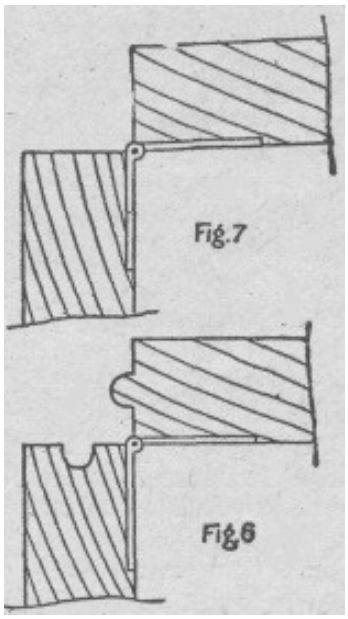
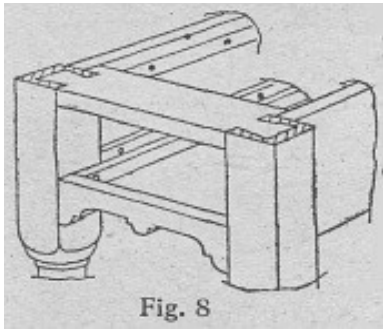


Fig. 3. Drawer end. Fig. 4. Above, Details of framework beneath table top.
Figs. 5, 6 and 7. Three methods of joining the hinging flaps.
Fig. 8. Detail of Fig. 3, showing drawer runners and kickers.



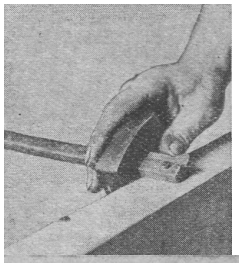


size or form, and generally called the standard. In a wider sense a gauge is a standard of comparison; consequently the word refers both to a gauging instrument, and to the accepted dimensions adopted as a standard.

As an example, take the Birmingham standard wire gauge, generally abbreviated to B.W.G. This is simply a recognized and accepted set of figures defining the diameter of wires, and is also used to define the thickness of some sheet metals. On the other hand, the Birmingham wire gauge is a measuring instrument in the form of a metal plate with holes drilled in it, corresponding in diameter to the standard dimensions of the B.W.G.

The steam gauge and water gauge on a steam boiler indicate in different manners the pressure of steam and the level of water respectively. A rain gauge measures the rainfall in inches of depth, the amount collected in the gauge in a given period being measured by pouring into a graduated glass.

The marking gauge used by carpenters for scribing lines upon a piece of work comprises a wooden bar and a stock made to slide upon the bar, and provided with a thumb screw or a wedge for fixing it. Near to one end the marking pin or scriber is fixed into the bar, and this is used for producing the marks on the work. In use the sliding part is fixed to the bar so that the distance from the face to the scribing pin is exactly the desired distance for the required marks from the working face of the wood. This tool is shown in Fig. 1. A mortise gauge has two independent adjustable scribers, and a cutting gauge has a movable chisel-like blade instead of a scriber.



Gauge. Fig. 1. Marking gauge used by carpenters for scribing lines upon wood.

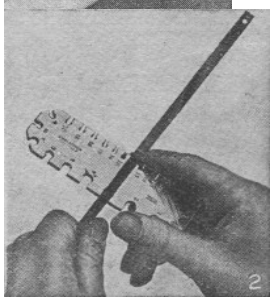
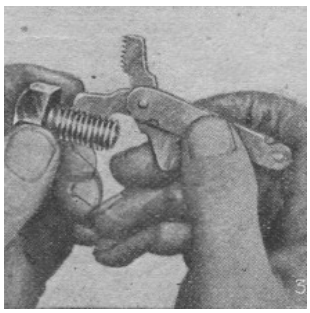


Fig. 2. Standard wire gauge shown measuring the thickness of a brass bar.



Right. Fig. 3. Screw thread gauge.

A wire gauge (Fig. 2) is a round or oblong plate of metal, preferably nickel-plated, to protect it from rusting. The edge is pierced with a number of slots which terminate in holes somewhat larger in diameter than the width of the slot. The gauging part is the space between the jaws, or the breadth of the slot. In gauging either a piece of sheet metal or a wire, the correct gauge size of the metal may be taken to be that corresponding with the number stamped against the slot into which the material just fits, if in doubt as to the proper size, it is as well to compare by testing with the gauge sizes next larger and smaller. Similar gauges, known as wire or plate gauges, are used for distinguishing metal up to about ¼ in. in thickness or diameter.

When using an instrument of this type it is important to ascertain the particular kind of gauge being employed, i.e. whether the Imperial standard wire gauge is being used, the Birmingham, or the Stubbs gauge. The Imperial gauge was legally established in 1884. The Birmingham and Stubbs gauges are both in extensive use, the Birmingham being employed chiefly for measuring iron sheets. The absolute dimensions vary with these different gauges. The gauge sizes commonly used are shown in decimals of an inch in the following table, arranged under the heading Birmingham, Imperial standard, and American wire gauges:

No.	B.W.G.	I.S.W.G.	American
16	·065 in.	·064 in.	·05 in.
20	·035 in.	·036 in.	·031 in.
22	·028 in.	·028 in.	·023 in.
24	·022 in.	·022 in.	·0201 in.

The full details can be obtained from any standard text book. As a rough and ready method it may be taken that No. 3 is equivalent to ¼ in.; No. 7, 3/16 in.; No. 11, ⅛ in.; No. 16, 1/16 in.; and No. 22, 1/32 in.

A standard twist drill and steel wire gauge is most useful, either in the plain type or giving the imperial standard wire gauge sizes. A combination gauge, showing the standard size of drills, the corresponding tapping size, and also the full thread or clearing size, is also used.

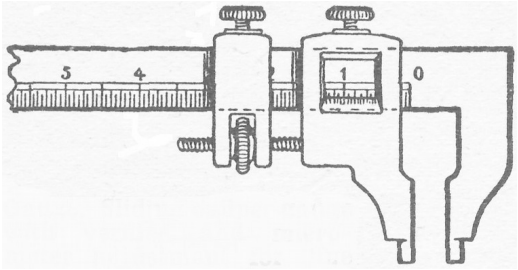
The screw thread or screw pitch gauge (Fig. 3) consists of a number of separate plates secured in a handle, somewhat like a pocket-knife, each separate jaw being fashioned to the correct shape and pitch of the screw thread corresponding with the number and size stamped upon it.

The feeler gauge is used to feel the distance between two objects relatively close together, such as the width of a slot. It has separate blades of hard steel of different thick-ness, marked with numbers, these being the number of 1 000ths of an inch of thickness. Such gauges are used by inserting a blade or blades into the slot to be measured.

By means of the depth gauge the depth of a hole can be readily ascertained. It has a central measuring rod supported by the stock. To use it, the rod is pushed to the bottom of the hole, and the end of the stock placed upon the outer surface or upon the place from which the depth is to be measured. Some forms have a micrometric adjustment.

Another useful gauge for the amateur mechanic is a sliding caliper. This is made of steel, 6 in. to 10 in. long, the stock being graduated usually in both English and metric measures. One jaw is part of the stock; the other slides along the stock and is fixed by a set screw. A vernier incorporated in the slide enables readings to be taken down to 1/128 in. and 1/10 mm. respectively.

The jaws are adapted both for inside and outside measure-ments. *See* Cutting Gauge; Calipers; Wire.



Gauge. Sliding caliper gauge with vernier, and micrometer adjustment for fine measurements.

GAUGED STUFF. This term is used in plastering work for coarse or fine stuff which has had plaster of Paris mixed with it, thus shortening the period required for setting. One part of plaster of Paris to four parts of coarse or fine stuff may be used, up to equal proportions according to the rapidity with which the material is required to set, and also the strength. For heavy cornices the proportions should not be less than one to three. *See* Coarse Stuff; Fine Stuff; Plastering.

Gaultheria. *See* Winter Green.

GAUZE: The Fabric. Although the term is applied loosely to light silks and cottons of open texture, gauze has a special meaning founded upon the method by which the fabric is woven. In true gauze the threads are locked in position by being brought round one another. This principle is employed in goods not sold under the name of gauze, e.g. in many Madras curtains, in cellular cloth for underwear, and, partially, in leno fabrics.

In fancy dress, gauze is frequently used to form wings for fairy costumes. Wire gauze, as used for meat-safes and for window shields, is wire woven upon a loom.

Use in Surgery. Gauze is extensively employed as a surgical dressing to absorb discharges, or narrow strips may be introduced into a wound to act as a drain, or wounds or cavities may be plugged with it for the arrest of haemorrhage. Gauzes impregnated with some chemical antiseptic have distinctive colours. Thus boracic gauze is pink; cyanide of potassium, mauve, etc. *See* Dressing.

GAZANIA. This flowering plant, which is unfortunately not hardy in most gardens, makes a gorgeous show in summer in well-drained soil in a sunny position. Gazania splendens is the favourite kind; its orange-coloured flowers with dark central ring are 2 to 3 inches across. Propagation is by cuttings inserted in sandy soil in a frame in August; it is unwise to plant the rooted cuttings out of doors until May. Pron. Ga-zā-ni-a.

GEAR: Spur and Bevel. Gearing as a means of transmitting power from its source to a given point is carried out in its commonest form by the spur tooth wheel, of which there are two forms, the involute and the stub. The former is used almost exclusively in Great Britain, while the latter is most favoured by the American engineer. Both types have their technical advantages.

With any form of tooth gearing the drive is positive; therefore, if a wheel of, say, 48 teeth is in mesh with one of 12 teeth, their difference in speed will always be 4 to 1. This means an increase or decrease of the power transmitted according to which wheel is acting as the driver. Should the large wheel be the driver, then the small wheel would only transmit one-quarter of the power expended to drive it. Conversely, if the small wheel is the driver, then the large wheel will transmit four times the power expended to drive it.

By a suitable combination of gears enormous power can be obtained at the sacrifice of speed of the driven end of the train of gears, or a very high speed can be obtained at the driven end at a sacrifice of the power expended. This will be better understood by a reference to Figs. 1 and 2. Two examples in everyday use are the mangle and lawn mower, shown at Figs. 3 and 4.

On referring to Fig. 3, it will be seen that a train of six gears is employed by which to obtain the necessary power called for at the rollers, and operates as follows: The drive commences via the fly wheel through *a* to *b,* thence through *c* to *d,* and then through *e* to *g.* The cog wheel *a*, that is a part of the fly wheel, rotates independently on the extension of the shaft of the bottom roller, shown dotted. The cog wheels *c* and *b* are in one piece, and rotate on the pin *h*. The cog wheels *d* and *e* are also in one piece, and rotate solid with the bottom roller.

A combination on a similar principle is employed for the screw-cutting train of gears on a lathe. The driver is always moun-ted on the end of the man-drel, and the last gear wheel in the train is moun-ted on the end of the lead screw. By varying the combination any desired screw pitch may be cut. Fig. 4 shows the method by which the side wheel type of lawn-mower cutters are driven.

A few of the commonest uses of the spur gear may be mentioned. The change wheels of a screw-cutting lathe; all types of printing machinery and factory machinery; the timing-gear of the internal combustion engine; gear boxes; clocks and watches. In all cases where power is to be transmitted in the same plane the spur gear can be employed.

Two other forms of square-faced gear are the skew or helical gear and the double helical. With the former the angle of the teeth is in one direction only, and, through the medium of the sliding engagement, greater silence in operation is attained, but owing to the side thrust that is created by the tooth angle, an additional thrust bearing must be provided for each wheel employed. Fig. 5 illustrates the skew or helical gear.

The double helical type of gear (Fig. 6) is, next to

worm gearing, probably the most silent gear there is, and with this type, owing to the V-formation of the teeth no side thrust takes place. Where a drive has to turn a corner a bevel or worm gear is employed, and with it the angle of the turn need not be a right angle. The bevel gear is used extensively for machinery and bench drills; one notable application of it is the mechanic's breast drill. As with the spur gear, the bevel gear is also constructed with the teeth set at an angle from the centre of the wheel and known as the helical or skew gear, and double helical gear. Both types are used as the drive for the live axle of a motor car.

The worm gear is invariably employed for a true right-angle drive. The percentage of efficiency is not as high as that of the spur and bevel gears, owing to the large area of sliding contact between the faces of the worm and teeth, but worm gear has the merit of extreme silence in operation. Other forms of gear drive are chain drive, the round, the V and flat section forms of belt transmission, and electric and fluid types.

Of chain gearing probably that of the ordinary pedal bicycle is the most common type in use. It may be noted that with this form the gear ratio is not worked out on quite the same principle as with the other forms of gear, the formula being as follows: Number of teeth on chain wheel multiplied by the diameter in inches of the back wheel, and divided by the number of teeth in the hub chain ring.

The proper functioning of all forms of gearing will depend in a large measure upon the correct meshing of the teeth. One of the worst evils to be avoided is bottoming of the teeth, i.e. the tops of the teeth must not come in contact with the base of the engaging teeth. *See* Bevel Gear, Bicycle. Chain, Clock; Coaster Hub, Differential Gear, Drill; Three-Speed Gear.

GEARS FOR MOTOR VEHICLES

Types of Change Speed Gear in Common Use To-day

For further information on this important piece of mechanism consult the articles Bicycle; Differential Gear; Three-Speed Gear. See also Live Axle; Motor Car; Motor Cycle.

As understood for motor cars, gear provides up to four forward speeds and one reverse speed. A simple type of three-speed gear is shown in Fig. 1. The four smaller diagrams show the positions of the gear teeth for each speed. The gear shafts are arranged to run in the same plane as the engine, and connected to the clutch and the cardan shaft by means of universal joints. With this arrangement the torque, or drive from the engine, is direct through the gear shaft to the gear wheel.

An example of a four-speed gear box is shown in Fig. 2. The first and second speeds are obtained by a pair of sliding, straight-toothed gear wheels; while, for the third and fourth speeds, dog clutches are used to bring into operation permanently meshed gears of helical tooth formation. The helical gear wheels *a* and *b* on the ends of the countershaft are in permanent mesh respectively with the wheels *c* and *d*, the former being driven from the engine and the latter running freely on the driven shaft *e*. The sleeve *f* is splined to the driven shaft *e* and, when it is moved to the left, teeth *g* at one end engage corresponding clutch teeth on the side of the gear wheel *c* and give the direct drive or fourth speed. When the sleeve is moved to the right, teeth *h* at the other end engage corresponding internal clutch teeth on the gear wheel *d*, giving the third indirect speed.

The first and second speeds are obtained by sliding the pair of gear wheels, *j*, *k* into mesh with the gear wheels *l*, *m* on the countershaft. The wheels *j*, *k* are splined on the outside of the sleeve *f*. The wheels *j*, *k* and sleeve *f* thus always rotate with the driven shaft *e*. Frequently a "synchro-mesh" arrangement is embodied in the dogs so that the latter are synchronized at the moment of changing gear, thus giving a smooth, silent change.

Epicyclic Gears. This type of gear is employed in the transmission system of a few cars, but its chief use lies with the pedal bicycle.

In the epicyclic gear all the pinions are in constant engagement. The mode of operation may be easily understood with the aid of Fig. 3; *a* is a metal ring which carries internal teeth around its periphery; *b* is an ordinary spur-toothed cogwheel keyed to the engine shaft, whilst *c* is a cogwheel, the diameter of which is such as to allow of its engagement with the internal teeth on the ring *a* as well as its engagement with the pinion *b*. The arm, *d*, acts as the bearing for *c*, and is capable of rotating independently of the crankshaft, *f*, from which it takes its support. To obtain the high gear, *a*, *c* and *b* are locked solid by a suitable means, which causes the whole mass of wheels to rotate as solid with the crankshaft, the arm *d* being the driving medium to the transmission.

The second speed is obtained by locking *a*, by means of the band, *e*, and allowing pinion, *c*, with the arm, *d*, free movement; by so doing pinion, *c*, which is being rotated in the opposite direction to the crankshaft pinion, *b*, is through the medium of the stationary ring, *a*, being forced to move slowly with the arm, *d*, in the same direction as the crankshaft pinion, *b*, the arm, *d*, being suitably connected to the transmission, thereby giving the low gear (A, Fig. 3). To obtain the reverse the arm, *d*, is secured stationary, i.e. temporarily disconnected from the transmission, and the ring, *a*, allowed free movement. By so doing the crankshaft pinion, *b*, which operates the pinion, *c*, in a reverse direction, obviously causes the pinion, *c*, to rotate the ring, *a*, on the inner side of which it engages, in the same direction as itself, the ring, *a*, in this case being the driving medium to the transmission. The position of the gears is shown at B (Fig. 3).

A neutral position is obtained by allowing the gear to run free, i.e. the outer ring; *a*, is running free and being driven by the pinion, *c*, which in turn is driven

(See next page for diagrams, continued in page 953)

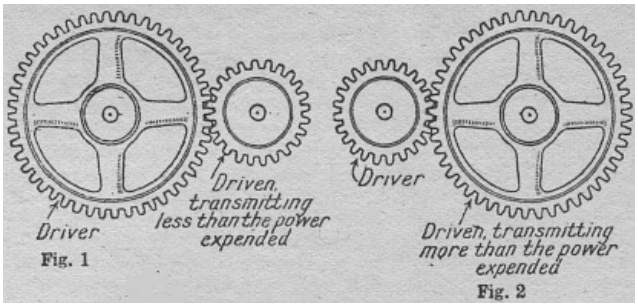


Fig. 1 Fig. 2

Various types of spur and bevel gear in common use. Fig. 1. Large driving wheel, small driven wheel. Fig. 2. Small driving wheel, large driven wheel. Fig. 3. Gears of a mangle. Fig. 4. Lawn mower gear. Fig. 5. Single helical gear. Fig. 6. Double helical gear.

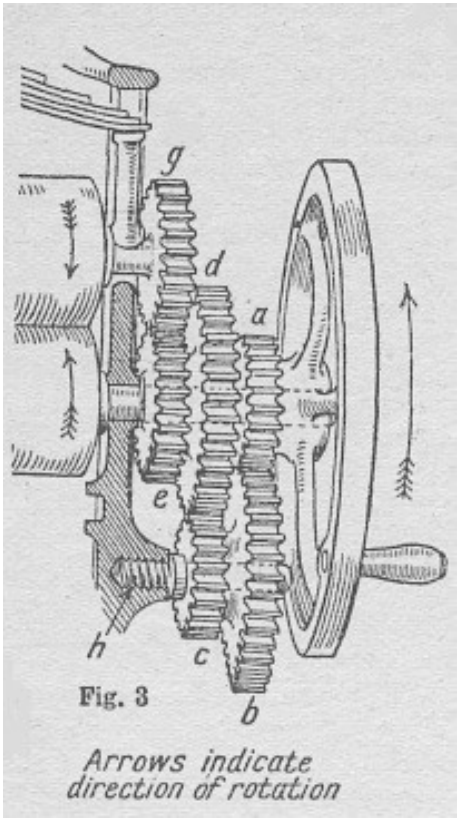


Fig. 3

GEARS

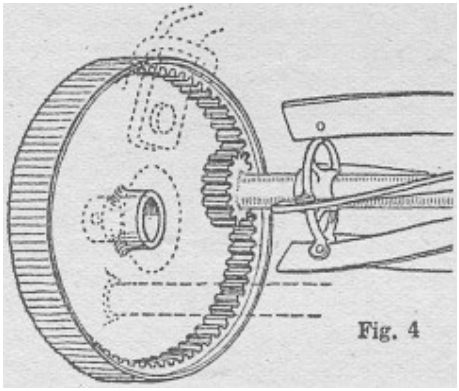


Fig. 4

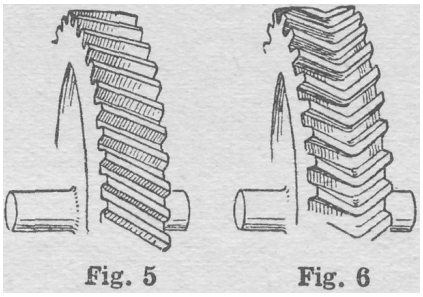
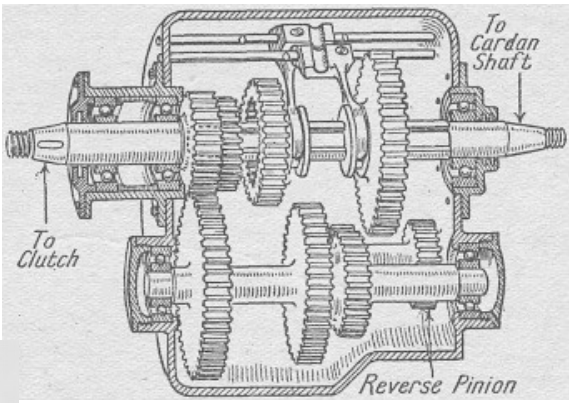
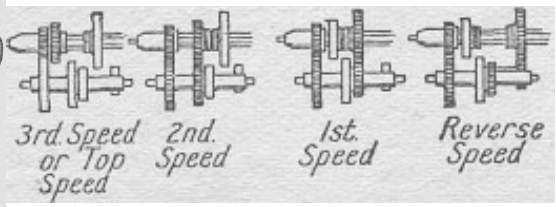


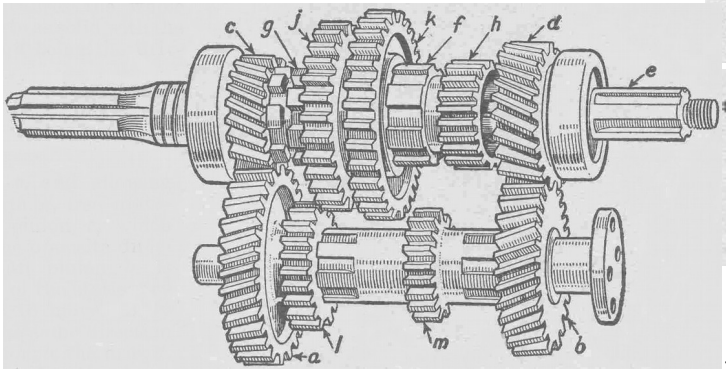
Fig. 5 Fig. 6

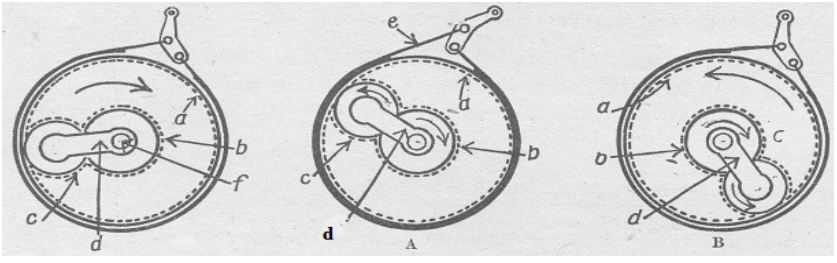




Above. Fig. 1. Three-speed car type gear box, showing engagement of teeth on the three forward gears and reverse.

Below. Fig. 2. Diagram showing arrangement of gears in a four-speed gear box.





Left. Fig. 3. Diagrams illustrating the principle on which the epicyclic gear is worked.

by the crankshaft pinion, *b*, so it follows that unless the outer ring, *a*, is locked by means of the band, *e*, the driving arm, *d*, will remain at rest.

A somewhat different design of epicyclic gear is used in conjunction with the preselector or self-changing principle of operation. The actual changes of gear are effected by the depression of a clutch pedal, but, prior to the operation of the pedal, a small hand lever mounted on the steering column below the hand wheel is moved to select the appropriate gear. In a typical system there are four epicyclic trains of gear, giving four forward speeds and one reverse. By adjusting the hand lever any gear may be pre-selected, to be engaged when desired by first depressing and then releasing the clutch pedal.

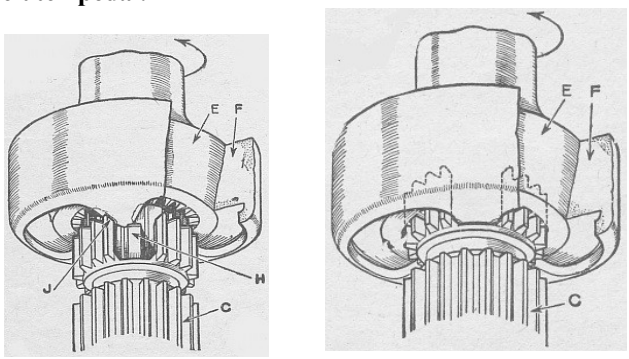


Fig. 4. Cone clutch, dogs and splines incorporated in the synchro-mesh mechanism. (Courtesy of "The Autocar")

A synchro-mesh mechanism embodying a cone clutch is shown in Fig. 4. The function of the cone clutch is to synchronise the two rotating parts so that when the teeth come together they are moving at the same speed and the engagement is effected without noise or shock. The principle of the gear-box is not therefore affected—as it is in the self-changing gear, for instance—but the movement of the gears is controlled so that engagement is always preceded by the synchronisation through cone clutches. The most accurate way of regarding the synchro-mesh principle
is that of introduction.

The driving shaft of the gear is of normal design, as is the driven shaft. The driven shaft is splined and held at one end in a ball bearing, and at the other in a roller spigot bearing. On the driving shaft is to be found the ordinary gear wheel which meshes with a wheel on the layshaft, and on the driven shaft there is the gear wheel which picks up the drive from the layshaft. In the middle of the driven shaft is a sleeve *c*, fitting into the splines on the shaft and itself splined on the outside, as shown in the diagrams above.

The synchro-mesh mechanism consists in a cone *e*, which is machined on the side of the ordinary gear wheel on the driving shaft. Within the cone is a ring of internal teeth. On the driven shaft is a coned ring, *f*, which projects over the cone *e*, on the driving shaft in exactly the same way as the female member of a cone clutch projects over the male member. When the driver moves the gear lever to top gear a sleeve on the driven shaft is moved up and brings a number of springs, *h*, against the back of the cone. These springs move the ring up to engage with the cone, the engagement being progressively closed. Synchronisation is thus secured, and a further movement of the gear lever brings into operation the edge *j* of the sleeve, and the resulting pressure forces the clutch hard home and the sleeve splines into the internal teeth of the cone.

So long as the speed of the ring differs from that of the cone the gears cannot be engaged.

Generally speaking, change speed gearing requires little attention beyond keeping the oil at the correct level. All modern gearboxes, like live axle casings, are provided with special filler openings, which are so arranged that the gear box is easily filled to the proper level but cannot be over-filled, since any surplus would overflow from the opening. The filler opening is so placed that the oil is approximately level with the axis of the countershaft. In cold weather, when the oil is thick, the motorist may prefer to fill the gear box from the top, but the plug of the filler opening must then be removed to ensure that the gear box is not over-filled.

An excess of oil may in some cases be a source of much trouble, since it may leak on the one hand into the clutch casing, or may overflow into the torque tube and raise the level in the axle casing to such an extent that oil may leak on to the brake drums.

Most makers advise that the gear box on a new car should be emptied after the first 500 miles, preferably when the car comes in from a run and the oil is therefore warm and liquid. A plug is always provided at the lowest point of the box for this purpose. After the oil has drained out the plug should be re-inserted and the gear box flushed thoroughly with paraffin, or better still with a special thin flushing oil.

GELATINE: The Substance. When bones, ligaments, and other connective tissues of animal bodies are boiled in water, a colourless and odourless solution is obtained, and if this is evaporated to dryness, gelatine remains in translucent shreds of a pale yellow colour. When dissolved in warm water and allowed to cool, the liquid is converted into a jelly.

In surgery, gelatine may be used to check bleeding. As a food, gelatine has a certain value in that it can partly replace the proteins, lean meat, egg white, gluten, etc., which are required to replace what is lost in the wear and tear of the body. Gelatine is much used by manufacturing chemists for making capsules, pastilles, and other articles. *See* Demulcent.

GELATINE: Use in Cookery. Of the various kinds, sheet or leaf gelatine is the best. It is made in thin, transparent sheets, and will dissolve quickly in water, ¾-1 oz. being needed for every pint of liquid. Packet gelatine is opaque and yellowish. Of this 1 oz. will stiffen 1½-2 pints of water, but it may need soaking for 6 hours.

A third kind, opaque gelatine, is chiefly used for

strengthening stocks and soups. Of this ½ oz. dissolved in ½ pint of water, with a teaspoonful of meat extract added, makes a good glaze for a tongue, etc. Powdered gelatine is also greatly used, and is very successful. *See* Glaze; Jelly.

GENERAL POST. The name of this game has become proverbial for a complete change round of persons or things. The game can be played by any number of people.

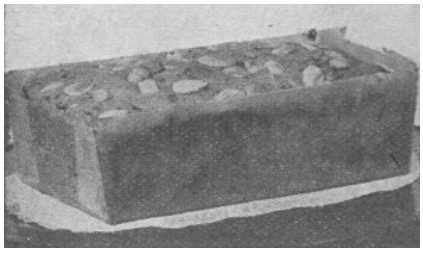
Each player chooses the name of a town, which should be written down by the person who acts as postmaster. One is then blindfolded and stands in the middle, while the others sit down in a circle. The postmaster reads out the names of two of the towns, as, for example: "The post is going from London to Exeter"; or from Liverpool to Edinburgh, etc., and the persons representing those towns have to exchange places, while the blindfolded man tries to catch one.

The blind man continues in the middle until he has caught somebody, though the post may pass successfully many times before he does so. The postmaster should vary the changes as much as possible, sometimes choosing two people at opposite sides of the room, sometimes two who are next to each other. At the words general post all the players have to change their places. A variant of the game is for a player, not blindfolded, to try to gain the place of one of the two persons exchanging seats.

GENERATOR. The object of the various kinds of generators is to convert one form of energy into another. As an example, the acetylene generator comprises a vessel containing calcium carbide, another to hold water, and a third to receive the gas, which is generated by the drip of the water on the carbide.

An electrical generator is an apparatus for converting mechanical into electrical energy. The name is generally used in electrical work for a particular type of machine, the alternating current generator; but from the domestic point of view it may be applied also to dynamos generating a continuous current. Occasionally the term generator is applied to a boiler which generates steam, particularly the type known as the flash boiler. *See* Acetylene; Dynamo.

GENOA CAKE. To make this cake, wash ¼ lb. sultanas and 2 oz. currants, drain them thoroughly and leave them to dry. Beat ½ lb. butter or margarine to a cream with 6 oz. granulated sugar, then add 3 eggs, one by one, beating each in well before adding the next. Stir the mixture for 5 min.



Genoa Cake, deco-rated with almonds, and wrapped in greased paper as removed from baking tin.

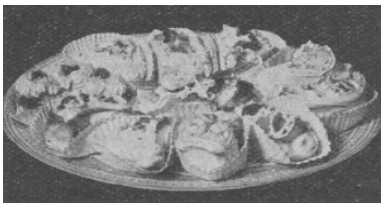
Mix together the currants, sultanas, 2 oz. glacé cherries, the same quantity of mixed peel, and ½ oz. blanched and chopped almonds; then sieve ¾ lb. flour, measure out 1 tablespoonful, and mix this quantity with 1½ teaspoonfuls baking powder. The remainder of the flour, mixed with the grated rind of a lemon, must be folded alternately with the fruit into the butter, etc.

Stir all together lightly, add a little milk, if necessary, and then stir in the baking powder. Put the whole into a greased cake-tin lined with greased paper and bake it in a moderately hot oven for about 1¼ hours, lessening the heat after the first 20 min. The top of the cake may be decorated with a few blanched and chopped almonds at the same time as the heat is reduced.

GENOESE PASTRY. Made either white or coloured, this pastry forms the foundation of many small fancy cakes. To make it, whisk 3 eggs and 4 oz. castor sugar in a basin placed over a pan of hot water until the mixture becomes thick and free from streaks. This should take about 10 min.

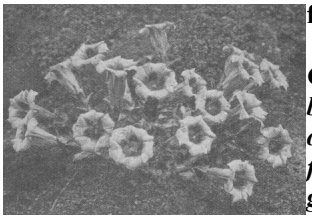
Put the basin on the table, continue whisking for a few minutes, and then stir in by degrees 3 oz. Vienna flour and the same quantity of butter. Add the flavouring, then turn the mixture into a shallow baking-tin lined with greased paper, and bake it in a hot oven until it is firm and lightly browned.

Genoese Biscuits. To make these, cut some Genoese pastry into crescents and other small fancy shapes, coat them with royal icing, and then leave them in a cool oven until the icing becomes of a pale biscuit tint. When cold the biscuits should be decorated with a few pieces of glace cherries or angelica, and, if liked, a little more icing. *See* Biscuit; Icing.



Genoese Biscuits. Small fancy cakes suitable for the afternoon tea table.

GENTIAN. Most of these dwarf Alpine plants are suitable for the rock garden, and some of them thrive in the mixed border. The drug gentian is obtained from the root of G. lutea, with yellow, spotted flowers in July; height up to 4 ft. The interior of the root, like the flower, is yellow.



Gentian. The beautiful blue trumpet-shaped flowers of Gentiana acaulis, a favourite plant for the rock garden.

Gentiana acaulis is a most beautiful but capricious plant, which frequently will not thrive under conditions which might be expected to favour it. It likes well-drained stony loam, a sunny place, and must be

watered freely in early summer. The blue flowers are large and tubular, and are borne on very short stems.

Gentiana verna is a lovely miniature kind for the rock garden; it is most likely to flourish in gritty loamy soil in a sunny place, and needs an abundance of water in early summer. Decumbens and septemfida are two other beautiful gentians which thrive in deep sandy loamy soil if kept moist in spring and early summer. Sino-ornata is splendid and easily grown in leaf mould.

Andrewsii, 18 in. high, and asclepiadea, 2 ft. high, are more vigorous plants suitable for well-drained loamy soil in partial shade. Lutea is a distinctive plant with large leaves and stems 2 to 3 ft. high, bearing whorls of yellow flowers in summer; this thrives in ordinary loamy soil.

Many gentians are unreliable and shortlived under cultivation, and it is usual to raise them from seeds every few years in order to maintain a healthy stock. It is advisable to sow the seeds as soon as they are ripe in pots of gritty soil, and to expose the pots to snow and frost in winter; this practice will be found useful in order to quicken germination of the seeds in spring.

Uses of the Drug. The drug is obtained from the root of the yellow gentian, found in Europe and America. Its chief characteristic is its extremely bitter taste, and it is largely used in bitter tonics and digestive mixtures. Its action is closely similar to that of calumba (q.v.) The doses of the different preparations are: extract of gentian, 2-8 gr.; compound infusion of gentian, ½-1 fluid oz.; compound tincture of gentian, ½-1 fluid dram. *See* Border; Rock Garden. Pron. Jen-shan.

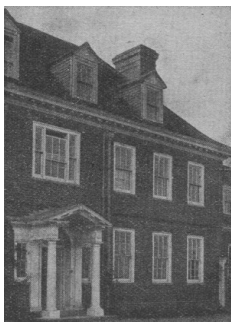
GEORGETTE. Crêpe georgette was the name originally of a silk made from very tightly twisted raw silk both in warp and weft. The surface is crêpe-like and lustreless, crisp and hard to the touch. The goods are self-coloured and dyed in all shades. Though thin and semi-transparent, in good qualities, georgettes are excellent silks for wear. When re-dyeing, allowance has to be made for the hardness, and extra time allowed for penetration. Cotton georgette is a good cotton crêpe, which washes well and does not always require ironing.

Georgette garments are inclined to shrink during the wash, and almost invariably do so when dyed. It is usually possible, however, to pull them into the original shape during the ironing process when the fabric is still damp.

GEORGIAN STYLE. This term refers to styles in architecture and furnishing which flourished in the period covered by the reigns of the four Georges, i.e. from 1714 to 1830. The term neo-Georgian is sometimes used for styles designed during the reign of George V.

The Georgian style proper was essentially a vernacular one as opposed to the more formal variation of Renaissance architecture applied to public buildings and the mansions of the great. It is also the basis of a great part of our garden suburb building.

The old Georgian style can be studied best in certain residential terraces of London. Westminster and Bloomsbury are full of examples of the earlier and later Georgian houses. It is peculiarly adapted to the terrace house, Smith Square, Westminster, Bedford Row, Holborn, Cheyne Row, Chelsea, and Church Row, Hampstead, may be cited as examples of treatment in which the Georgian architect delighted. Red brick, with or without stone dressings, was almost universally employed, and the dark rich tone of this is one of the most attractive features of these old houses.



Georgian style. Exterior of an 18th century red brick house by Sir Robert Lorimer. This style is distinguished for its simplicity, dignity and repose. (Courtesy of Country Life)

The roofs are invariably hipped, i.e. they slope upward and backward from the walls on all four sides. They were not brought down to form overhanging eaves, but were stopped behind the walls, and there was often a low brick parapet or a pediment on the front of the house At the beginning of the 18th century the division between roof and walls was generally a heavy wooden cornice. This disappears in the Georgian house, a red brick moulded cornice being substituted a little below the parapet. The roof was often pierced with dormer windows, as shown in the first illustration. At first the roofing material was red tiles, but these afterwards gave way to slates, especially on town or city houses.

Our fine example shows that the central feature of the facade was the doorway. This was generally of wood in the earlier examples, stone being employed later, and was often covered as seen here by a fine hood and supported on either side by classical columns or pilasters with their correct entablature. Porches were rarely used.

In these houses a great deal of inventive talent was lavished on the hood and the doorway generally, the intention being to contrast this feature so rich in detail with the sedateness of the rest of the front. A fairly substantial string course marked the storeys of the house and separated the rows of windows from each other.

The windows were always of the sash variety, tall and narrow, with wide frames flush with the brickwork, the sashes themselves being divided by glazing bars into several rectangular frames. The frames were painted white. It was usual particularly in twin or terrace houses to build a basement storey, the entrance floor being raised a little above the ground level. Hence there was the opportunity of a flight of stone steps up to the front door, and these steps were often, in the more pretentious mansions, extended in a sweeping curve on either side as they approached the pavement.

Interior Decoration. Throughout this century the tendency was towards lighter construction, inside and outside. Just as the glazing bars of the tall window became less solid, so the constructive decoration of the interior grew less massive.

The Georgian staircase, for instance, is easily distinguishable from its predecessor The string or support of the stairway was stepped so as to show the end of each stair, instead of being, as formerly, a long, solid entablature. This expressed the main idea of the Georgian staircase makers, that the stairway was a continuous series of steps from floor to floor. Pedestals at the foot of the stairway, which in Jacobean architecture were heavily carved, became little more important than the balusters. The handrail was thinner.

Chimney-pieces grew altogether lighter in construction, until they culminated in the daintiness of the Adam period. Panelled walls continued as the basis of the decoration, but the panels were simpler and shallower, and were often in carved pine or were painted in white or cream. It is noteworthy that the same panelling was used throughout the house. The only assertive decorations were the ceiling cornices and the superstructures to overmantels, doors and windows. Wrought-iron work was very largely used, and this ministered to the craving, for light construction. Necessarily there are to be found in some purely Georgian houses Queen Anne and even Jacob-ean features, but overlapping is inevitable in any architectural period, and the Georgian atmosphere is less mistakable than most.

Our second illustration shows a mid-Georgian drawing room with richly ornamented ceiling and broken pediments crowning the larger door and the chimney-piece. The panels are simple in well designed contrast to the cornice decorated with dentils and classical motives. The furniture is of the Chippendale period with side tables enriched with fretted ornament and chairs with pierced splats of carved ribbon patterns. The writing table is an example of the French taste then in vogue with its delicate ormolu decoration. The Georgian dog grate, serpentine fender and Oriental hearthrug are furnishing points of interest.

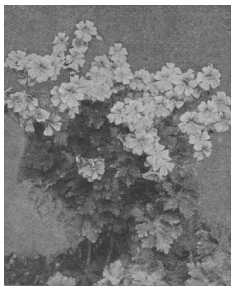


Georgian Style. Mid-Georgian drawing room with characteristic panelled walls, richly ornamented ceiling and pediments over the door and chimney-piece. The furniture is of the Chippendale period. (Courtesy of Country Life)

An important development in connexion with Georgian interior decoration was the use of wallpapers. Several factories in London after the first half of the 18th century produced printed and coloured papers in Chinese designs, and as the classical styles became the vogue with the work of the Adam brothers and continued till the end of the Georgian period, designs introducing classical landscapes with temples and statues were popular.

Modern adapters of the style sometimes dispense with some of its most beautiful details. One does not often see a neo-Georgian house with a parapet or a pediment. There is a preference for over-hanging eaves, and only a few modern houses can carry the tall windows of the old-time terrace house. A profusion of artistic wrought-iron work is financially impossible in most cases. But the vitality of the style is proved by deviations that may be made in details without the sacrifice of its general content. *See* Adam Style; Bedroom; Chippendale Style; Fireplace; Furniture; Glass; Hepplewhite Style; Regency Style; Sheraton Style; Silver.

GERANIUM. The true geraniums are hardy perennials suitable for the flower border and the rock garden. The zonal pelargonium, a popular flower for summer bedding, and commonly though erroneously called geranium, is a tender South American plant which does not withstand the winter in this country. It is described under pelargonium (q.v.).



Geranium grandiflorum, a hardy plant with violet-blue flowers in summer. See below.

The hardy geraniums suitable for the flower border flourish in ordinary soil and are increased by division in autumn or spring and by seeds sown in boxes of soil in a frame in April. All are summer-flowering. The best of the vigorous border kinds are armenum, 2½ ft., crimson purple; Endressi, 15 in., rose pink; grandiflorum, 12-15 in., violet-blue; and ibericum, 18-24 in., violet-blue.

Geranium argenteum, 4 in., grey leaves and rose-coloured flowers; cinereum 4 in., grey leaves and pink flowers; and lancastriense, 3 in., rose colour, are suitable for the rock garden where they thrive in sunny places and well drained sandy soil. Geranium pratense is the common crowfoot which grows wild in Britain.

GERBERA. This beautiful summer-flowering perennial from South Africa, commonly known as the Transvaal daisy or gerbera, rarely succeeds out of doors in Britain, unless grown in a well drained sandy soil in a warm sheltered position. It belongs to the daisy order and bears very showy flowers, carried singly on stout stems about 1 ft. long; in the newest varieties the flowers are of various shades of red, orange red, salmon, and rose. The typical kind is Gerbera

Jamesonii, with bright red or scarlet flowers.

The best way to grow the Transvaal daisy is to plant in a sunny border at the foot of a heated greenhouse or in a bed of soil in a sunny frame: it may also be grown in pots under glass. A compost of loam, leaf-mould and sand is suitable. Propagation is by division of the plants in spring or by seeds sown under glass in March.

GERMAN MEASLES. The symptoms of German measles, also known as rubella, resembles those of measles, but the disease is much less contagious. The microbe has not been discovered. The incubation period is about 14 days. The infection probably spreads from person to person on the breath, skin scales, and clothing.

An attack may be ushered in by feeling of chilliness, running of the nose, sore throat, headache, pains in the back and legs, and some feverishness. The glands of the neck generally swell a little, and a red eruption may be seen in the throat. On the first or second day a pinkish-red rash appears on the face and neck, and then spreads down over the body. It lasts from three to five days as a rule. The neck glands remain enlarged, and occasionally those of the armpits and groin become a little swollen.

It is best to put the patient to bed and keep him there until the rash fades. Give him light, digestible food, and if there is any constipation give a mild aperient such as half teaspoonful of confection of senna.

Keep the patient from mixing with other children for 8 or 10 days after the appearance of the rash, and until all catarrhal symptoms in the nose and throat have disappeared. Children who have been exposed to infection should be in quarantine for 20 days. *See* Infectious Diseases; Notification; Measles.

GERMAN SILVER. German silver is known under several different names, among which are nickel silver, Nevada silver, electrum, and others. It is an alloy of copper, nickel, and zinc, the composition varying. The best quality is composed of two parts of copper, one of nickel, and one of zinc. This grade is more difficult to work but possesses a fine polishing surface, and is used to imitate real silver.

The metal can be easily worked, rolled, hammered or drawn; ease of working depends upon the proportions of the alloy, a higher percentage of copper generally making it softer. While fairly hard, tough, and not easily corroded, it becomes slightly tarnished if long exposed to the air. It can easily be soldered. *See* Metal Work; Soldering.

GERMAN WHIST. This variety of ordinary whist is played by two persons. The players cut for deal, the lower cut being the winner. Here the ace counts as the lowest card. The winner of the cut then deals out alternately 13 cards to himself and 13 to his opponent. He turns up the next card to show what are trumps and leaves the rest of the pack on the table.

The player who has not dealt then leads, and play is as at whist. Players must follow suit if they can; if not, they can play a trump card, which is superior to those in all other suits. The winner of the first trick takes the exposed card into his hand and the loser takes the next from the pack. They repeat this after every trick, and so have always 13 cards in hand until the pack is exhausted. When the thirteenth trick has been made the winner leads one of the cards in his hand and play continues until all have been played out, trumps being as before. The tricks won by each player are then counted.

GESSO WORK IN VARIOUS FORMS

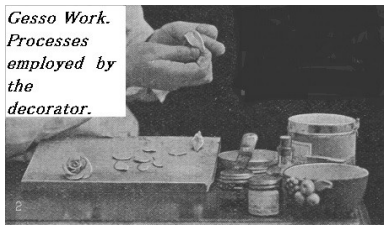
Modern Uses for this Decorative Handicraft

For related information consult the articles on Italian Renaissance Work; Lacquer Work; Leather Work and Stencilling. See also other ornamental crafts, including Lampshades; Pattern Printing, etc.

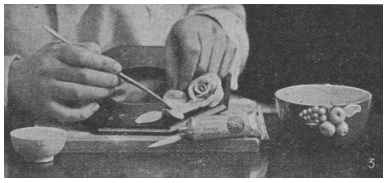
Gesso is a form of applied decoration. The material that is employed consists of a pasty substance compounded chiefly of plaster of Paris and glue. It was used for ornament in relief, and is found frequently on the frames of Queen Anne mirrors, on chairs, and other furniture of that period. The woodwork was overlaid with gesso in a decorative design and then gilded, which produced the ornate character of the gilt furniture of the late 17th and early 18th centuries.



1. Roiling paste in the hands to form a ball.



2. Shaping the leaves or petals.



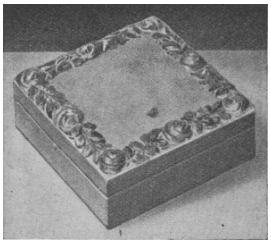
3. Using the modeller to make veins in leaves or for other delicate work.

When used for high relief gesso powder is unsatisfactory in wear, and for such work barbola paste has taken its place, as it can be easily modelled owing to its plastic nature, and when dry it is quite hard. The box illustrated in Fig. 4 is an example of modern gesso work in low relief; the mirror frame and bowl, Figs. 6 and 7, are ornamented in barbola work. The latter is particularly effective when used for decorating painted and gilded cane furniture. The former is the foundation paste for slightly raised lacquer work designs.

The wooden box for handkerchiefs (Fig. 4) is first rubbed down with sandpaper and then painted white before being coloured the desired shade with transparent lacquer. When this is quite dry make a tracing of the size of the top of the box, and design something suitable. Conventional work of the type shown is the most effective. Trace this on to the box by turning the pencil side on to the wood and going over the back with a fairly hard pencil; but should the design be incorrect when reversed, go over the back of the design with an H.B. pencil, lay this side next the wood, and trace off with a harder pencil, it is better to make the design on tracing paper, as if much is rubbed out on the box it becomes greasy and the colours work badly. The border of a conventional floral embroidery design can be well adapted from a transfer on to tracing paper.

Mix some gesso powder into a creamy paste with water. Apply this to the design with a brush and avoid going over the edge. Care is necessary, as the gesso paste should be modelled a little and applied in the direction it is to lie. Each leaf should be modelled separately and the roses worked in a circular direction. Several coats of gesso may be used, but not very thickly, as it looks rough when dry. Any unevenness can be rubbed down gently with sandpaper.

When the gesso is quite hard it can be coloured with barbola colours. Allow these to dry and then varnish with Barbola varnish. Articles can be obtained with the raised work on them and are then easily finished in colours. The real fascination of the work, however, lies in the modelling.



Gesso. Fig. 4. Handkerchief box, with border of leaves and flowers.

Barbola Decoration. Experimental outfits for barbola work can be obtained for 3s. 6d. Varnish, paste, gesso powder, tubes of colours, bronze powders, brushes and tools can all be obtained as required in a good art department. Barbola can be applied in many ways, one of the most effective being for mirrors. Procure a wooden mirror-frame, sandpaper it, then coat it over with quick drying lacquer or stain. Select a suitable design to trace or copy.

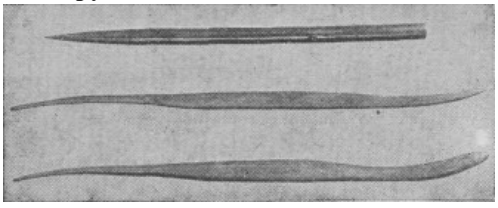
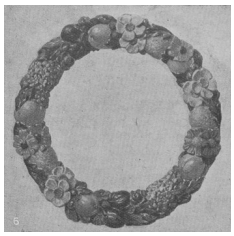


Fig. 5. Tools used for delicate modelling in Gesso work.

Model groups of fruit or flowers, using barbola paste, and stick them to the wood, using a paste made from the barbola to which water and a little powdered glue have been added. It is important to allow the modelled work to become absolutely dry and hard before attempting to paint it.



Gesso. Fig. 6. Coloured table wreath or mirror frame.

In modelling use a little gesso powder on the hands, as the paste will work more easily and will not show the marks of the skin. Avoid labouring the work. Take out the amount of paste required and roll it in the hands, Fig. 1. Should it be desired to form an apple or similar fruit, roll it into a ball, and when the correct shape has been obtained put it on a piece of glass or board, and finish off with a barbola modelling tool, Fig. 5. Avoid handling too much. Press in the top to make the eye and round the sides. Then turn carefully and round the other end, and arrange the stalk. For this make a rather thin roll. Make a hole with the pointed tool, push the stalk into it, and hold it firmly; then take the ordinary modeller and smooth round the top. To fix the apple on a bowl or mirror, make one side flat, so that there is a good surface for the paste.

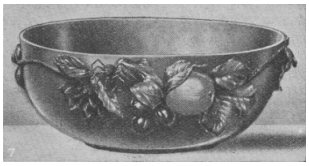


Fig. 7. Bowl painted in coloured lacquers.

Mix a little barbola paste in a tiny wooden bowl, using a few drops of water and a little powdered glue for heavy work. Smear this over the portions of the work which it is desired to affix, and press on to the object, using a tool as far as possible. When it is all quite dry colour it, using barbola colours or, if these are not available, matt water-colours. Bright, pure colours are the most effective. Try rather large fruit and flowers first, as they are easier and do not tend to overcrowd the work.

As the work dries, touch it up where necessary. When all the colours are dry and there is no risk that the paste will shrink, varnish all over with clear varnish. The wreath, shown in Fig. 6, is an equally suitable design for a mirror frame or, in a small size, for an applied decoration to ornament a waste-paper basket or linen basket in cane. A charming effect is gained by leaving some of the flowers silver or gold.

To decorate the bowl shown in Fig. 7, it must first of all be coloured, using for this purpose either quickly-drying lacquer or barbola colour, which is varnished when dry. While the bowl is drying, model the fruit and flowers which are required for decoration. To make the bowl waterproof it is a good plan to coat the inside with gold size, using a large, soft brush.

Having modelled the apple, leave it on a small board to harden, and then model the leaves. To do this roll the paste into a ball, then press it flat and form the shape of a leaf. The sides of the leaf should be held in the two hands and pulled gently towards the worker. This applies to rose petals, as shown in Fig. 2. The modelling tool is then used to finish off delicate hollows, veins of leaves and curled edges (Fig. 3).

Coloured Bronze Powders. Another modern form

of gesso work is executed chiefly in gold and silver and applied on a lacquered background. Its particular charm lies in its lustrous effects produced by using coloured bronze powders. It is used for ornamenting many kinds of household articles, among them candlesticks, mirrors and powder boxes, and is a form of work that affords many opportunities for the skilful modeller. A liquid medium is sold for use with bronze colours, which are obtainable in glass tubes.

Examples of this kind of work are illustrated in Fig. 8. On the left is a powder bowl of papier mache, on which is modelled the head and bust of a dancer. The bowl itself is lacquered a shade of petunia red, and petals of the paste are arranged round the dancer's waist and at the edges of the bowl to represent a billowy skirt. The figure should be done in the ordinary manner with barbola paste, and must be affixed to the bowl before it is dry, as the body must be shaped to the lid of the bowl. Then the long petals forming the rest of the decoration should be modelled and placed in position. In this work the modelling tools should be used as much as possible to avoid handling the finished product, and care should be taken to make the surface rough before sticking on the modelled paste. When the work is quite dry, gild the figure, and the tops of the leaves, and then make the undersides of the leaves silver. To put on these colours use gold and silver bronze powder, and a good washable medium, which should be applied with a soft brush.

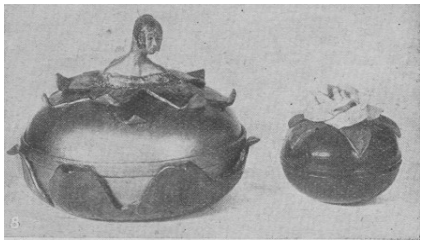


Fig. 8. Powder pot and covered bowl decorated with bronze colours on barbola. The handles are in the form of a dancer's head and an open rose.

For the smaller covered bowl, decorated with a rose, the petals must first be modelled and placed in position, using the modelling tools as much as possible. *(See* Figs. 2, 3.) A few of the petals should be made rather thin to form a centre. Round this centre fix the rest of the petals, pulling them into position, and turning over the edges of some of them. When the rose is finished, put it on a small board, and touch it up with the modeller. It is advisable to finish this before the paste gets hard.

The bowl itself must then be lacquered deep blue. When it is dry scrape the top and place the rose in its position. Then make a few leaves and arrange them round the rose. Next gild the rose, and colour the leaves green, using bright green bronze powder. As soon as this is dry, transparent lacquer can be used, a little scarlet for the centre of the rose, then orange, with yellow for the outer petals. Finally the leaves should be coloured with green lacquer.

GEUM(Avens). These are splendid hardy border plants, some of which will bloom throughout the summer months if the faded flowers and the old stems are cut off. The two best are Lady Stratheden, yellow, and Mrs. Bradshaw, scarlet; both bloom from May to September. Other showy varieties with a shorter flowering season are Orangeman, orange colour, and Fire Opal, orange-red. All these are about 2 ft. high when in bloom. Borisii, 1 ft., has orange-scarlet flowers. Geum montanum. 6 in., and reptans, 8 to 10 in., have yellow flowers in abundance in spring, and are suitable for the rock garden.

GEYSER: FOR INSTANTANEOUS WATER HEATING

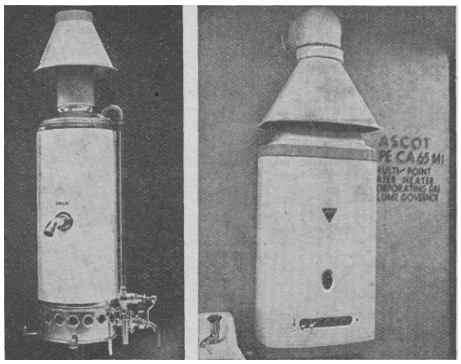
Types for Local or Multi-point Service

Related articles include those on Bath; Cistern; Gas; Hot Water; Water Supply.

The geyser is now commonly known as the instantaneous heater, to distinguish it from other heaters of the storage type. Geysers are made to burn any fuel, but only those burning coal gas are dealt with here, since the principles on which they all work are the same.

The working is as follows: Cold water enters the heater and passes through a system of chambers and/or tubes and in its passage it takes up heat developed by the gas burned in the lower part of the apparatus. Ultimately it emerges from the geyser as hot water, the temperature of which is dependent upon the rate at which the water is allowed to flow. Water at any temperature from tepid to scalding can be obtained.

Broadly, these appliances are divided into two classes namely, those which supply hot water to only one point (as, for instance, a bath, hand-basin or sink) (Fig. 1), and those which supply several points, e.g. a bath, hand-basin and sink on the same supply pipe (Fig. 2).



Geyser. Fig.1 (left): Geyser for the bath, with automatic valve and swing-out burner. Fig. 2 (right): Automatic water-heater for multi-point service. (British Commercial Gas Association)

In both types the flow of gas and the flow of water are made automatically dependent on each other, so that gas is consumed only while the water is flowing.

Sometimes this inter-dependence of gas flow and water flow is ensured by a special gas valve which is actually operated by the water— the gas is

automatically turned down when the water is turned off—and sometimes interlocking taps are used in such a way that the gas cannot be turned on until the water valve is opened.

The amount of gas required to make a bath naturally depends upon the temperature of the cold water, the temperature of the bath water and the amount of hot water required. If the cold water is 60° F. and the hot water is required to be 100° F., then roughly 1 c. ft. of gas (calorific value 500) would be needed for each gallon of water heated. If a temperature rise of more than 40° F. is required, then a proportionately larger quantity of gas would be needed, and vice versa.

A bath of water may consist of 20 to 30 gallons.

Geysers using gas can be obtained in a variety of elegant finishes, including chromium plate and enamel. Their heating powers range from 2 to 4 gallons per minute.

In choosing a geyser, the size is determined in terms of the number of gallons of water to be heated per minute. As the geyser is only capable of imparting a certain quantity of heat to the water in a given time, it follows that the temperature of the water flowing out of the geyser will depend upon the rate at which it is flowing. If very hot (or even boiling) water is required, the water tap must be turned on very slightly, so as to allow only a very small stream of water to flow. If, on the other hand, the water is required to be only moderately warm, the tap may be turned full on.

The size of a geyser to fill a cast-iron bath with hot water at, say, 98° F. in a quarter of an hour or so would be one delivering 2 gallons a min. for a 5 ft. bath, 3 gallons a min. for a 5 ft. 6 in. bath, and for a larger bath a 4 gallons a min. geyser would be necessary. Roughly speaking, again, it may be assumed that a 2 gallons a min. geyser will boil water at the rate of about 2 quarts a min., a 3 gallons a min. geyser at 3 quarts a min., a 10 gallons a min. geyser at 10 quarts a min., and so on.

Fitting a Geyser. The geyser, being an instantaneous water heater, has a high gas consumption during the short time it is on. Its fixing should be carried out only by gas undertakings or responsible firms of hot water engineers, as it is essential that the work should be properly done, that the necessary flue should be provided with an efficient baffler, and that the gas and water supplies and the meter should be adequate in size.

In new houses where a bath geyser is to be installed, a properly built independent brick or cast concrete chimney, terminating above the ridge of the roof, should be provided wherever possible. The flue from the baffler should be let into the chimney, and the end suitably protected from falling mortar. Where, as is generally the case, no chimney is available, the flue leaving the baffler may be dealt with in one of the following ways: *(a)* it may be carried through the wall or roof to end in a suitable terminal; *(b)* if a well-ventilated roof space is available, the flue may be led up to terminate in this, adequate precaution against fire being taken by cutting away laths for the passage of the flue pipe and asbestos packing, and by the protection of exposed woodwork with sheet iron or asbestos compound.

The terminal illustrated in Fig. 3 is an excellent one for use on the flues of geysers where the flue pipe has to be taken through a wall. Its purpose is to induce an updraught in the presence of a wind which would otherwise cause downblow; to present a neater appearance than the older type of terminal, and to prevent birds entering and making a nest. The terminals are made in various sizes and are available in sheet metal or asbestos compound. The metal ones are used in connexion with window boards, and should be mounted flush with the outside wall. The asbestos ones are mounted flush against the wall, the shank being cemented into the wall itself.

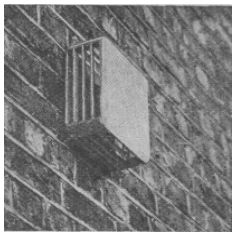


Fig. 3. Terminal for a geyser flue pipe which is taken through a wall.

Ventilation. No gas-heated bath geyser should be fitted in a room without a window, and the window should be capable of being opened—preferably at the top. Where gas-heated geysers are fitted in small bathrooms, it is important that special provision should be made for the ventilation of the room, apart from that provided by the flue equipment of the geyser. The special ventilation can best be provided by the fitting of a 9 in. by 9 in. airbrick in an outer wall of the bathroom. If an ordinary air-brick is fitted, a deflecting board should be fixed over the brick on the room side, to protect the person using the bath from draughts. The smaller the room in which the geyser is fixed, the greater the need for special means of ventilation.

Safety Precautions. A cause of accidents has been the production of explosions due to the application of a match to the gas jet after it has been fully turned on for some time. This is easily avoided by following the instructions issued by the makers; but one or two general points must be attended to. Never turn on a gas tap until you have a lighted match in your hand ready to apply to the issuing gas.

When selecting a geyser, insist upon having one with either an automatic valve or interlocking gas and water taps. If the geyser is of the type in which the burner withdraws from the heating chamber, never light the burner when it is inside the chamber. Always withdraw it first and apply a light to it outside. In most modern geysers of this type, the gas is not fully turned on until the burner is inserted beneath the geyser, so that only a small amount of gas is liberated when the burner is outside. If the geyser is of the type in which the flow of water automatically turns on the gas and cuts it off when it ceases, do not turn on the water without lighting the pilot jet. If the pilot jet is alight and in position, no explosion can possibly ensue when the gas

is automatically turned on. There is also a form of electric geyser for bathroom use, which yields hot water almost instantaneously, but has not achieved the popularity of gas geysers.

GHERKIN. Although it is, strictly speaking, the name of a dwarf-fruiting variety of cucumber, Cucumis sativus, the term gherkin is generally applied to immature and discarded cucumbers of all kinds that are used for pickling and other purposes. The true gherkin can be grown in the open air from seedlings raised in pots in March on a hotbed, and transferred in June to well-manured ground.

How to Cook. Gherkins have various uses in cookery, and are excellent when pickled. They should be left to soak for 3 or 4 days in salt water, then dried and put into a clean jar. Pour into a saucepan enough vinegar to cover the gherkins, allowing to each quart of vinegar 1 oz. of allspice and ½ oz. of ginger. Let these boil for 10 min., then pour it over the gherkins, cover the jar with a plate, and leave it overnight at the side of the fire. In the morning drain off the vinegar, re-boil it, and pour it over the gherkins again. When cold cover the jar with a bladder. The pickle will be ready for use in about six weeks. *See* Cucumber.

GIANT FENNEL. The scientific name oi these graceful plants, with umbrella-like effect of foliage, is Ferula. They are attractive in the spring in the wild garden, but are also remarkable in the summer and autumn, when the branching, flowering shoots reach a height of about 8 ft., and bear innumerable yellow blossoms. The giant fennels should be raised from seed, as they are not easily divided or moved with success. Of several species, F. tingitana and F. communis are those which respond most readily to the culture of the wild garden.

GIBLET: How to Cook. The giblets of a chicken, duck, goose, or other bird consist of the head, heart, liver, gizzard, neck, feet, and the joints of the wings They are usually employed in the making of stock, soup, and pies, but may also be stewed. In stewing, wash and scald two sets of goose giblets, skinning the feet and removing the beak and the inside bag of the gizzard. Cut all into small pieces, and stew them until they are tender in enough water to cover them, seasoning them with salt, pepper, a minced shallot, and a little mace.

Then strain off the stock, and in a separate pan melt a lump of butter about the size of a hen's egg, stirring into it about 1 dessertspoonful of flour. When these are lightly browned, add the stock from the giblets and stir the whole until it boils. Put in the giblets, heat them up thoroughly and then serve.

Giblet Pie. The giblets of a goose or a pair of ducks, some short pastry, and one or two slices of slightly salted breast of pork are the ingredients required to make giblet pie. Clean and scald thoroughly the head, gizzard, liver, legs, the ends of the wings, and the neck, and stew them gently in a little water for about 2 hours. Add 2 or 3 onions, black pepper, a lump of butter, and a little salt, parsley, sweet marjoram and thyme. When the giblets are tender take them from the fire to grow cold, then strain off the stock and remove any excess of fat. Line a pie-dish with short crust, moisten the latter with beaten egg, and place the pork at the bottom, putting the giblets on top. Pour in a little broth. Cover the pie with more pastry, and bake it in a moderate oven for about l ½ hours, pouring in a little more stock before serving. *See* Fowl; Soup.

Giddiness. *See* Dizziness.

GILDING. The process known as gilding consists in coating the surface of an object with an adhesive and applying to it a very thin film of gold leaf. When dry it appears as a solid gold surface The usual method is to apply gold leaf or metallic powder, the best results being always obtained with gold leaf.

The tools required are the gilder's knife and cushion. The knife has a thin, narrow blade like a table-knife. The cushion is a board about 6 in. square, the upper surface padded with flannel and covered with wash-leather; three sides are shrouded with thin card to protect the gold leaf from the wind. The underside has a loop so that it can be held with the thumb and supported by the fingers of the left hand. The cushion is used to support the sheet of gold leaf and to facilitate the cutting operations.

The gold leaf is obtained in books containing about 25 leaves approximately 3 in. square, each sheet separated by a piece of thin tissue-paper. The knife is used to cut the gold leaf; it must be kept perfectly clean and free from the slightest trace of grease. The blade must never be touched with the fingers, but must be wiped from time to time with a piece of clean rag. A gilder's tip, a long camel-hair brush, is employed to transfer the gold leaf from the cushion to the work. Two or three camel and hog hair brushes will be useful for applying the size and manipulating the gold.

Gilder's gold size can be obtained ready for use, a small bottle covering a considerable amount of work. Suppose that the work is already cleaned and prepared. The gold size is brushed over the part to be gilded, and it is absolutely essential that it should be applied thinly and evenly: if there are little mounds of size on one part of the work, and scarcely covered portions on another, the result will be failure. The next step is to protect the work so that no dust can settle upon it.

The size should be fit to receive the gold after 12 hours, but no hard and fast rule can be laid down as to the right time to apply the gold leaf. If the size is wet, it will work through the gold leaf and result in a muddy appearance; if too dry, the gold will not adhere properly. It is best to make some trials on an odd piece of work and to learn by experience. When the size is judged to be in good condition a little of the gold leaf is

laid on with the gilder's tip, and pressed down lightly with a pad of cotton wool covered with soft linen. The surface of the gold is then brushed over with a soft hog-hair brush, and if the gold remains in position and appears bright and lustrous, all is well.

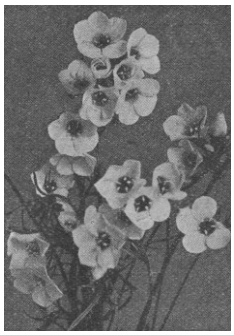
An actual piece of work can now be undertaken by taking a leaf of the gold and, with the aid of the knife, laying it upon the cushion. Do not touch the leaf with the hands, as any grease will spoil the contact. A strip of the requisite width is cut off with the knife, picked up with the tip and applied to the previously sized work, pressing it into place and brushing over the surface of the gold, the process being continued until the whole is completed. A sheet of clean white paper should be laid underneath to collect any gold powder that falls. After being left in a warm, dry place for a couple of days, the work is finished with ormolu size, a varnish of shellac and elemi, or gamboge, which can be bought ready for use.

Regilding a Frame. To prepare a gilt frame for regilding, after removing the picture the gilt work is washed in a weak solution of soda, in lukewarm water, rinsed with clean cold water, and thoroughly dried. Any cracks should be made good with a putty composed of whiting, yellow chrome, and size. When this is dry, paint the frame with a mixture of whiting and a red or yellow pigment to make a rich yellow-gold colour. Mix this with size to the consistency of thin paint, then strain it through a piece of muslin, and while it is still warm brush it on to the frame. After it is dry give it a coat of size, and the gilding may then be proceeded with.

Most frames are gilded in several different ways, and comprise a burnished portion, a matt portion, and modelled parts that have to be done with gold size. The burnishing is done with burnishers generally made of agate or bone. The frame is brushed over with gilder's burnishing size the consistency of thick paint, spread evenly, allowed to dry, and rubbed down with old sandpaper until it is perfectly smooth. It is then dusted and another coat applied. This is allowed to dry and rubbed down as before, after which the work is brushed to remove all dust.

The gold leaf is applied by wetting a part of the frame with water size, laying the gold upon it and blowing gently upon it to force it into contact with the work. If any cracks appear, or there are any portions deficient in gold, damp the parts and apply another piece of leaf. After this it is burnished by rubbing it with a burnisher until a brilliant polish is imparted. Matt gilding is accomplished in the same way, or by the use of gold size, but is finished off by sizing the surface with a mixture of gamboge and size. An alternate method of finish is to paint the whole of the frame with scalding hot isinglass water, coloured with a little saffron or other similar colour. *See* Mirror.

GILIA. Most of the gilias are hardy annuals which bloom in summer from seeds sown out of doors in April; they may be raised under glass in March and planted out in May. They grow 12 to 18 inches high. The best are capitata, lavender; nivalis, white; tricolor, lavender and white; and tricolor rosea, rose colour. The finest of all is Gilia coronopifolia, which is often grown as a biennial and raised from seeds under glass in June to provide flowering plants the next year; it will, however, bloom in summer from seeds sown under glass in warmth in February. The brilliant rose-scarlet flowers are on stems 2 to 3 ft. high. Pron. Jil'i-a.

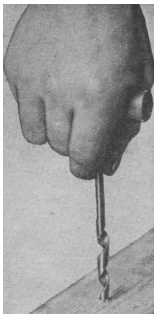


Gilia. Delicate blooms and leaves of a dainty hardy annual.

Gill. Measure of capacity. It is the fourth part of a pint.

GILLYFLOWER. This is the old English name for carnation. It is sometimes applied to wallflowers and stocks. *See* Carnation; Wallflower.

GIMLET. This is a woodworker's tool used for boring small holes, generally prior to inserting a screw. It comprises a handle, and a steel rod pointed at one end, with a tapering screw thread of variable pitch. It is used by pressing it upon the work and rotating the handle in the manner illustrated.



Gimlet. How this woodworker's tool should be held when in use.

The rotation of the gimlet causes it to screw its way into the wood, and should cut the wood after it has entered a short distance. It should be kept clean and bright, with the edges of the cutting thread quite sharp, as a blunt gimlet, choked up with chips, will split the wood. A bell-hanger's gimlet is made with a long shaft, sometimes 3 ft. in length. The extremity is formed like an ordinary gimlet, but the blade is larger in diameter than the remainder of the stock. It is employed for boring holes through thick joists, or at a considerable distance, and will be found useful in making holes through which to pass electric bell wires. *See* Amateur Carpentry; Boring.

GIMP. Flat ornamental edging used as a finish in upholstery is the commonest form of gimp, and usually it is of a looped formation. Gimps are quickly and cheaply made by machine to match the colourings of chairs, settees, or cloth curtains, and can be had to order. Looped yarn for use in knitting shawls receives the name of gimp from the presence of little loops or curls upon its surface. In lace the gimp thread is a braid or cord used to thicken or outline the pattern. Fancy braids for trimming are sometimes known as gimps.

GIN. Gin is made from maize and barley flavoured

with juniper berries. There are several varieties. Old Tom has a small percentage of sugar; dry or unsweetened gin has none. Plymouth gin is said to be the purest: genièvre, well known in various European countries, is made from corn.

Gin does not improve much with age. It should be of white colour, unlike old Hollands, which is of straw colour. Gin and bitters is a favourite appetiser, and gin forms the basis of many cocktails, such as gin fizz, gin julep, gin sling, gin smash, and many others. Sloe gin can be made at home with the juice of sloe berries. *See.* Cocktail; Sloe Gin.

GINGER. Ginger is much used in cookery as a powder, when it is known as ground ginger, as preserved ginger in syrup, or as whole ginger. The last-named is also termed root or stem ginger, and the pieces are a pale buff colour, tough and fibrous. Whole ginger is usually bruised, i.e. well beaten with a rolling pin or similar article, so that the flavour is more easily extracted.

Ground or whole, it is best to buy ginger in small quantites, as it soon loses its pungency. Preserved ginger is sold in jars of varying sizes. Its main use is in the form of dessert, but, like ground ginger, it is also employed in the making of cakes, puddings, etc. The syrup in which it is preserved is used for flavouring purposes.

Medicinal Uses. The most important constituent of ginger is an aromatic volatile oil which gives it its well known flavour. Ginger is chiefly used in medicine, dose 5 to 15 grains for its stomachic and carminative effects. It is also a common flavouring agent. Ordinary preparations are the syrup of ginger, dose ½ to 1 dram, and the tincture of ginger, ½ to 1 dram. Tincture of ginger is an old-fashioned and sometimes efficacious remedy for flatulence. *See* Flatulence; Indigestion.

GINGER ALE. Except that extract of ginger is used in place of the root, ginger ale is made on similar lines to ginger beer, but with the addition of bitter flavours. These include one or more of the following: tincture of capsicum (cayenne pepper), gentian, cardamom seeds, tincture of cinnamon, camomile, oil of rose, or geranium, etc. Sufficient caramel is added to give a golden colour. These materials are added after cooling and before fermentation.

GINGER BEER. This beer can be made from ginger root and pure cane sugar alone, but the addition of one or two other ingredients is an improvement. The simplest method for brewing it at home is the following: assuming the copper holds 5 gallons, a wooden tub of the same capacity is required. Get the copper quite clean and free from grease, but do not scour it bright. Fill it with water and bring the water to the boil.

While this is heating weigh 8 oz. of ginger root and crush it by putting it in a linen bag and pounding it with a hammer on a stone. Directly the water boils add the crushed ginger root and draw away from the fire so as to stop boiling. Let it stand for three hours, covered to keep the heat in, and stir occasionally.

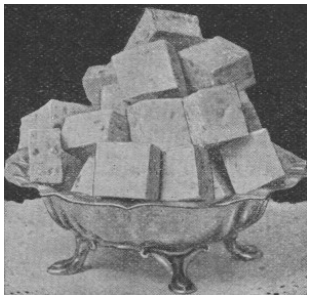
Put 5 lb. white granulated sugar in the tub, then strain through muslin the hot ginger root liquid from the copper on to this sugar, and stir it till dissolved; cover the tub, and when the liquid is quite cold bottle it. In about three weeks the ginger beer should be brisk with gas and ready to drink. If it is wanted sooner, 3 oz. fresh brewer's yeast may be stirred into the tub directly the ginger beer is cold, and bottling done 24 hours later. The beverage will be ready to drink in a couple of days.

GINGER BISCUIT. Ginger biscuits are made by sieving together ½ lb. flour, ½ teaspoonful ground ginger and ¼ teaspoonful bicarbonate of soda and the same of salt. Rub into these 2½ oz. butter and mix to a stiff paste with golden syrup. Knead the paste together, roll it out on a floured board to the thickness of ¼ in. Cut it into round biscuits and bake in a moderate oven for 15 minutes. *See* Biscuit.

Gingerbread. *See* Cake.

GINGER CANDY. To make ginger candy, put into a pan over the fire 12 oz. sugar and ¼ pint of cold water, and when the former is dissolved add 2 oz. glucose and a lump of butter about the size of a walnut. Boil these to 240°, then add a small ½ teacupful of preserved ginger in syrup, about 6 drops of gingerine or any ginger flavouring, and a dessertspoonful of ginger syrup. Stir the whole gently and continue boiling and stirring until it has reached 248°.

Pour the mixture into a basin previously rinsed in cold water and leave it for 5 min., then stir it with a wooden spoon until it is thick and creamy. Cover it with wax paper and a thick towel, let it stand for about 20 min., then knead it thoroughly with a spatula and the hands, finally patting it out between candy bars set on wax paper. When set it may be cut into cubes or any other shape desired.



Ginger Candy, a delicious and wholesome sweetmeat.

GINGERNUT. To make these, take 1 lb. soft flour into which has been sifted ½ teaspoonful bicarbonate of soda and the same quantity of cream of tartar. To this flour is added 1 ½ oz. butter or other good fat, 2½ oz. castor sugar, 1 teaspoonful ground ginger, and ½ a teaspoonful powdered mixed spice. A stiff dough should be made with about 6 oz. warmed

golden syrup. Roll this out about ⅛ in. thick, and cut with small plain
cutter. The biscuits spread a little, so must be placed slightly apart on the sheet. This should be slightly greased, and then sprayed with a little water before the biscuits are placed on it. Bake them in a moderate oven for 12-14 min. They are soft when finished, but harden on cooling. *See* Biscuit.

GINGER PUDDING. A steamed ginger pudding can be made in the following way: Mix together ½ lb. flour, 2 teaspoonfuls ground ginger, ¼ teaspoonful carbonate of soda, ½ lb. chopped suet, 2 oz. candied peel cut into small pieces, ½ lb. breadcrumbs, and ¼ Ib. Demerara sugar. Warm 2 tablespoonfuls golden syrup and pour it into the centre of the dry ingredients, mixing the whole together with a little milk and water to a wet consistency.

Beat the mixture well before turning it into a greased basin covered with greased paper, not a pudding cloth; then stand it in a saucepan half-full of boiling water and steam it for 2½-3 hours. Serve the pudding on a hot dish, with hot custard, if liked. This is sufficient for six persons.

GINGER ROCK CAKE. Small ginger rock cakes are made by sieving together ¾ Ib. flour, 1 teaspoonful ground ginger, ¼ teaspoonful powdered cinnamon, and ½ level teaspoonful of bicarbonate of soda. Rub into these 7 oz. of margarine; then add 6 oz. white sugar, and a teaspoonful caraway seeds.

Mix these ingredients to a stiff paste with a beaten egg and, if necessary, a little milk. Grease a baking-sheet and drop the mixture on to it in small, rough heaps, leaving a space between each. Blanch 1 oz. almonds, stick one on the top of each heap, and then bake the cakes in a hot oven for 15 to 20 min.

GINGER SAUCE. A good ginger sauce can be made by heating ½ pint milk in a small pan over the fire and in the meantime mixing the yolks of 2 eggs and the white of one in a basin containing about ¾ oz. sugar. When the milk is hot, pour it on to the contents of the basin, stirring all the time, and mix thoroughly. Return to the pan and stir it until it thickens without boiling. Just before it boils pour the sauce into a basin and add sufficient ground ginger to taste.

Ginger Snaps. *See* Brandy Snap.

GINGER WINE. Ginger wine is made by boiling together for ½ hour 3½ gallons of water, 12 Ib. sugar, ¼ Ib. good bruised ginger, and the thinly peeled rinds of 6 large lemons. Put the whole when lukewarm into a clean, dry cask, with the juice of the lemons and ½ Ib. sultana raisins. Then add 1 tablespoonful of thick yeast, and stir the wine daily for 10 days. When it has ceased to ferment, add 1 oz. isinglass and a pint of brandy; bung the wine closely, and bottle in two months.

GINGHAM. Long a favourite tor children's dresses, house and summer frocks, aprons and overalls, gingham is a cotton fabric made principally in check designs. The patterns range from simple block checks up to elaborate plaids in two or three colours. The cloth normally is finished pure, or with very little loading. The pattern is not printed, but woven from yarn usually dyed in fast colours. The general effect is bright and clean-looking.

The advantages of gingham led to its use in other spheres; for instance, as breakfast cloths, curtains for kitchen or cottage casement windows.

Coloured checks are sufficiently showy in themselves, but an original touch can be added by cross-stitching simple designs upon some of the white chequerings. To ornament every white square is to invite an overcrowded appearance, and it is advisable to select squares at intervals for treatment in one or two colours; or a plain border in white or to match the colour of the check may be embroidered with the design. For example, a daffodil yellow check gingham cloth could have a 6 in. white linen border with a cross-stitch design in the yellow. When washing gingham which has faded, add a little vinegar to the last rinsing water. This will help to revive the original colour. *See* Embroidery.

GINSENG. This is a plant of the genus Aralia, from the root of which a drug is exracted. That obtained from the wild plant is regarded as better than that obtained from the cultivated one, and the older the root the better the quality, so it is believed. The drug, which is slightly hitter and aromatic to the taste, was formerly believed to possess wonderful medicinal powers, but the existence of these is now doubted. It is, however, widely drunk in China as a specific for all manner of bodily ailments.

GIRANDOLE. This is a branched candlestick used for a cluster of lights. They are usually ornamented, the design being frequently made to imitate bunches of flowers. *See* Candelabrum; Candlestick.

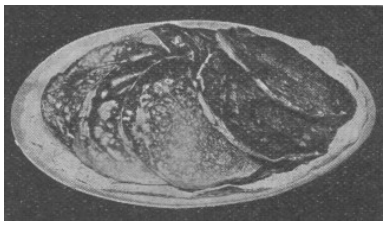
GIRDER. A girder is a principal and horizontal beam of wood, or more generally of iron or steel, which rests upon supports at either end or at different positions throughout its length, to support a load. The load may be distributed along its entire length or at different points throughout its unsupported length.

As a general rule girders are formed in what is known as the I shape, that is, in the form of the letter I, with flanges at the top and bottom, these being slightly thicker in section than the web or upright piece which connects them. The modern girder usually is composed of special steel, and when rolled from one solid bar is known as a rolled steel joist. In engineering practice a girder means a compound structure forming a beam to receive a vertical load. It is made up of several pieces,

which are riveted together at the joints.

GIRDLE or Griddle. This cooking utensil consists of a circular piece of iron, about 12 in. in diameter, spanned by a strong metal handle. It is used in the making of girdle cakes, etc. The girdle is greased and heated over the fire, the dough being dropped on it when it is hot.

Girdle Cake. These light teacakes, also known as Scotch pancakes or drop scones, are made with batter and cooked on a girdle. To make them, beat together an egg and 4 tablespoonfuls of milk, add a pinch of salt and, if liked, a pinch of sugar. Sift in enough self-raising flour to make the whole into a batter stiff enough to drop, not run, from the spoon. More flour or more milk should be added until this consistency is attained.



Girdle Cake. Dish of the teacakes also known as Scotch pancakes or drop scones.

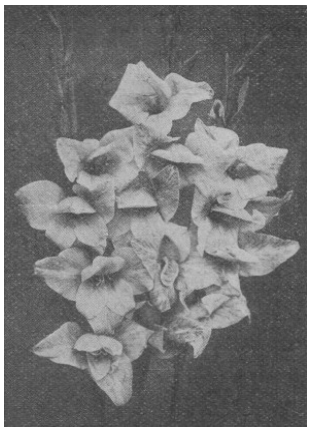
Beat the batter well, then grease the girdle and heat it over the fire. When it is hot, drop spoonfuls of batter on to it, so that they will form neat rounds about ½ in. thick. When brown on one side (and they will take a very short time to cook), turn them over. This will make about 18 small scones. If there is no girdle in the house a frying-pan can be used, but great care is then needed to see that the cakes do not burn. They can be eaten either hot or cold, and require plenty of butter.

GLADIOLUS. An indispensable garden flower, this is in full beauty in late July, August and September. Varieties of the early flowering type grown in pots under glass bloom in late spring and early summer.

In recent years new types and innumerable new varieties of gladioli have been raised, and among them are many beautiful flowers. There are two distinct types of late summer-flowering gladioli, the large flowered, and the primulinus or small flowered. The recent astonishing progress in popular favour of this flower dates from the introduction of the yellow Gladiolus primulinus from the vicinity of the Zambesi Falls early in the 20th century; its flowers are small and of hooded shape, and the growth is slender.

By crossbreeding between this species and varieties of the large-flowered gladioli a remarkable new race has been obtained which has slender, graceful growth and medium-sized flowers of remarkable and varied colouring— yellow, orange, salmon, primrose, apricot, rose, and other tints. Meanwhile the range of colour of the large-flowered gladioli has also been extended, and modern varieties have particularly fine spikes of bloom —one spike may bear seventeen or more flowers.

Both types are invaluable for garden display and for cutting. If the spikes are cut when the lowest flowers are out the others will open in water indoors. It would serve no useful purpose to give the names of varieties, for they are innumerable, and many similar ones have different names. They are fully described in the growers' catalogues.



Gladiolus. The primulinus type, which bears small flowers in many brilliant colours.

The cultivation of the gladiolus is a simple matter. The corms or roots are planted in March or April, 2 in. deep and 6 to 8 in. apart, in well dug soil enriched with decayed manure; it is worth while adding leaf-mould and sand to clayey ground. Ashes from the garden bonfire are also beneficial. Gladioli look especially well in groups in the herbaceous border or in flower beds carpeted with dwarf white alyssum or other low growing plants. In October, when the leaves begin to turn yellow the plants are lifted, and placed under cover for a week or two; dead leaves and soil are then removed and the corms are stored in paper bags in a frostproof place for the winter ready for planting in spring. By setting corms at intervals of 10 days from early March until mid-April a succession of bloom is assured.

The corms of early-flowering gladioli are potted in autumn, kept in a cold frame for 6 or 8 weeks and then placed in the greenhouse. A temperature of 50 degrees is high enough. Favourite varieties are Colvillei, The Bride, white; Blushing Bride, blush; and Salmon Queen, salmon.

Gladioli are propagated by seeds sown in a 10 in. deep box of soil placed under glass in March or out of doors in April; the seedlings should not be disturbed until the leaves have died down in autumn. If planted on a reserve bed the following spring some of them will bloom in summer, others may not do so until the next year.

GLADWYN. This is the name given to one of the iris family of flowers, Iris foetidissima. It is a native iris, with greenish flowers, about 2 ft. in height, and is remarkable for the bright red seeds which make their appearance after the flowering period is over. It likes a moist soil . *See* Iris.

GLAND. Literally meaning acorn, this name is given to a collection of specialized cells which manufacture certain substances needed by the body. Some discharge their fluid through a duct, and others, the ductless glands or endocrines, pass it directly into the blood. Glands are of many different kinds and are of great importance in the maintenance of the health of the body. *(Continued in page 968)*



Catharina



Buff-coloured Souvenir



Vespasian



Golden West



Maiden's Blush



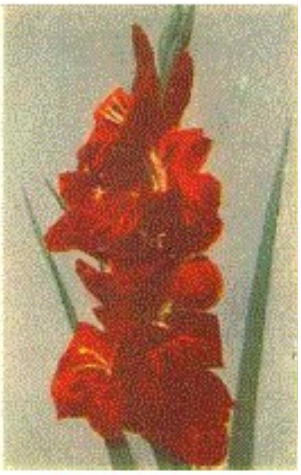
Willy Wirgman



Liebes Fener



Halley



Marshal Oyama

GLADIOLI: CHOICE VARIETIES OF THIS FLOWERING BULB

General instructions for Gladioli culture are given at heading Gladiolus.

GHERKIN CROÛTES. Gherkin Croûtes are made by frying in butter 6 rounds of bread about the size of a florin until a golden brown. Chop white of 1 hard boiled egg. Rub yolk smoothly into 2 teaspoonfuls butter. Season. Spread layer on each croûte. Cut 4 pickled gherkins into strips and arrange in lattice pattern on top, trimming off projecting ends with scissors. Arrange chopped white of egg in narrow border round edge of each croûte

GERMAN BISCUITS. For German Biscuits sieve 4 oz. flour, rubbing in 2 oz. butter and adding 1 oz. castor sugar. Knead to smooth paste, form into ball and roll out to about ¼ in. in thickness. Stamp out rounds; bake in slow oven until they are pale biscuit. When cold, spread layer of red currant jelly on one side of half the number of biscuits, cover with remainder, and pour white icing over each. Finish with half a glacé cherry



GAME SALAD. Any cooked game can be used for Game Salad. Remove bones from meat, season, and cut into dice. Cut round slice from top of a custard marrow and scoop out inside. Prepare 2 lettuces and 1 endive, using only white part of latter, and pull into small pieces. Peel half a small cucumber and cut into strips like matches. Peel a tomato and cut into slices. Mix about ⅔ of the salad with a little mayonnaise, put a layer in the marrow, then pile up the game. Cover with remainder of salad. Serve some mayonnaise sauce separately

GOOSEBERRY HUFF CAP. For Gooseberry Huff Cap, trim 1 qt. green gooseberries. Put in jar with 2 oz. lump sugar and cook till soft. Boil 6 oz. lump sugar with 1 gill water until thick, then rub gooseberries through sieve, add the syrup to the pulp with whites of 3 eggs stiffly whipped. Whisk all together until frothy. Cut off top of Madeira or sponge cake; hollow out inside until only a case remains. Soak case slightly with wine or custard. Heap fruit into the case and decorate the whole with 1 oz. sweet blanched almonds cut into long shreds

'G' RECIPES: A SELECTION SHOWN IN ACTUAL COLOUR

Ginger Soufflé. Beat up yolks of 2 eggs and mix with 1½ gills milk. Pour into jug placed in saucepan of water over fire., stir until thick, then leave to cool. Whisk 1½ gills cream until thick, add half to cold custard, mix lightly and add 3 oz. preserved ginger (diced) and 2 dessertspoonfuls castor sugar. Whisk 2 egg whites to stiff froth and fold in. Strain in ½ oz. French leaf gelatine previously dissolved in ½ gill ginger syrup. Stir all over ice until thick, then pour into soufflé case. When set decorate top with remainder of whipped cream, small lump of ginger and piece of angelica. Gooseberry and Cherry Custard. Dissolve ½ pt. packet cherry jelly in hot water and leave to set. Boil 3 oz. Demerara sugar in 1 gill water for 5 min. Add ½ lb. stalked cherries. Simmer for 10 min., and add 1½ pt. trimmed gooseberries. Simmer until fruit is tender. Put in glass dish, and cover with 1½ pt. cool custard. When cold, chop the jelly and arrange on custard. Game Scallops are made with cold game chopped, flavoured, mixed with browned breadcrumbs and enough thick brown gravy to moisten well, baked in scallops in quick oven.

Lymphatic glands are widely distributed over the body. They consist of masses of lymphoid tissue in connexion with the lymph vessels which collect used-up fluid from the tissues and carry it back to the blood. They act as filters, stopping in some degree various poisonous matters on their way to the blood.

Inflammation and enlargement of lymphatic glands (lymphadenitis) is a common consequence of any irritating matter which reaches them through the lymph vessels. A wound in the hand may thus cause swelling of the glands in the armpit, or a wound in the foot or leg of those in the groin.

One form is inflammation of the lymph glands of the neck, due to their invasion by the tubercle bacillus, and commonly known as "glands in the neck." A child with a constant cold in the head is liable to develop tuberculous glands of the neck. Eczema of the scalp, suppuration in the ear, decayed teeth, may all set up irritation of these glands and favour their infection by the tubercle bacillus. Treatment should be directed to the cause. *See* Glandular Fever; Mumps; Tuberculosis.

GLANDERS. Also known as farcy, this infectious disease of the horse, ass, and mule is communicable to other animals, including man. It is due to a germ known as the bacillus Mallei. When the nasal cavity is affected the condition is known as glanders, but when the lymphatics are involved, and there are nodules under the skin, it becomes farcy, the nodules consisting of the farcy buds.

Coachmen, stablemen, and others who have to do with horses are the persons most likely to contract the disease, and the danger is increased if they have cuts or abrasions about the hands. Anyone suffering from the disease can convey it to another.

The site of infection becomes red and inflamed, and the inflammation spreads along the lymphatics to the nearest lymphatic glands, which become swollen and painful. There is fever and the patient feels ill. He may pass rapidly into the typhoid state, and his condition will look like the form of blood poisoning known as pyaemia. Commonly there is a purulent discharge from the nose.

GLANDULAR FEVER. Children are affected chiefly by this infectious disease, which sometimes appears as an epidemic, attacking all or most of those in the house or in a school.

The neck becomes painful, the glands of the neck enlarge, and some of them may become as large as an egg. Occasionally the glands in the armpits and in the groin enlarge. The temperature may rise to 103° or 104°. Early in the second week the fever disappears; and there may be diarrhoea. The swollen glands then slowly return to their normal size, but may remain enlarged for weeks or months. The usual treatment for this disease is to apply hot fomentations to the glands two or three times daily.

GLASS AND GLAZING

Choice, Cutting and Uses of Glass in House and Garden

This article deals with glass as used for windows and general constructional work. It is followed by one on Glass Ware, while other entries related to the subject are Leaded Light; Mirror; Picture Framing; Window.

See also Conservatory; Frame; Putty etc.

At a casual glance all sheet glass may appear to be of substantially two forms, plain or transparent, and obscure or rippled, but there are in fact many kinds of sheet glass, with various properties rendering them suitable for specific purposes. Ordinary sheet glass is made in three varieties, known as crown, sheet, and plate glass.

Crown glass is made by blowing the glass in such a way that it ultimately forms a sheet with a boss, or bull's eye, in the centre. This method is not often practised nowadays, but the bull's eyes are valued for their decorative use in windows, doors of cabinets, and other positions. Ordinary sheet glass, such as that used for windows, is made in tubular form, cut, flattened, and afterwards annealed. The usual size is up to 12 to 16 sq. ft. in area, while the weight varies according to thickness from 15 to 42 oz. per superficial foot.

By the area of the glass is meant the number of square feet it contains, and by the weight in oz. is meant the approximate weight of a piece of glass exactly 1 ft. sq., that is, 21 oz. glass means that 1 sq. ft. of it would weigh 21 oz. Thickness and weight vary with different manufacturers, as does the grade or quality. Approximately, 15 oz. glass is a little over 1/16 in. thick, and 21 oz. glass about 1/10 in., while 42 oz. glass is about 1/5 in.

Sheet and Plate Glass

The objection to sheet glass is that it always imparts a wavy, or broken appearance to the objects seen through it. For ordinary window purposes this may not be an objection, especially if a first-grade sheet glass be used, but for good class work, or in windows where the view should be unimpaired, polished plate glass should be used. Sheet glass can be purchased at so much per sq. ft. from picture-frame makers, or from builders' merchants, or ironmongers. This method is suitable when only a small quantity is required, as the sheets are cut to the size specified.

If a quantity of glass is required, a case or box may be purchased, which usually contains 200 or 300 ft. of glass, that is, a sufficient number of pieces of glass to cover an area of 200 or 300 sq. ft. as the case may be. The sizes of the pieces and their thickness might either be uniform, as, for example, so many pieces of a certain size and all, say, 21 oz.; or it is sometimes possible to buy a mixed case, containing two or three different sizes, or varying in thickness. Many stock sizes are available, and particulars can generally be obtained from the local builders' merchant.

This method of purchasing glass is particularly economical for such constructions as greenhouses and garden frames, where quantities of glass of uniform width can be used, and if the nearest stock-sized glass

be ascertained before fixing the bars in new work, it will be found to save considerable expense for glass-cutting. As regards thickness, sheet glass of 15 oz. should only be used for small frames or for little panes in windows; 21 oz. glass is generally recognized as the thinnest that should be used, and if the window is of any size, such as a sliding sash, a heavier glass is preferable.

Plate glass is made by casting, grinding, smoothing and polishing. Hence it is uniform in texture and thickness, and the objects seen through it are not distorted in any way. It is made in various thicknesses from 3/16 in. upwards, and up to 100 sq. ft. or more in area. It is purchased according to fractional sizes, that is 3/16, 1/4, 3/8 in. etc., in thickness. Plate glass is used extensively as a covering for the tops of dressing-tables and other places where a clean surface is needed. The edges should be ground and polished, and, if necessary,, holes drilled near the corners for fixing the glass in place.

Plate glass can be bent by the makers to various shapes such as are required for the curved ends of a cabinet or other furniture, or for a window, but as a rule the amateur should avoid bent glass as it is very difficult to bring it to the exact curvature desired. For small areas, up to about 2 or 3 sq. ft., 3/16 in. plate glass is satisfactory, but polished plate glass is generally about 1/4 in. in thickness.

Fancy Glass. Of the fancy or patterned glasses, those known as the rolled plate are perhaps the most useful to the amateur, and are made in different patterns, some quite ornate and others softly waved and subdued in texture. They are used in partitions or places where light is needed but vision is to be obstructed. Prismatic glass diffuses light and gives better internal illumination; it is used for lighting basements and other dark parts of buildings. Coloured glass is generally in the form of ordinary sheet glass.

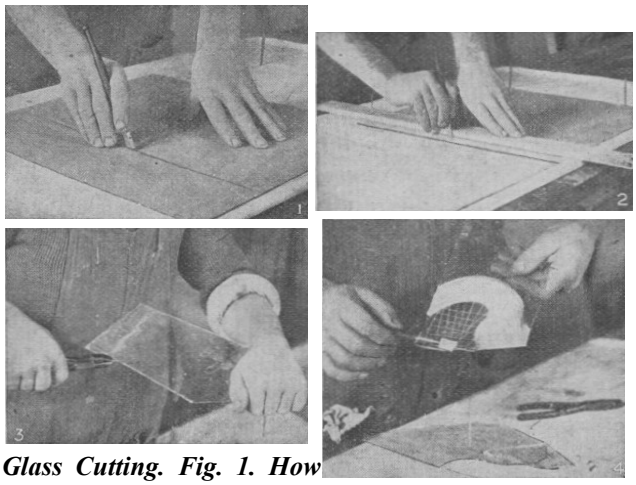
Of the special glasses, those made with wire netting embedded in the centre and known as wired and cast, rolled, or polished glass, according to their method of manufacture, are about 1/4 in. thick, and are used for roofs, windows and doors. They cannot be cut with a diamond in the ordinary way, and therefore are partly burglar-proof. They are also to a large extent fire-resisting.

Another kind of glass is made up of several layers cemented together. It is used for all purposes where glass is liable to fracture, e.g. a motor car wind screen. The material will resist heavy blows without splintering.

A proprietary glass which passes the health giving ultra violet rays is coming into common use for windows in houses, offices, and factories. Its use entails only a comparatively small outlay to the houseowner.

When purchasing sheet glass to fit into a specific size frame, it is customary to make an allowance for the roughness of the edge of the glass, the amount of this allowance being determined by the width of the rebate in the frame. For example, if the frame is 24 in. wide and has a rebate in it, say 1/2 in. wide, thus leaving a sight opening of 23 in., the glass should be ordered as 23 5/8 in. in width. It is advisable to inform the dealer of the purpose for which the glass is required.

Cutting Glass. The cutting of glass is carried out with a diamond pointed tool, or with a hard steel glass cutter. The former is expensive to buy, and requires considerable skill to manipulate in an effective manner. The steel cutters comprise a wooden handle with a steel end-piece or block fitted with a small circular plate carrying two or three small steel wheels, one of which projects beyond the end of the head and does the cutting. When it gets blunt the screw holding the circular plate is loosened and a fresh wheel brought into position by partially revolving the circular plate and again screwing it up tight.



Glass Cutting. Fig. 1. How to hold the diamond.
Fig. 2. Bench arrangement of battens and nails for guiding the cutter and making sguare cuts.
Fig. 3. Breaking away the glass with pliers.
Fig. 4. How to cut a hollow, curved piece of glass. Note criss-cross cuts and use of diamond to tap out the pieces.

To use either of these cutters they should be held in the right hand in the manner shown in Fig. 1, with the handle between the first and second fingers and the thumb behind them. The diamond is set at a certain angle in the end of a steel block, pivoted on the handle and free to move through about 45°; this is to facilitate the cutting of intricate shapes and to allow a certain amount of latitude when cutting long straight lines. The particular angle at which the diamond must be held varies with each individual stone, and must be learned by experience, the best cutting angle being judged by the sound. When cutting properly the sound should have a ripping quality; when the diamond is wrongly held it is more like a scratch. The tool is usually held in a nearly upright position.

For ordinary use in the home the wheel cutter answers all requirements and will stand more rough treatment than a diamond. As an example, if a new pane is wanted for a window, and it is to be cut from a piece of odd glass, lay this on a firm flat table-top on which has been placed a piece of thick cloth, and place

a steel or wood straight-edge on one side of the glass. Bringing sufficient pressure to bear on the cutter, draw it once across the glass, guiding it by the straight-edge. If the glass is thin it will sever easily if turned upside down with the line of the cut resting on the edge of the table, or upon a clean straight batten, and the surplus glass pressed down. The end can now be cut, guiding the cutter with a set square, or preferably a glazier's tee square: the opposite end and remaining side are then cut. When placing the straight-edge as a guide for the cutter, be careful to allow for the thickness of the cutter block, otherwise the glass will not be the proper size.

The cutting of glass to fancy shapes, such as those needed in leaded light work, is rather more difficult. One method is by preparing a full-size drawing of each piece of glass, then drawing a parallel line on each side of the outline. The distance between the outer lines represents the thickness of the heart of the lead, and consequently the true shape for each piece of glass; it is to these lines that the glass is cut. Another method is to cut a set of thin cardboard patterns to the exact shapes of the glass, and to employ them as templates.

A simple device for cutting diamond or other panes is illustrated in Fig. 2, and comprises a lath of thin wood nailed to the bench. Two nails are partly driven into the bench at right angles, or at any required angle; the edge of the piece of glass is rested against these. Two other nails are also driven into the bench and a straight-edge laid against them, this acting as a guide for the cutter. The method is effective when several pieces of the same size are wanted, as it avoids the need for repeated measurements. Circles are generally cut with a special tool known as a circular glass cutter. It has a central pivot, adjustable arm, and a wheel or diamond.

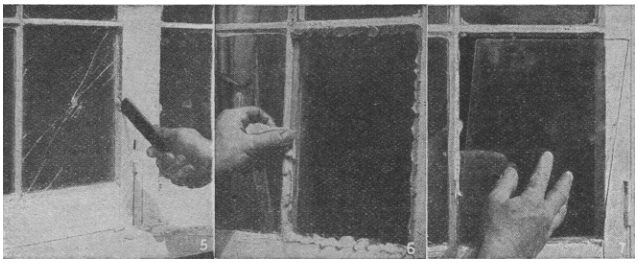
When cutting curves the outside curve will come away easily, but a notch, or interior curve, will have to be cut across and across, and the parts removed one by one somewhat as shown in Fig. 4. To separate the glass when cut to curved forms, tapping is necessary. This consists in striking the back of the plate of glass with the block of the cutter, carefully following the line of the cut. Steady tapping is important, and if the glass has been properly cut the fracture will run along it at each tap. Any ragged edges can be trued up by grozing, a process consisting chiefly in biting off the ragged edges by means of a pair of pliers, using the jaws to squeeze or bite the edge of the glass as shown in Fig. 3.

Finally, the worker in glass should remember a few simple rules. The glass should be supported on a really flat surface such as a drawing-board. If much cutting is to be done the board should be ruled with two sets of lines, 1/4 in. apart at right angles, to divide it into a number of squares. This will save marking when the glass has to be cut on the square. When cutting properly the diamond makes a soft sound and leaves an almost invisible scratch, while a large rough scratch shows a bad cut. A cut should be started and finished at the very edges. Extra thick glass should be tapped on the side away from the cut.

Glazing Windows. In the case of a broken pane in a window the first thing to do is to remove the broken glass by gentle tapping and lifting out the fragments. If the glass has been fitted by a wooden bead, it must be unscrewed or prized out of its place with a chisel. Most windows, however, are secured by putty. This is best removed with a hacking knife, as shown in Fig. 5. The work must be done thoroughly: if any lumps of old hard putty are left in the frame, they will strain the glass and ultimately make it crack.

If the frame is shrunk and the putty exhibits small cracks, it should be removed by inserting the end of the blade into the cracks and levering the putty out. In exceptional cases it will have to be chipped, by tapping the back of the blade with a small hammer. As this work proceeds, remove the fragments of glass, taking care that those on the top part of the window do not fall out instead, and cut the hands. If working on a first-floor window care must be taken that fragments of glass do not fall on anyone beneath.

When all the old putty has been removed, the rebate must be measured. This should be done at the top and bottom and at both sides, in case the window-frame is not perfectly rectangular. A piece of glass may now be cut, slightly less than these sizes; in most cases about 1/8 in. less will be correct. The putty must be worked up, softening it by rolling it between the palms of the hands until it is quite plastic. If it shows a tendency to crumble, moisten it with a few drops of linseed oil, and again roll it between the hands.



Glass . How to glaze a window. Fig. 5. Hacking out old putty with the hack knife. Fig. 6. Applying a uniform layer of new putty all round the frame. Fig. 7. Method of inserting glass pane, with one hand each side.

Place some of the putty into the corners of the rebate, and apply it with the finger and thumb to a uniform thickness all the way around the frame, as shown in Fig. 6. The glass is then placed on to the bottom part of the frame (Fig. 7), pressed in closely, and pushed into place, pressing it all round the edges into close contact with the putty. It may be further secured with the aid of a few brads driven into the framework with the heads just touching the glass. A pellet of putty is then pressed into the corners between the glass and the frame, and consolidated by forcing it hard up against the two with the aid of a putty-knife.

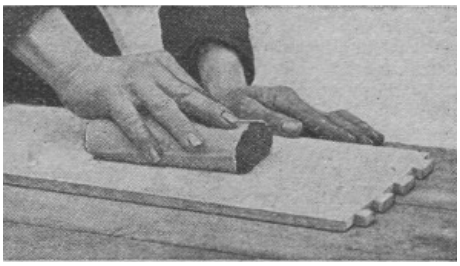
The remainder of the rebate is then filled, and to get a neat finish the knife is used with long sweeping strokes, if possible from end to end of the window, held at an angle to the glass, and with the blade flat on the edge of the frame, to act as a guide for the knife. This

should remove any surplus putty. The inside of the frame should be inspected, and all surplus putty should be removed with the putty-knife or glazing knife. This latter is somewhat thicker in the blade, but otherwise similar in shape to a putty-knife. Any surplus putty adhering to the glass or the frame must be scraped off, the whole dusted over and the glass left clean.

In fitting glass to new woodwork, the latter must be painted prior to applying the putty, or the putty will be liable to flake and fall out soon after it has set hard. In the case of a repair, the putty should be painted to match the existing woodwork as soon as it is dry, say 24 hours or so after its application. Where the glass has to be fitted to a frame and secured by a bead, the same proceeding is followed except that the putty is often omitted. The edge of the glass should be painted a dull black before inserting it into the frame.

Metal framed windows are glazed and treated in the same way as those with wooden frames.

GLASS PAPER: How to Use. Sheets of paper covered with glue and coated with powdered glass, sand or other abrasive are known as glass paper, or sand paper. They are made in many grades, the finest ranging from No. 0 to F2, medium No. M2 to S2, and the coarsest No. 2 1/2 to No. 3. Glass paper is used to work up a smooth surface on woodwork, and to assist in the shaping of curved surfaces; as for example when making a handrail, the top is rounded off by the plane, and the flats or ridges rubhed down with glass paper. Painted surfaces are prepared with glass paper prior to the application of fresh paint, as well as between each coat of paint. Glass paper is employed for some of the finishing processes in leather work and also on fibre, or any other material of a similar nature.



Glass Paper. How to use a rubber of glass paper.

In using glass paper, a piece of suitable size should be cut neatly to shape and folded round a block of cork, wood or other suitable material. The ordinary block is a flat piece of cork about 1 in. thick, 5 in. long, and 3 in. wide. The proper method of use on a flat surface is shown in the illustration, the movement of the hand being in a series of circles combined with a forward motion, the result being that it traverses the whole surface.

For finer work the rubbing is in a straight line with the grain of the wood, as, although the action of rubbing across the grain tends to produce a true surface, the scratch marks are more pronounced. For curved work the rubber may be hollow or otherwise shaped to assist in producing the desired shape as quickly as possible. When glass paper has to be used on small holes, it should be wrapped round a circular piece of wood, a lead pencil, or the blade of a gouge.

The best grade of paper to use on any particular job will depend upon the style of finish and the nature of the material; but in general a rough grade such as No. 1 1/2 or 2 will be used to commence with, following this with a medium grade like No. M2, and finishing with the finest. It should be noted that a worn piece of paper is better to use than a new piece, as it does not scratch so deeply and produces a better result, being more mellow and pliable and not so harsh in action. Worn paper is always to be preferred for rubbing down coats of paint or varnish.

GLASS WARE: FOR USE AND ORNAMENT
Beautiful Antique and Modern Household Pieces

This article first deals with collecting glass as a hobby, then with modern household sets and pieces, followed by a section on the care and repair of glass, and finally with detailed instructions for painting on glass. The entries on separate articles such as Decanter; Finger Bowl; Vase; Wineglass, should be consulted, and also those on Flowers; Table Laying.

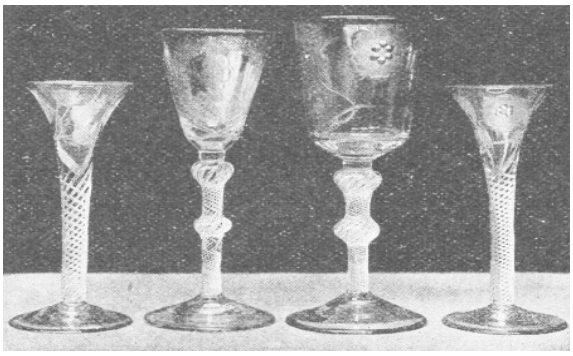
The glasses used in the 17th century were light and thin, never quite pure white nor of brilliant lustre. They were mainly either of Venetian make adapted to English patterns or were made in England by Venetian workers or under Venetian influences. Towards the end of the century the English makers discovered or introduced a stronger kind of glass.

In the early part of the 18th century, glasses with narrow funnels and bowls with round bases were in use. These were succeeded by pieces with drawn trumpet shaped bowls and thinnish stems, and a little later appeared the glass with a plain bowl on a straight stem, which stem soon became quite a long one. These long-stemmed glasses, made sometimes with one small knop in the stem, appear to have been the commonest type for tavern use during the second half of the 18th century, although those with wide funnels were employed side by side with them. A knop is a rounded protuberance.

There were other kinds of glass that have value or interest for the collector. Prominent among such is glass made especially for the Jacobites after 1688 and during the 18th century, used for drinking at their gatherings. Examples of these are shown in Fig. 1. Most of these glasses are engraved, the engraving taking the form of reference to the Stuart family; for instance, the word Fiat, and various emblems such as the star, the rose with two buds, the oak leaf, and the thistle, associated with the royal exiles.

Of kindred origin are the glasses made in honour of William III and the battle of the Boyne. These date mainly from the middle of the 18th century, but were reproduced after that time. The earliest of them are decorated with a portrait of the king, either as a bust or as a full figure on horseback. Other glasses are adorned with the words of a toast in honour of King

William, words of contempt for his enemies being added in some cases.



Glass Ware. Fig. 1. Jacobite Glass. Those at either end are engraved with a rose and rosebuds, emblematic of the Stuart cause, with oak leaf at back and motto Fiat. Centre-right, also engraved with rose and rosebuds. Centre-left, engraved with picture of the Young Pretender encircled with a laurel wreath, while behind are roses, a thistle and a star. (By permission of the Director. Victoria and Albert Museum, S. Kensington)

In addition to these there are a number of special glasses that appeal to collectors, on account of their beauty or rarity, or both. Prominent among these are the ale glasses which were used for drinking ale or beer in the 17th century. One variety had very wide-mouthed funnels, ribbed or plain, with short stems and large conical feet with wilted edges. Others took the form of goblets on shortish stems; these were of ribbed or plain glass, with square bases to the bowls. Some of them, it is interesting to learn, were provided with lids, the reason being that in those days beer was often drunk when hot. The ordinary ale glass held rather less than half a pint, but some were larger.

Cider glasses, which came into use in the middle of the 18th century, are very rare, and therefore good specimens are valuable. The bowls of these are usually straight sided, almost rectangular in shape. Some of them are finely engraved, the design shown being usually apples, apple-trees, or cider barrels. Their size varied considerably. Mead glasses are equally rare. Here the bowl is generally incurved and it stands on a short, strong stem. They were usually made in coloured glass.

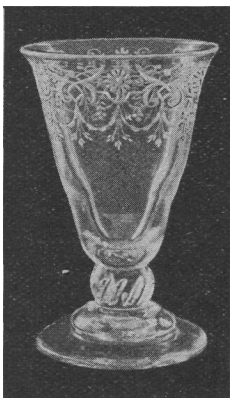
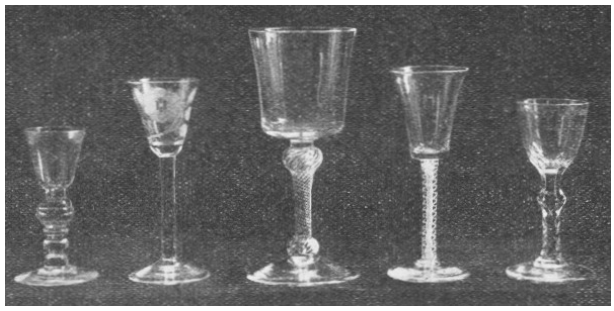


Fig. 2. Hogarth Glass. Eighteenth century trumpet shape glass with buttonlike stem.

Another special kind of glass was introduced about 1700 to hold punch. The earliest used for this purpose appear to have been narrow funnel glasses with a slight collar. Afterwards stemless glasses of the type immortalized by Hogarth and named after him were used for this drink *(see* Fig. 2). Later, tall glasses with extremely small bowls and thin stems came into use for punch, and these remained in favour until nearly the end of the 18th century.

The art of glass cutting, rarely practised before 1740, was brought from London to Stourbridge about 1743, where glass melting had been established a century earlier by French Huguenots. Here it quickly developed the distinctive artistry for which British glass is renowned. The peculiar quality of the metal (as glass-making material is called) was due to oxide of lead instead of lime. Lead used in the correct percentage imparts a much greater brilliance to the glass by improving the colour purity and increasing the light refraction. In old Irish glass the large percentage of lead oxide was responsible for the bluish tint and metallic lustre, which, though admired and sought after to-day, was reckoned by the makers to be a fault.

Wine Glasses. The five main periods in the history of English wine glasses are illustrated in Fig 3: baluster stems dating from 1680; the simpler knopped and plain stems from 1730; the transparent air twists in their many artistic and diverse variations starting about 1740 and extending to 1760-1770, the opaque white spiral stems from 1750-1760: and lastly the cut or faceted stems, early examples of which are occasionally met with, but which generally were not in vogue until 1780. These extended to 1800 and a little later, glasses made after this date ceasing to be of interest to the collector proper.

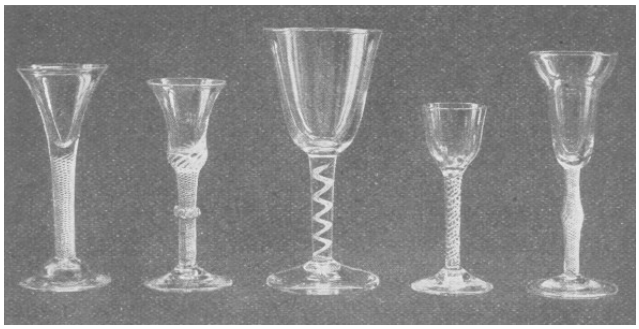


Glass Ware. Fig. 3. Specimens of five main periods of English drinking glasses. Left to right: 1. Baluster stem. 2. Plain stem. 3. Air twist. 4. Enamel or opaque twist. 5. Faceted stem. (Courtesy of Cecil Davis)

The five main types of bowls found in wine glasses are shown in Fig. 4. They are drawn trumpet; bell; straight sided; ogee; and double ogee. Changes in these shapes frequently occur, and Fig. 5 illustrates six examples of Georgian variations of the main types.

A good plan in collecting is to commence by getting typical examples of the various periods. When each main period is illustrated, progress can be made by representing each characteristic shape in the bowl of the glass. Endless forms of specialization will suggest themselves. If it is out of the question to excel in each section, much pleasure can be obtained by taking a certain type, such as double ogee glasses, and by paying special attention to the particular form, and embracing every opportunity of adding specimens that show some different feature, in time a section may be completed illustrating the evolution of the type from its earliest inception.

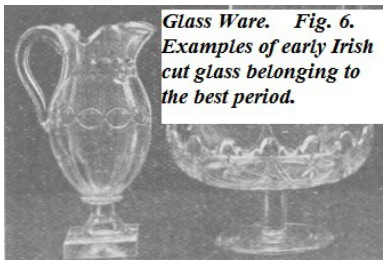
A collection of the many varieties of the opaque twist wine glasses is an interesting pursuit. Combinations of these stems are very numerous, many of which are of great beauty in their film-like threads. Duplicates should be avoided, and it is nearly always necessary to conduct a weeding-out operation as experience shows the weak points of some of the earlier purchases.



Glass Ware. Fig. 4. Five main types of bowls. Left to right:1. Drawn Trumpet. 2. Bell. 3. Straight-sided. 4. Ogee. 5. Double ogee. No. 1 also illustrates the domed foot and No. 5 the folded foot. (Courtesy of Cecil Davis)



Fig. 5. Six specimens from sets of Georgian wine glasses, showing examples of plain and faceted stems and varied types of bowls.



Glass Ware. Fig. 6. Examples of early Irish cut glass belonging to the best period.



Old Irish Glass. About 1770 the Irish specimens of steel-blue metal so much sought after were made, and this represents the finest period in cut glass. Stately chandeliers and table candelabra made their appearance about this time, and these, with the salad or fruit bowls, constitute the rare specimens. Fig. 6 shows two fruit bowls, with pedestal bases, that on the right being of the elegant boat shape. The jug with its square foot is also of beautiful Irish cut glass. The square foot came into fashion about 1780.

It must be borne in mind that the Irish makers were endeavouring to get rid of the fine bluish metal that collectors of to-day eagerly seek, and to substitute white metal of greater brilliancy. This they succeeded in doing about 1815, when the glittering step-cut pieces were first made. This glass was almost metallic in its brilliance, and the object of this manner of cutting may have been to simulate silverware on the table. After this date, English and Irish metal and designs are very similar, and it is impossible to assert definitely the nationality of such pieces. The tendency was to increase the detail of cutting. Thus the bolder diamond cutting gave place to strawberry diamonds and fine and close cutting, as shown in Fig. 7. In 1850 glass had to a great extent lost its simplicity of outline, and in the Great Exhibition held in London in 1851 the glass wares of Bohemia and the European Continent were closely copied in a style lacking in artistic insight.

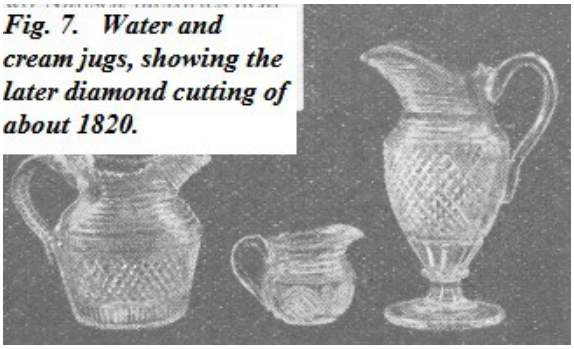


Fig. 7. Water and cream jugs, showing the later diamond cutting of about 1820.

With regard to the early pieces, great care has to be exercised, for even in the early days continental copies of fine Irish glass were made, and they are still copied, and sent over to trap the unwary. The early factories copied each other, and, except for the rare examples that are impressed on the base with the name of the maker and factory, no one is able to assert positively the source of production.

Old Coloured Glass. Amongst other varieties of old glass, the self-coloured Bristol blue, amber, and purple glass commends itself to some, as well as the many shapes in small early cream jugs, bowls, etc. Freak pieces in the shape of boots, hats, bellows, weather glasses, miniature animals, puzzle glasses, etc., appeal to those who wish to collect curiosities. The splashed and striped Nailsea is of interest to those who like colour, and a cabinet of the quaint wine flasks makes a room gay even on a dull November day, for the blues, pinks, and purples are of the brightest. The two Nailsea factories near Bristol were famous for bottles, jugs and crown window glass. They are not recorded to have made flint glass at Nailsea.

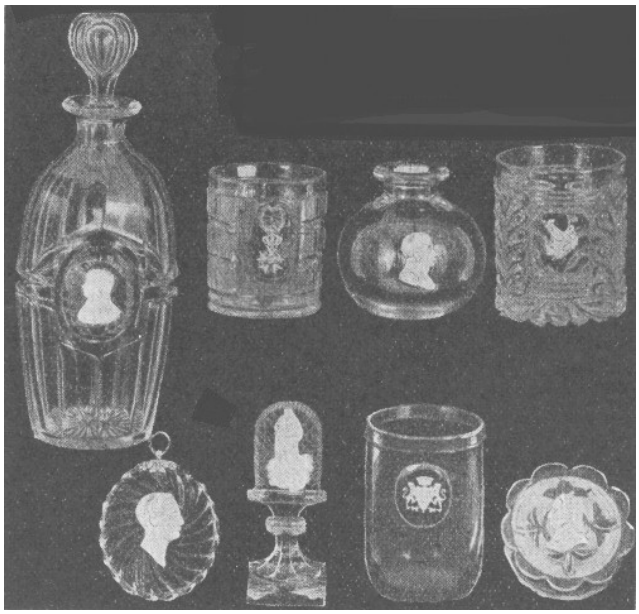


Fig. 8. Bristol opaque glass candlestick enamelled in colours.

The beautiful opaque white Bristol glass of early period is made of such density that at first sight one imagines the piece to be of porcelain. An example of a candlestick is shown in Fig. 8. The finest specimens are decorated in the Chinese fashion with figures, flowers, etc., in brilliant enamels reminiscent of oriental art. Millefiori glass paperweights are a study in themselves. The rare ones are the dated examples. The dates invariably found are 1847, 1848, and 1849, and these

particular examples show quaint animal decorations. These were made at Bristol, and many artistic specimens in festooned patterns of great variety occur. Larger specimens showing less originality of design were made at Stourbridge, as were also ink-bottles.

Cameo Glass. Another variety of glass which is increasingly popular is the cameo glass, invented in England by Apsley Pellatt in 1819. Portraits and other decorations composed of china clay are encrusted in panels, on the sides and in the interiors of decanters, vases, plaques, etc., and these medallions present a brilliant surface, which is, moreover, impervious to the effects of age and wear. A selection of these pieces is shown in Fig. 9. Similar cameo pieces were made in contemporary times by the French and Bohemians, but the English specimens are the finer in quality, and with their silvery appearance at once attract attention; the larger and more important specimens of these are usually of English make.



Glass Ware. Fig. 9. Examples of the Apsley Pellatt cameo-incrusted glass. Top row, left to right: 1. Cut-glass spirit decanter and stopper with white cameo portrait of Robert Burns. 2. Cut-glass tumbler with inset of French Legion of Honour in coloured enamels. 3. Plain glass scent bottle with portrait of George III. 4. Moulded glass tumbler with inset of cock in coloured enamels. Bottom row, left to right: 1. Cut-glass plaque with portrait inset. 2. Cut-glass paper-weight with white cameo inset of Madonna and Child. 3. Ruby glass tumbler with white armorial inset. 4. Cut-glass patch box with portrait inset. (Courtesy of Cecil Davis)

French examples of the Legion of Honour and other Orders are to be found in enamelled colours encrusted in the glass in the same manner.

Modern Glass. For the household quite inexpensive modern glass can be ornamental as well as useful. This applies to carafes, tumblers, jugs and fruit dishes and also to oven ware, which is made in good shapes and looks attractive on the luncheon or dinner table. With sunk handles in the lids, to save oven space, a variety of sizes and a guarantee of two years these glass casseroles and entrée dishes are becoming very popular.

Sets of table glass vary in size, but are usually made for six or twelve persons. The ordinary set will consist of tumblers, five kinds of wine glasses for sherry, claret, hock, champagne, and port, liqueur glasses, and finger bowls. In addition, decanters, two or four, may be included, and smaller ones for liqueurs. Some sets include custard glasses, a pickle jar, honey jar, salad bowl, celery glass, grapefruit glasses, water jug, and ice plates, while others may consist of fewer pieces, the types of wine glass being perhaps reduced to three. The liqueur glasses and decanters are often distinct from the other table glass.

Sets of six coloured tumblers with jug to match are obtainable for lemonade, and many charming designs are to be had in cocktail shakers and glasses. Venetian glass is also attractive for dessert use. Crystal flower vases and dishes always look beautiful on the table. Cut glass does not lend itself to idle ornament. It looks far better in use, and very good effects are obtained by substituting glass for silver or china dishes on a well-polished dining table or fine white cloth. Some beautiful cut glass pieces of a modern table service are shown in Fig. 10. Good cut glass gives forth a clear ringing sound when tapped.



Glass Ware. Fig. 10. Some beautiful pieces of modern English hand-cut crystal table service. (Courtesy of Webb & Corbett)

When buying coloured table glass in separate lots, but for use together, care should be taken that the pieces chosen are of the same tone. Opaque coloured glass is made in brilliant colours, but lacks some of the decorative quality of the clear metal. Black glass for candlesticks and dessert dishes looks effective on certain tables of modern type, while the Georgian styles of water and wine glasses in hand-cut crystal clear glass harmonize well when used with reproductions of Chelsea, Worcester and Spode china. Whole sets of glasses from large goblets to liqueurs are reproduced in the Georgian styles of the two examples

seen respectively on the extreme left and right of Fig. 5. Champagne glasses are frequently made in these shapes instead of in the former shallow style. Practical consideration is shown in making stems of strong design.

Caring for Glass. To clean glass it should be washed in warm, soapy water, rinsed in cold water, and left to drain before being dried and polished with a special cloth. For cleaning glass water bottles and flower vases, a tablespoonful each of vinegar and salt and some warm water may be used. The bottle or vase should be allowed to stand for some hours, shaken occasionally, and finally rinsed with cold water. Crushed egg-shells and a little shredded soap may also be used. Cut-glass which has become very dirty is best washed in warm, soapy water to which a few drops of ammonia have been added, and then scrubbed with a small brush. If washing blue is added to the water it gives to glass a brilliant sparkle. Linen is the best material to use for a glass cloth, though any smooth and absorbent cotton fabric will do for this purpose. A glass cloth is quite useless for polishing purposes once it gets damp.

To prevent breakage when pouring hot liquid into a glass jug or other vessel, put in a spoon or heat the glass beforehand.

When glass dishes, salad bowls, wine glasses, vases, etc., get broken, they should be mended without delay. If the pieces are left to lie about for some time, the edges become chipped and damaged, and it is very difficult to mend them satisfactorily. The broken surfaces should be carefully washed and dried, and the pieces placed in a cool oven or before the fire, so that they will be dry and hot before they are cemented.

In the case of a vase that is washed only occasionally, or wine glasses or salad bowls that can be washed in cold water, any china cement can be used for mending; but if the article has to be placed in boiling or very hot water, the only possible cement is that made with white lead or flake white, which is white lead in a pure and grit-free form. This cement is not affected by water, either hot or cold, or by changes of temperature. The white lead is obtainable at any oil and colour shop, and the flake white from an artist's colourman.

The lead is spread evenly over the broken surface in order to cover every angle and crevice. The two surfaces are then pressed firmly together, squeezing out any excess cement. The more thoroughly this is done the less the line of repair shows on drying. Only a very fine film of cement should be left, just sufficient to hold the pieces together. Any excess must be removed before it hardens.

Two other cements are useful, but they will not stand very hot water. One is composed of a little white of egg mixed with enough plaster of Paris to make a thin cream, and spread on the broken surfaces before it can harden. Another cement consists of 1 oz. of gum acacia dissolved in water, strained, and mixed with as much plaster of Paris as will make a thin cream. Both these cements must be sparingly used, and well pressed out when the broken surfaces are joined together. The mended article must be put in a safe place for the cement to set, two or three days being allowed for the completion of the process. Sometimes the weight of the broken pieces of glass keeps them in position. Failing this, two or three elastic bands can be used, and the article tied up with tape.

Painting on Glass Ware. Painting on glass is a hobby in which artistic training is not necessary, though where talent is possessed it can be well employed by originating beautiful designs. Fig. 11 shows a lovely example of a Persian beaker dating from the 14th century. Such oriental birds can be copied, or form the inspiration for some beautiful modern designs. Vases, flower bowls, dessert services, cocktail sets, and similar articles can be ornamented according to individual taste in designs.



Fig. 11. Persian glass beaker dating from the 14th century, decorated with paintings in Oriental designs. (From the Eumorfopoulos Collection)

If the articles to be decorated are chosen with fairly large openings, a pattern or design, a picture or drawing cut from a magazine, etc., can easily be inserted and pasted or even held on the inside, and the outline copied on the outside of the glass. Designs may be traced from copies on to tracing paper and affixed to the back of the glass, as shown in Fig. 12. The body of the design can be filled in according to personal taste and the colour scheme desired. The copy is washed off after the painting has been completed. In all cases the surface to be painted must first be cleansed thoroughly to remove any possible traces of grease. This can be done by washing it in warm soapy water and, after rinsing in cold water and drying, by lightly sponging with methylated spirit and allowing to stand for a few minutes. Many plain glass articles can be purchased at a sixpenny store. These will serve to make experiments on with various designs and methods of colouring. Glass painting colours and brushes can be obtained at a good artists' colourman.



Glass Ware: decoration by painting. Fig. 12. The plate is painted on its underside and the sundae glass on its outer surface, a transfer being pasted on the other side of the glass and the design traced with a fine brush.

No other preparation of the surface is necessary, and the colours are supplied in bottles or tubes ready mixed for direct application. These colours possess great

brilliancy and, at the same time, a high degree of transparency. Very little colour need be used to obtain the best results. The design is outlined in black first before filling in with the flat colours.

A No. l sable hair brush should be used for this. The colouring may be executed with a No. 3 squirrel hair brush. Where shading is necessary, the colour must be put on quickly. The paler shades are applied first, the darker being superimposed before the first colour is dry. Articles painted in this method dry almost immediately, and can be washed after a few days in warm water and a mild soap without harm. Soda must not be used.

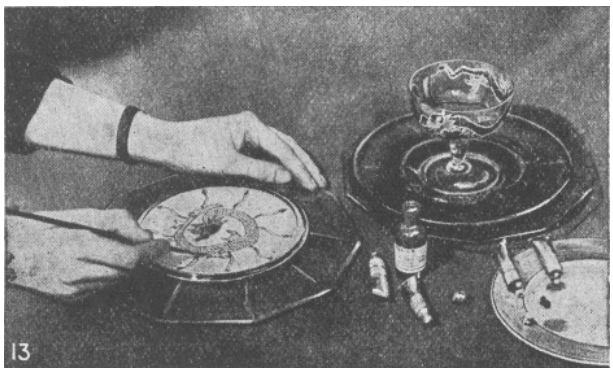


Fig. 13. The finished articles, the designs being outlined in pale green and filled in with blue, green, and a little red for the dragon's head.

Should the first colour be allowed to dry, a hard line results. It is better to finish off a bird, animal, or flower separately rather than try to do a group at once. Simple designs are best, as there is less chance of overcrowding the effect. The colours should be lightly put on, or the transparent effect will be marred. A speck of dust or hair from a brush will spoil the work unless removed instantly with the point of a pin.

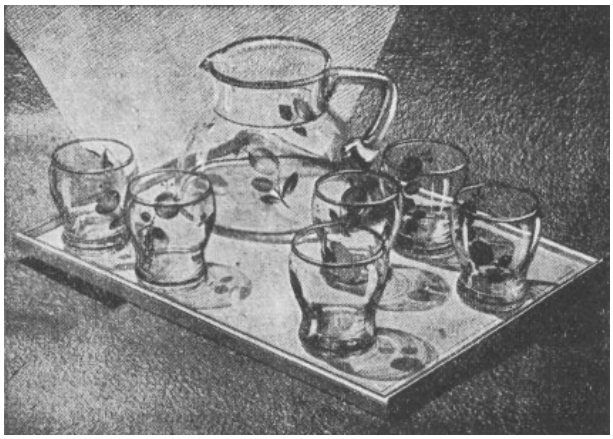


Fig. 14. Simple design of lemons and green leaves for a lemonade set.

A very simple form of glass painting without brushes, which can be done by children and is a delightful indoor pastime, is executed with an Instanta outfit consisting of tubes of colours and rubber stamps with different designs. The latter are charged with colour and pressed on to the glass object which it is wished to decorate. Flowers and leaves can be arranged to form groups or borders.

GLAUBER'S SALTS. The chief constituent of many of the aperient natural waters is sodium sulphate or Glauber's salts. They form a useful purgative for chronic constipation, particularly in persons of a gouty tendency, being taken in a small glass of warm water before breakfast. Glauber's salts are often prescribed as a purgative for sufferers from liver troubles, particularly gall-stones. The dose is ½ to 2 drams, where repeated doses are to be taken; ¼ to ½ oz. when prescribed as a single dose. Effervescent sodium sulphate may be taken in doses of 60 gr. or more.

GLAUCOMA. Commonest after middle-age, this disease is one in which the natural fluid within the eye accumulates, raising the intra-ocular tension and so stretching the coats of the eye. The disease may come on gradually, without pain, but with a loss of visional acuteness. On the other hand glaucoma may be found as an acute condition. Warning may be given of its imminence by a rapid loss of power to read small type, and by the appearance of coloured halos round lights, combined with dimness of vision. An immediate operation is necessary. *See* Eye.

GLAZE. Meat glaze is very strong meat stock, boiled down until it resembles melted glue. It is used when rewarmed to give a shiny and savoury exterior to galantines, cold roast poultry or game, or to brush over raised pies. A small piece of glaze added to soups and sauces adds greatly to their colour and flavour. If stored in pots and kept in a dry cool place, glaze will keep for long, though an equally good way of preserving it consists of pouring a little warmed clarified butter or mutton fat on the surface and allowing it to set. To prepare glaze, put the strained stock into a saucepan, and boil it quickly till only about a quarter of it is left. In the meantime keep it well skimmed. When it has cooled slightly, pour the glue-like liquid into a clean pot and leave it till it is cold and hard. Eight quarts of stock will yield about ½ pint of glaze.

Glaze for Vienna bread is made by boiling about ½ gill of milk with a piece of butter the size of a walnut. This liquid is then brushed over the bread and dried off for a moment in the oven. Sugar-glaze for buns, etc., is made by boiling 1 tablespoonful of white sugar with 3 tablespoonfuls of water for 2 or 3 min. It should then be brushed over the baked buns and dried off in the oven.

To make egg glaze for pies, sausage rolls, meat patties, etc., beat a raw egg well, add 3 teaspoonfuls of cold water or milk, and brush over the surface of the pastry before baking it. *See* Bread; Galantine, etc.

GLAZING: In Upholstery. Glaze of the right kind helps to prolong the life of certain fabrics, e.g. chintz and window blinds, by reducing their liability to

hold dirt, thereby avoiding frequent washing. Glazing stiffens chintz, and is effected in course of manufacture by the use of heavy calendar rollers under a pressure of many tons.

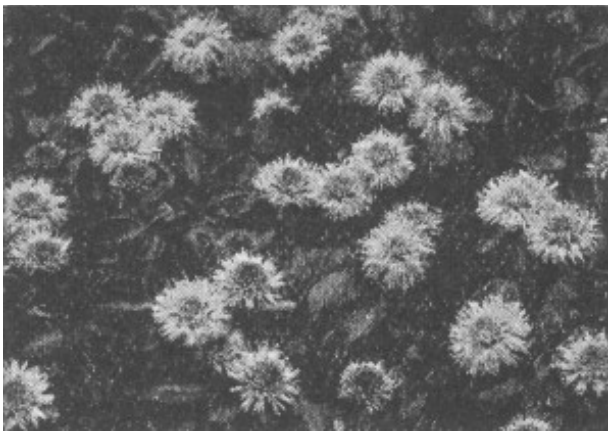
Machines fitted with a flint polishing tool are used by dry-cleaning firms to rub a polish on loose chair covers. To apply similar pressure by hand would be exceedingly laborious; the more practical method is to use heavy, heated irons, after starching the material with the addition of starch glaze. The latter can be made with three parts paraffin wax and two parts stearin, melted together, and this is boiled in with the starch, or applied lightly to the article with a cloth before starching.

Glaze that is produced solely by heat and pressure without the aid of starch disappears on exposure to moist air.

GLOBE AMARANTH. A half hardy annual with "everlasting" flowers of various colours, most suitable for cultivation in pots in the greenhouse. The botanical name is gomphrena globosa. Seeds are sown in warmth under glass in February-March; the seedlings are potted singly in small pots and subsequently into others 5 inches wide in a compost of loam, leaf-mould and sand. If the flowers are cut before fully open they last well and are useful for vases indoors in winter.

Globe Artichoke. *See* Artichoke.

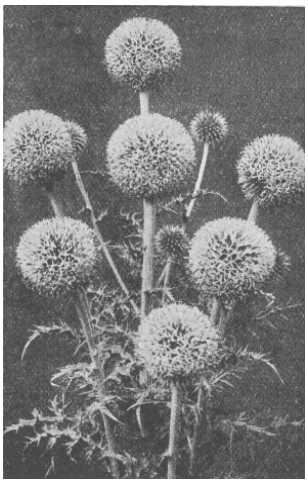
GLOBE DAISY. Known botanically as Globularia, this small genus of shrubs and herbs is suitable for the border and the rock garden in light loamy soil. The species usually grown are cordifolia, a trailing dwarf shrub; nana, a low trailer; nudicaulis, herbaceous, 6 in. high (alba, a white variety); and trichosantha, glaucous, 6 in. high, herbaceous. All have rounded heads of blue or purple-blue flowers. Propagation is by division in September or by sowing seeds in a frame in spring. *See* illus. below.



Globe Daisy. Blue flowers of one of the varieties suitable for the rock garden.

Globe Flower. *See* Trollius.

GLOBE THISTLE. This is an attractive hardy plant with grey-green spiny leaves and round heads of thistle-like summer flowers of a shade of blue. They are easily grown in ordinary soil in a sunny position. One of the best is Echinops ritro, 3 feet high. The globe thistles are increased by division and by root cuttings in autumn or by sowing seeds out of doors in April.



Globe Thistle. Blue flowers and grey-green leaves of Echinops ritro, a favourite herbaceous border plant.

GLORIOSA. This genus consists of handsome hothouse bulbous plants belonging to the order Liliaceae. The best and most noteworthy, G. superba, known as the Malabar glory lily, is a very showy climbing plant which bears orange-red flowers in summer. The bulbs are planted in spring in large pots filled with a compost of loam, peat, and sand. Warm, moist conditions are necessary to encourage free growth. As the leaves fall, watering must be discontinued gradually; in winter the soil should be kept dry. Propagation is by seeds or by removing small offset bulbs. *See* Bulb; Flower Garden.

Glory of the Snow. This is another name which is given to the flowering bulb known as chionodoxa (q.v.).

GLORY PEA. Also known as clianthus or the parrot beak flower, the glory pea thrives under cold greenhouse treatment in a compost of loam, peat and sand, and is useful as a basket plant. Dampieri, the best known species, may be raised from seed or cuttings under glass in spring. It is not an easy plant to manage. Puniceus, which bears crimson blooms, is also very showy. It is nearly hardy, but the best results are generally obtained when it is protected by glass.

GLOUCESTER CHEESE. Gloucester cheese, one of the principal British varieties, is milder than Cheshire cheese and for toasting purposes is one of the best. In shape flat and circular, it weighs from about 22 lb. upward. Double Gloucester is made of the whole milk; single Gloucester is made of skimmed milk, or milk deprived of half its cream. *See* Cheese.

GLOUCESTER PUDDING. These little batter puddings are made by creaming together ¼ lb. each of butter and sugar and two eggs. To these ingredients add 5 or 6 blanched and pounded bitter almonds and 3 ½-4 oz. of fine flour. Beat all to a light batter; then pour it into some cups, half filling them, and bake the puddings in a good oven for about 25 min. They should be served with a sauce made thus: Melt a lump of

butter about the size of a small egg in a saucepan over the fire, mixing in smoothly half a tablespoonful of flour. Move the pan to the side of the fire before adding a little less than a breakfastcupful of water; then replace it, and stir its contents until they are boiling. Put in a heaped tablespoonful of sugar and ½ gill or a little more sherry, and continue boiling for a few minutes before serving.

GLOVES: FOR MEN, WOMEN AND CHILDREN
How to Choose, Repair and Make Them

In conjunction with this article, such entries as Chamois Leather; Dry Cleaning; Knitting; Leather; Mending may usefully be consulted.

Leather gloves are made from a variety of skins, including kid, goat, sheep, lamb, reindeer, antelope, etc. Kid skin finished on the hair or grain side is known as dressed kid, and that finished on the flesh side is called undressed kid. Cape gloves was a term at one time applied exclusively to articles made from skins imported from South Africa, but it is now generally applied to all gloves with a nappa finish. Suède is leather dressed on the flesh side, and mocha is a finish imparted to the hair or grain side, the grain being removed. Chamois is a leather usually from a split sheep skin specially dressed with oil, and makes a glove which is comfortable, and economical because of its washing properties.

Men's Gloves. Styles in men's gloves change very little from season to season, and there is little ornamentation. For everyday wear the most useful and economical ones are of suède, chamois, and doeskin. These are, as a rule, fastened with one button or one fastener, and some makes are silk lined. More expensive gloves made in the same styles are of deer-skin, buckskin, reindeer, and similar materials. For winter wear there are deerskin and Cape gloves lined either with wool or fur. Others are of beaver lined with coney. Some have elastic or sac wrists, others fasten with a strap.

For motoring and flying the gauntlet type is favoured. These are of goatskin bark, tan, nutria, coney, and other materials, and are usually lined with wool. Tan of one kind or other is popular, and some have double palm and fingers where the friction of the driving wheel is felt. For country and sports, knitted hunting string or thick cotton gloves are sometimes worn.

In purchasing gloves, attention should be paid to quality as well as price, for a sound glove made from reliable skins, and with the best sewings, cannot be obtained at the price at which many cheap varieties are offered. Inferior gloves may split the first time they are put on.

Women's and Children's Gloves. Fashions in women's gloves change frequently, but usually the alteration is limited to some new form of decoration. White kid gloves, for instance, are sometimes ornamented with stitching in black, while a similar contrast is achieved with white on black or navy blue gloves. Fabric gloves are used for women's and children's wear, made in all colours and varying qualities, the best quality sometimes being hardly distinguishable from suède.

Gloves of this kind are not so warm for children as those of wool, but they wear reasonably well. Mocha suède gloves, plain, fringed or edged with fur, and those of dark-coloured kid, are popular, while for children's sports and school wear woollen gloves are most usual. The mode of fastening women's gloves varies according to whether they are for evening or day wear. Those for the former are usually 12, 16 or 20 button length and are fastened with 3 buttons, while the latter usually have gauntlet or sac wrists with short lengths of elastic on to which the wrist portion of the glove is gathered.

Babies' gloves are knitted so that the fingers are all in one piece and the thumb only is allowed a separate place. This allows free movement of the hands, and also dispenses with the difficulty of making a very small child put his fingers in the right stalls. These gloves are usually worked with a series of holes at the wrist, through which ribbon can be threaded for tying.

Care Of Gloves. When putting on new gloves they should not be pulled violently at the wrists, but worked on gradually finger by finger. A glove stretcher may be used if necessary. In removing the glove the same care should be observed in drawing it off the fingers and thumb, with the use of as little force as possible.

Suède and kid gloves when soiled are best treated with petrol, while stains on silk, woollen or cotton gloves will generally yield to ordinary washing. Petrol cleaning should not be attempted except in the open air or in a room without a fire or other naked light. If the suède gloves are white or of any delicate shade, the petrol should be perfectly clean and not used beforehand for any other purpose. Pour the petrol into two bowls, placing the gloves in the first to soak for a few minutes. Then put them on the hands, and, in the case of long gloves, draw them well up the wrists and arms.

Rub them together as though washing the hands and rub the finger-tips of one hand against the palm of the other. Pay special attention to any badly soiled parts, and when all marks have been removed peel off the gloves, squeeze them well, and then rinse them in the second bowl of petrol. Squeeze out the petrol, pull the gloves gently into shape and hang them up to dry. Dark coloured suède or kid gloves may be cleaned in the same petrol, but dark brown or grey doeskin or reindeer gloves generally require double treatment before they become thoroughly clean.

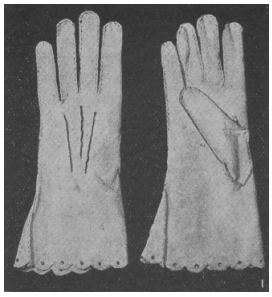
If a dry process is preferred, the gloves should be rubbed with a mixture of equal parts of finely powdered alum and fuller's earth. If, however, they are of white kid or suède, French chalk should be substituted for the fuller's earth. After applying the

powder, leave the gloves for an hour or more, then brush and shake them well. A final application of warm bran or oatmeal should be given. White or light coloured kid gloves may also be cleaned with a piece of soft white india-rubber. Put the gloves on the hands and, commencing with the fingers, rub the leather well with the eraser. If the surface of the rubber becomes dirty in the process, rub it over new blotting paper until it is clean.

When splits occur in kid, suède, or wash-leather gloves, it is useless to stitch the leather together in the usual way, as this will only tighten the skin and cause it to split again. The most satisfactory repair is achieved by working round the hole with a buttonhole stitch, using silk of the same shade as the glove. When this is done, commence a second round, working this time into the loops of the first round of stitches, and continue the operation until the hole is filled. This mend is almost unnoticeable.

Discarded gloves may be worn to protect the hands while housework is in progress, or the fingers may be used as finger stalls in cases of cuts, gatherings, etc. Two pieces of tape should be sewn on to the ends and tied to keep the covering secure. Odd bits of old chamois gloves may be stitched together to form a pad for cleaning silver.

Making Gloves. A glove for placing pieces of coal on the fire can be cut from black velvet or velveteen. To make, place the hand on a piece of paper and draw round it very roughly. A separate thumb covering is allowed, but the fingers are cut in one as for a baby's glove. Allow a generous margin when cutting the material and use one thickness for the back of the glove, and two for the inside. Seam the cut edges together and bind them with tape.



Glove. Fig. 1. Woman's chamois leather gloves of an easy fitting, pull-on shape.

The skin gloves which are illustrated in Fig. 1 are of white washable chamois. The beginner should experiment with an ordinary window leather to get the correct way of cutting and fitting in the thumb and finger gussets.

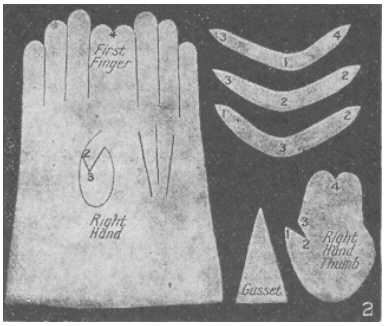


Fig. 2. Outline of patterns needed for the chamois leather gloves.

Besides the skin a leather-cutter's knife is required, a glove needle (which is three-sided), flax thread, and a pattern such as that shown in Fig. 2, which can be cut from a pair of old nappa gloves. Drawing pins with glass or cork heads are also required. A leather-worker's punch is an addition to the set, if it is decided to have a fancy gauntlet. A skin 12 in. wide by 20 in. long will cut a pair of gloves sizes 6½ to 7, and a larger skin that will cut two pairs is an economy, as the gussets can be cut from odd corners. Examine the skin when buying, and see that there are no thin places that will break into holes when worn. Thongs are cut from a round piece of leather in circles and should measure about ⅛ in. wide for glove trimmings.

To cut, place the pattern on the skin in such a position that the stretch of the glove will be across the hand. Fasten the pattern down with drawing pins so that each piece is quite taut, or the skin will move in cutting. There are six pieces, and they should all be placed on the skin before deciding to cut, so that the best position can be judged for cutting without waste, and to get the main part of the glove on the thickest part of the skin, the gussets being cut from the edges of the leather. Cut the straight lines and between the fingers with the knife, but the tips of the fingers and the thumb gusset can be cut more easily with a sharp pair of embroidery scissors. When the six pieces for the right hand are cut, number them as shown.

The stitch used is known as jab-stitch or stabbing, and is worked so that the cut edges of the skin are on the right side of the glove. This makes a strong edge and one that is easy to mend if the thread wears. To jab-stitch, place the two edges of skin together and push the needle right through the two pieces, push back again about ⅛ in. away. This is shown in the illustration (Fig. 7) with the glover's needle in position. Begin to sew at point No. 3, on to 2 and then 1 (Fig. 2), follow right round the thumb and hand, setting this part in very carefully so that there are no puckers on one side, and continue the process right round to point No. 4.

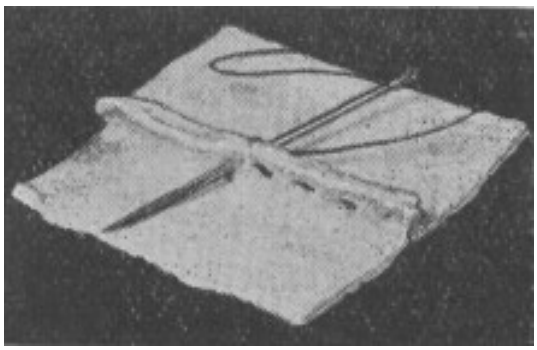


Fig. 7. Stabbing or jabbing stitch used in glove-making.

To sew the first finger begin at the point marked with an asterisk and sew round the curved top. Take the finger strip marked 1 and 2, place this in position so that the outward curve at the centre, which is marked 3, points to the back of the hand and the end marked 1 at the tip of the first finger. It will be noticed that each one of these strips is a different shape, and it is important to number them according to the fingers against which they will fit. In some gloves these

strips are cut straight, with curves at the ends for the tips of the fingers, but the centre curve shown gives a better fit, with much spring and much longer life to the glove.

Sew along both sides of the gusset to the point marked 2, which fits against the top of the middle or second finger. Join the other strips between the second and third and third and fourth fingers in the same manner, the final point, marked 4 coming at the top of the little finger. Now sew down the outside of the little finger, down the side to where the gusset comes in. Place the gusset in position, and sew along one side of that to the palm of the glove, and along the opposite side of the gusset to the back of the glove.

The back of the glove has three very tiny tucks oversewn with black flax thread, or three lines of running-stitches (the centre one longer than the two side ones) can be worked down each of the three strips. Measure off the scallops with a sixpence or other small coin, pencilling round one half of it, and cut out with embroidery scissors, then punch a hole in the centre of each scallop. If a straight edge is preferred, punch holes all round about ¼ in. apart, and thread with thongs of the leather, carrying this decoration right round the glove and up the sides of the gusset. It should be borne in mind that it is not necessary to sew the sides of the gloves below the wrists if it is decided to thong them.

Gauntlet Gloves. In making women's gauntlet gloves, such as those shown in Fig. 3, it is a good plan to cut patterns for two hands, as it is much easier to fit them on the selected skin. Good quality chamois, doeskin, suède, and French gloving suède are all suitable. They vary in price, but home-made gloves are much cheaper than bought ones, and are not difficult to make with some practice if the directions are carefully followed.

Choose a skin of a size that will cut the pattern without much waste. Before putting down the patterns finally, hold the leather up to the light, and mark all tiny holes or thin places with a pencil. Avoid these when cutting out the gloves. The next point is to determine the right way to use the skin. Stretch it carefully in both directions, and arrange that the way which gives the most is across the hand, otherwise the gloves will be tight across the hand and will neither fit nor wear well.

Lay the skin face downward on a hard surface, arrange the patterns, and go round the outside first. Then lift up the fingers, one after the other, so as to mark down the side of the next finger to the one lifted up. Tailor's chalk is best for all dark colours, but for chamois a soft lead pencil may be used.



Fig. 3. Woman's suède gauntlet gloves.

If there is only one pattern, reverse it for the other hand. Always try and get a good piece of skin for the thumbs, and see that the leather stretches across them. Do not forget to reverse the pattern for the second thumb. Fig. 4, shows the shapes of the pieces needed.

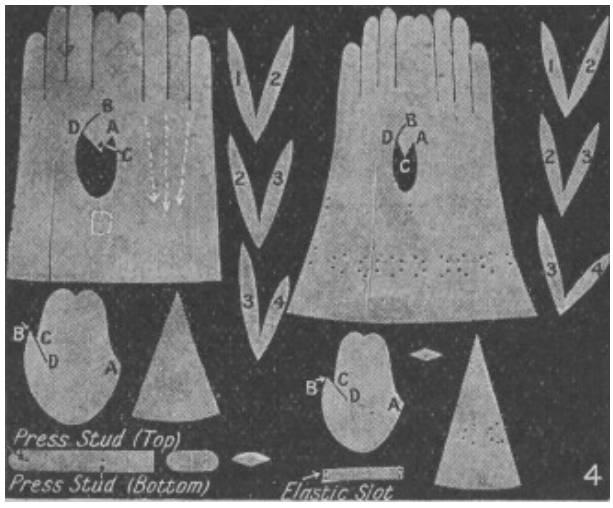


Fig. 4. Right, pattern for making woman's gauntlet gloves; left, similar pattern for man's goatskin gloves shown in the next page.

Three gusset pieces are required for each hand, half a dozen small diamond-shaped gussets for the base of the fingers, and two long gussets for the front of the glove.

Take one thumb, fold the tops together, and stitch, using twist. Follow the directions given in making a man's glove. Stitch in the gusset in the same way, but instead of a strap insert a piece of elastic from 2 dots on the pattern to the corresponding 2 dots. Trim off the top of the glove when the gusset is fixed. Turn up round the bottom about ¼ in., stick it down with a little gum paste, and press it. Then cut holes round the hem thus made, using a thonging punch. Thread some thongs from the same skin, as shown in Fig. 5.

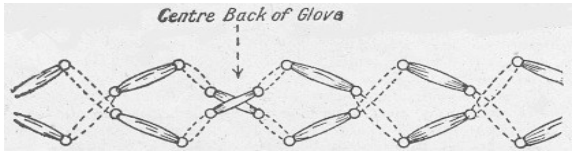


Fig. 5. Thongs for gauntlet glove. Dotted lines show direction of thong on back of skin. This trimming starts in centre of gusset.

Man's Winter Gloves. A pair of man's gloves in goatskin with fur cuffs, size 8, is illustrated in Fig. 6. Cut out as explained for a woman's glove. The pieces needed are shown in Fig. 4, left. The stitching up the back must be done first. This consists of three rows of stab-stitch, below the fingers (Fig. 7).

Fold the leather and commence sewing from the top. The tiny ridge of leather made by sewing the two pieces together must be as small as possible, and the lines must be kept even. The line between the first and second finger should be about 3⅜ in. long, that between the second and third 3½ in., and the last one 3 in. Always avoid unpicking. If the work does not look very flat, press it by leaving it between some books.



Glove. Fig. 6. Men's goatskin gloves, patterns for cutting which are shown in Fig. 4.

Sew up the seam of the thumb as far as the bottom of the short side. Do not fasten off, but leave the thread hanging. Place point C on the glove to point C on the thumb and sew together seam CD. Continue the seam to B, and then on to about 1½ in. down the side of the thumb. Unthread the needle as before. Now thread the needle with the first end left at C, join seam CA and continue 1½ in. down the side of the thumb. Fit the remainder of the thumbhole and thumb by placing the edges together, taking great care not to stretch either edge. Should the thumb seem too large, as is usually the case, trim off the hole, but on no account cut anything off the thumb. Do this very gradually until the thumb fits well. Continue sewing together, and when ready to fasten off pull the loose end through to the back, also the one which is being worked, and tie the ends together.

Sew the small shaped gussets into the bottoms of each pair of finger gussets, taking care that the point comes exactly in the point between them. Then sew the gussets marked 1 and 2 into the glove, the small gusset to be towards the inside of the hand. Begin sewing on the back at the point up the first finger to about 1 in. from the top. Trim off the gusset at the top until it fits the middle of the top of the finger, continue stitching to the end of the seam. Push the needle through the inside to the top of the gusset and stitch the other side down to the base. It is important to make sure that the point O on the pattern comes exactly to the point of the fingers.

Do the other fingers in the same way, but continue down the outer side of the fourth finger about 7 in. Insert the end of the strap fastening between the back and front of the hand. Stitch it to the back, and then continue the seam to the end. Trim off any surplus. Fix the steel bar to the small strap of leather by slipping it over the end and folding the two ends together. Stitch close to the bar and fix it to the glove. Put in the front gusset. Begin sewing at the bottom and work to the point up one side, then from the point to the bottom of the other side. Make the bottom even by turning off any unnecessary pieces of leather.

To put the fur inside the cuffs, cut a piece of fur 3 in. wide and long enough to go round the bottom of the glove, noting that the fur is to brush downward. Place the fur side towards the outside of the glove and stitch firmly all round the edge. Oversew the two ends of the fur together. Turn the top of the glove back sufficiently, so that the fur can be turned over, and slipstitch the other end inside the glove. Do not take the stitches through on the right side. The fixing of the press-studs to the strap remains to be done. Fit the lower half of the stud at the O mark shown on the strap. Then put the strap through the bar and fix the top half to the end of the strap with the top side of the press-stud underneath, so that when the end is brought over to meet the lower half the stud will shut properly.

Be careful to put the strap through the bar before fixing the stud top, as this will not go through afterwards. Use good stout glazed thread or fine twist for sewing, and do not use too long a piece of silk. The edges are put together and sewn with stab-stitch, which is simply pushing the needle down through the two pieces of leather and bringing it up again,, making a tiny stitch. It is not possible to run gloves together.

Knitted Gloves. The pair of man's gloves, one of which is shown in Fig. 8, were knitted with a fairly heavy wool, and are for a size equal to No. 9 in kid. For smaller sizes use No. 13 steel needles instead of those given. The materials required are 4 oz. of 3-ply super wheeling yarn, which is better for warmth, wear and general masculine purposes, and a set of four No. 11 steel knitting needles. Cast 52 stitches on the three needles altogether, in the proportion of 18 on each of two needles and 16 on the third; working in rounds of double rib—that is, knitting two stitches and purling two stitches alternately all round, until 36 rounds are worked for the wrist. Here the hand begins and ten rounds are knitted in plain knitting, after which the gusset for the thumb is begun.

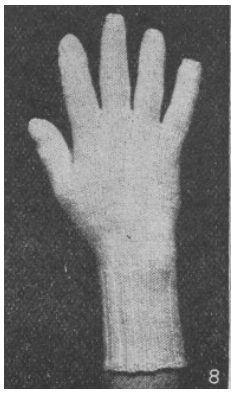


Fig. 8. Knitted glove for a man.

To begin the thumb, purl one stitch, then increase one stitch (by knitting through the loop just underneath the next stitch, then knitting that stitch), knit 2, increase once in the next stitch as before, purl one stitch, and knit to the end of the round. The two purled stitches mark the outside of the thumb. * Knit two rounds in plain knitting, but purling the two stitches that were purled in the previous round. In the next round increase once on the inside of each of the two purled stitches, then knit plain to the end of the round. Repeat from * until there are 20 stitches between the two purled stitches. Knit two more rounds without increasing, then in the next round knit the purled stitch, pass the next 20 stitches on a safety pin, and leave them for the thumb. Cast on five stitches after the last knitted stitch, then follow on the other stitches and finish the round. Work 14 more rounds for the top part of the hand that comes above the thumb.

How to Knit the Fingers

Here the fingers begin. For the first finger take the five stitches cast on at the back of the thumb, two to the left of them and seven to the right, leaving the rest of the hand stitches on a piece of string, with the open ends towards the first finger, in order that the stitches can be slipped off for the succeeding fingers. Cast on six stitches, then on these 20 stitches knit 25 rounds.

Decrease once at the beginning of each needle by knitting together the second and third stitches. Knit three rounds without decreasing, do another decrease round, then three rounds without decreasing, another decrease round and one more round, decreasing one stitch only in the round, when there should be 10 stitches left. Place these so that there are five stitches on each needle, and one needle behind the other, then graft the stitches together as instructed under knitting. Cut off the wool and darn in the end on the wrong side of the glove.

For the middle finger take six stitches from the left end of the string (palm side of the glove), pick up and knit six loops at the bottom of the first finger, then take off and knit seven stitches from the opposite end of the string, which comes at the back of the hand, and cast on four stitches to come between the fingers, making 23 stitches altogether. Knit one round, knitting together the first and second of the six stitches at the bottom of the first finger, and the fifth and sixth of these stitches. On the remaining stitches knit 28 rounds then finish off the top like the first finger, decreasing until there are only 10 stitches left, and graft them together.

For the third finger take six stitches from the palm end of the thread, pick up and knit four loops at the foot of the second finger, take seven stitches from the opposite end of the thread and cast on three stitches, 20 stitches altogether. On these stitches knit 25 rounds, then finish off the top like the first finger. For the little finger take the remaining 13 stitches and pick up four loops at the side of the third finger, making 17 altogether. Knit 20 rounds, and finish off the top like the other fingers.

The thumb can now be finished, so take the stitches off the safety pin and pass them on the needles. Pick up five loops where the stitches were cast on at the back of the thumb, and knit one round on all these stitches. In the next round knit together the second and third of the five cast-on stitches. * Knit one round plain, then decrease again over the two knitted together in the last round, then finish the round. Repeat from * once. On the remaining stitches knit 18 rounds, then finish off the top of the thumb like the fingers.

The left-hand glove is worked exactly the same until the first finger is reached. Here take two stitches to the right of the five cast on behind the thumb, and seven to the left of these stitches. This will reverse the hand, and the rest of the fingers are taken off in the order given for the right hand.

A Baby's Gloves. The knitted gloves shown in Fig. 9 have a thumb piece and the bag shape only for all the fingers.

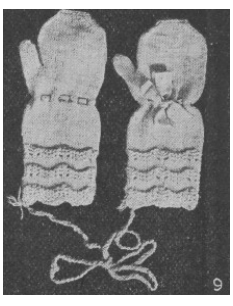


Fig 9. Baby's gloves with crochet chain for securing up the sleeves.

The materials required are 1 oz. of 4-ply Beehive Scotch fingering wool in white and a small quantity, about ¼ oz., of pale blue silversheen for the edge of the wrist and top of bag, and the surplus for the crochet chain. Use No. 10 steel knitting needles, and work at a tension of about 7 stitches to the inch in width; the wrist portion will measure nearly 3½ in. wide when measured flat across the double portion, 3 in. across the palm, and 8 in. long from the wrist to the top of the finger portion. A No. 10 bone crochet hook is also required, and 1 yard of narrow ribbon to match the silversheen.

With the white fingering cast 45 stitches on the three needles in the proportion of 16 on each of two needles and 13 on the third. The 1st round is knitted plain. 2nd round: * purl two stitches together, purl two single stitches, wool round the needle and back to front again to make a stitch, purl 1, wool round the needle, purl 2, purl 2 together; repeat from * all round. There should be five patterns in the round. The 3rd round is knitted plain, and the fourth is similar to the second.

Repeat the third and fourth rounds once, and knit the 7th to llth rounds all plain. Repeat from the second to the llth rounds twice, then knit one round plain, increasing three stitches in the round at equal distances apart by knitting in the front and back of each of three stitches. Work 16 rounds in plain knitting but without any shaping.

In the next round make the ribbon holes for the wrist as follows: * knit one, bring the wool to the front of the needle so that it will pass over the needle when knitting the next stitch, then knit the next two stitches together; repeat from * all round. In the next round the wool that was passed over the needle will be knitted in the ordinary way, thus making a stitch and so forming the hole.

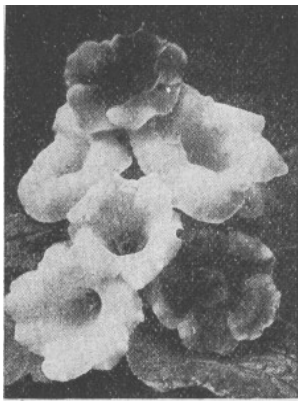
To form the hand, work 12 rounds in plain knitting; then divide the stitches for the thumb as follows: knit the first stitch, slip the next eight stitches on a safety pin, and leave them until the hand is finished; cast on two stitches and knit the rest of the round. Knit 16 rounds on these stitches for the hand, then begin to decrease to shape the top. For the 17th round, knit 1, knit 2 together, knit 15, knit 2 together, knit 2, knit 2 together, knit 15, knit 2 together, knit 1; and for the 18th, knit 1, knit 2 together, knit 13, knit 2 together, knit 2, knit 2 together, knit 13, knit 2 together, knit 1. Continue decreasing in this manner until only 18 stitches remain. Cast off the stitches and, with the silversheen crochet the top together, using a No. 10 bone crochet hook.

The thumb is made by taking up the stitches that were left on the safety pin, dividing them on to two needles, and with a third needle knitting up three stitches under the two cast-on stitches. Work 12 rounds in plain knitting, then knit 2 together until all the stitches are worked off, and with the silver-sheen work 1 double crochet into each stitch at the top of the gauntlet. Work the second mitten exactly the same as the first, as they are interchangeable on each hand.

GLOWWORM. Where the glowworm appears in the garden, usually on a grassy bank, it should be permitted to remain, for as a grub it feeds entirely

upon snails. The male somewhat resembles in form the common wayside beetles known as soldiers and sailors; the wingless female, the chief light giver, differs little in appearance from the grub. As a rule, she climbs a grass stem at night to make her light more visible to the flying male. The latter often flies into open windows where there is a light. Attempts to establish the glowworms in gardens are often made, but are doomed to failure unless the snail pest is already there.

GLOXINIA: How to Grow. With bell like flowers of innumerable colours and shades, the gloxinias are a family of very beautiful greenhouse or stove-flowering plants. They are tuberous perennials, but are usually raised in the first instance from seed. The seed, which is very small, should be sprinkled in well-drained pans or boxes of light, sandy soil with which a little leaf-mould is mixed. January and February are suitable months for sowing.



Gloxinia. Blooms of several varieties of this beautiful greenhouse plant.

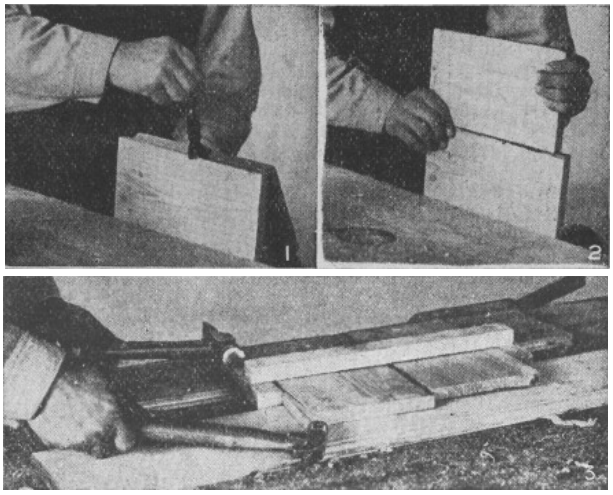
In an ordinary greenhouse heat, say of 55° to 60°, the seed will germinate in less than a month, and as soon as the young plants, which grow rapidly, are large enough to handle they should be pricked out. A change from a 3 in. pot to one of larger size will be all that is required. Ordinary potting soil of loam and leaf-mould will suit them admirably. They will flower in summer.

After the flowers are over gloxinias should be dried off gradually by giving decreased supplies of water and finally keeping the soil dry in winter: the pots containing the roots must remain under the glass safe from frost. In early spring the tubers should be taken out, repotted, and started into fresh growth. Gloxinias must be shaded from strong sunshine. During the summer months they need little or no artificial warmth.

Gloxinia tubers are not much good after the second or third year, but attempts may be made to perpetuate favourite sorts by cutting half-way through the mid-rib of one or more healthy leaves, when the flowering season is over, and pegging them down to a sandy surface-soil with pegs or hairpins. In the course of time tubers will form at the bases of the wounds, and new plants thus procured may be grown in the ordinary way.

GLUCOSE. Grapes and other sweet fruits contain the colourless syrup known as glucose or grape sugar. It is found in the human body, in the blood and lymph, and in medicine it is added to nutrient enemata, being readily absorbed. Glucose is prepared artificially from starch, dextrin and cane-sugar. It is used in brewing, confectionery and jam making. *See* Diet; Food; Jam; Sugar.

GLUE: How to Prepare. Glue is an adhesive preparation, often in the form of impure gelatine, obtained by boiling down animal substances such as skin, horns and hoofs. It is mostly either of the cake type, such as Scotch glue, or purchased in a tube, generally in the form of a patent preparation. Fish glue is sold in convenient form in a tin or tube. Various grades are available. Casein glue employed by bookbinders, is made by dissolving casein in a solution of borax. Dutch, Flanders or Cologne glue is a pale, strong adhesive bleached with chloride of lime. Elastic or flexible glue is obtained by combining glue with a preparation of glycerin, glucose, etc.



Glue. Fig. 1. Applying glue to two surfaces simultaneously. Fig. 2. Rubbing the two edges of joint together. Fig. 3. Cramping up the joint; two hammers are used to drive wedges home.

The preparation of Scotch glue is simple, but unless carried out properly results in partial failure. The glue is purchased in the form of rectangular blocks about 6 in. square, and one of these should be loosely wrapped in a piece of old paper, and broken into small pieces with a hammer. The contents of the paper are placed in the inner vessel of the glue-pot, covered with cold water, and left to soak for 24 hours at least. The glue-pot is then placed on a slow fire, gently brought to boiling point, and left to simmer until its contents are completely dissolved and ready for use.

Glue should be dissolved by gentle heating; if it is allowed to boil for any length of time it will darken, and much of the strength will be lost, and the same applies to reheating. It is, therefore, prudent to mix only such a quantity as will be used up without delay. Never put new glue in a pot containing old hard pieces; the pot should be cleaned out, and fresh glue made as required.

The glueing up of the parts is best carried out in a warm room, the surfaces to be united being warmed, and the adhesive applied sparingly but thoroughly (Fig. 1) to both surfaces. The two parts are pressed gently together, as in Fig. 2, to squeeze out all surplus

glue and exclude air bubbles; the ultimate strength of the joint depending upon the closeness of contact between the two pieces of wood. If this is properly done the joint will never come apart under ordinary uses. Repeated testings have shown that the wood itself will splinter before the joint will give way.

Another point is to provide means for cramping the parts together (Fig. 3), as the joint should be kept in firm contact until the glue sets hard, and 24 hours is none too long for this essential process. In some cases it is necessary to unite pieces of wood in such a manner that they can be parted without difficulty. This is accomplished by placing a piece of thin brown paper between the faces of the wood while the joint is made. When it is to be severed, the paper can be split and the surfaces cleaned up with a plane, and finally glued together. This class of glue-joint is in considerable demand for curved work, when several pieces have to be shaped, and for some reason separated, before the final completion of the work.

When any considerable area has to be covered a short stiff brush may be used, but on delicate work it is better to apply the glue with a thin stick of wood shaved at the ends to form a sort of knife blade.

Patent adhesives, such as the various liquid glues, are convenient for repair work and small jobs, being applied direct to the joint faces. They should be pressed close and cramped, although they set hard in a few hours. Similar remarks apply to most of the fish glues. A glue for metal may be made from fish glue and carefully prepared flour paste in equal proportions.

GLUTEN. When mixed with water gluten has a gluey consistency, from which its name is derived. Gluten or vegetable albumen is one of the constituents of most cereals. It can be obtained by kneading flour with half its weight of water till it is stiff and then continuing the kneading under running water, which washes out the starch.

Wheat flour contains about 12 per cent of gluten, and it is to this quantity together with the elastic nature of gluten in the flour that bread owes much of its light and spongy texture. The grains of other cereals, such as oats, rye, barley, that are deficient in gluten, will not by themselves yield a light, porous loaf. Gluten is sometimes used by itself, or with only a very small quantity of starch, for making gluten bread, or gluten biscuits used in diabetes. *See* Bread; Food.

GLYCERIN. Obtained from fats, glycerin is a colourless, thickish, transparent fluid which readily dissolves other substances, and does not turn rancid or evaporate. Consequently it is often used as a means of applying other drugs to skin surfaces, or mucous membranes. It is also commonly included lor its soothing qualities as an ingredient of throat lotions.

Common glycerin preparations are glycerin of boracic acid, sometimes called boroglyceride, for fomentations; glycerin of alum; glycerin of tannic acid, a useful astringent preparation; glycerin suppositories, etc. A characteristic quality of glycerin is its power of absorbing water from any moist surface with which it comes in contact.

When mixed with an equal part of plain water or rose-water, glycerin forms a good application for chapped hands and helps to keep the skin white and soft. Used pure it is generally too irritating. Perspiring feet may be rubbed with glycerin and then sprinkled with borax with excellent results. Shoes that are to be put away temporarily should be rubbed with a cloth dipped in glycerin. This will make the leather soft and pliable and prevent cracks.

GNAT. The mosquito family of insects are also called gnats. Many species of this family, which breeds on stagnant water, carry malaria, and others carry yellow fever, dengue and filariasis. They are blood-sucking insects and they introduce infection in the act of biting. The common English gnat carries nothing. The irritation following bites may be treated by applying solutions of ammonia, bicarbonate of soda, or permanganate of potash. *See* Mosquito.

GOAT. As a profitable animal costing little to keep, or simply as a children's pet, the goat can be strongly recommended. It can be kept where a cow would starve, and its milk possesses high dietetic qualities. A goat takes up little space, and the stall of a disused stable will accommodate two or three. For breeding purposes a male goat should be hired. Goats first come in season at a few months old, but 18 months is soon enough to put them to a male. To breed from a goat earlier ruins the milk yield.

A goat-keeper, unless he has ample space, should kill the kids when they are born, that is to say, if he keeps a goat for her milk, for the young will take it all; and, unless of very good pedigree, kids do not pay to rear. The flesh in flavour is very like veal. The milk yield of a goat varies greatly. An animal that will give four quarts when in full profit is a remarkably good milker, two quarts being nearer the average. Milking should be done regularly twice a day, and the bag thoroughly stripped.

The best food for goats in winter, when they have to be kept indoors, consists of leaves, grass, vegetables, and a little hay and corn. Out of doors they can subsist on a hedgerow, eating grass and leaves which would otherwise be wasted; and all through the spring and summer, if there is plenty of such food for them, they need not cost a penny for their keep. They should, however, have some concentrated food if they are milking. Anyone owning a heavy milker of a good strain will find it pays to feed the animal well in winter, stall feeding, as for cows, on hay, crushed or whole oats, bran and cracked maize.

A goat can very rarely be allowed its liberty owing to its fondness for barking trees and the inquisitive disposition it manifests towards everything it can reach. It is, therefore, customary to tether it on a rope or chain with a swivel attached to a stout iron pin driven into the ground, moving it to fresh ground every

day, or even several times a day. Goats are very hardy. The only thing likely to upset them is a surfeit of wet greens. They have aversion to damp and heavy winds, and in wet weather should be confined to their stall and given a little hay.

Goat's Milk. Goat's milk is an exceedingly nourishing and valuable food for infants which cannot receive their natural nourishment. Both the protein and the fat are greater than in cow's milk but there is less sugar than in human milk. An important recommendation for goat's milk is that these animals do not suffer from tuberculosis. For very young infants goat's milk is too strong. If given at all it should be well diluted with water. For growing children it is an excellent and nutritious food.

The following notes are taken from Advisory Leaflet No. 118 issued by the Ministry of Agriculture:

Goat's milk is as sweet and palatable as cow's milk, richer in cream, and more easily digested. Butter made from it is white, and may be coloured with annatto. Soft and hard cheeses of excellent quality can be made from the milk. Two points to note in milking are that it should be done at regular intervals and done quickly, as the goat becomes impatient if the operation is delayed. The milk should be strained through a clean butter-cloth and stored in a cool place. All utensils must be kept scrupulously clean by scalding with boiling water, and the hands should always be washed before milking.

Feeding the Goats. For feeding purposes the best receptacle is a metal pail. Variety of food is essential, but there should be no waste. Food of any sort should never be placed on the ground, as the goat will refuse to touch it if it is in the least soiled or tainted. Cabbages and similar green food should be hung up by the roots. Hedge clippings, garden produce of all kinds, acorns, roots, weeds such as dandelions, sow thistles, and docks are all eaten by goats; but everything must be perfectly clean and sweet, or they will reject it. Milking goats may have two or three handfuls of corn or cake daily, and when the lactation period extends through the late autumn or winter months, some concentrated food such as grain, meal, or cake is necessary if a satis-factory milk yield is to be obtained. Mangolds and swedes may be given, cut in half and placed in the manger, or sliced or pulped and sprinkled with bran or middlings. Good, sweet hay should form the staple food for winter.

Dyed goat fur is a cheap and popular substitute for bearskin. It is used largely for trimmings, white Thibet goat providing an attractive decoration for evening wraps and cloaks. *See* Fur.

GOAT MOTH. The caterpillars of the goat-moth bore galleries in the stems of many trees, and render the wood of little or no use for practical purposes. The odour of the caterpillars and their burrows has been compared to that of the goat. The moth, which flies at night, is large and plump, the female being 1½ inches long or more, with saw-like antennae, brown wings mottled with grey and black, whitish rings on the abdomen. The caterpillar measures up to 4 in. in length, and more than 100 have sometimes been taken from one stem.



Goat Moth. The caterpillars attack tree stems by boring, thus rendering the wood useless.

Trees which are badly attacked and are of no great value should be cut down and the larvae destroyed. When a tree is only slightly attacked, or when it is of special value for shade or ornamental purposes, the following methods of destroying the pest are recom-mended for ordinary garden purposes by the Ministry of Agriculture. Small quantities of carbon bisulphide may be injected into the holes in the trunk, or small pieces of potassium or sodium cyanide may be pushed into the holes. Whichever poison is used the holes must be thoroughly blocked with clay immediately after the operation is completed.

Goat's Beard. *See* Spiraea.

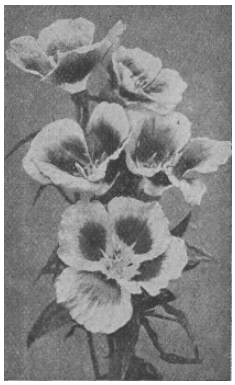
Goat's Rue. This is a variant name for the perennial better known as the galega (q. v.).

GO BANG. This indoor game is played by two or four persons. The requisites are a board marked like a chessboard into 400 squares, 20 along each side, and 400 pieces, each 100 being a different colour. They are divided between the players, each taking 100 or 200 as the case may be. The pieces are all outside the board at the start, and each player in turn puts one on to any square he likes, provided it is unoccupied. The object of the game is to get five pieces in a straight line, straight in any direction, and the player who succeeds in doing this first wins.

A variant of the game is to place the pieces on the board in turn as in the previous game, and to endeavour to surround an opponent's piece with them. The piece which is surrounded is then taken from the board. The game continues until all the pieces have been placed on the board, and the player who has then surrounded the larger number wins. Go Bang is also played on a board of 361 squares, 19 along each side. In this case 362 counters, or men, are used.

GODETIA. One of the most beautiful hardy annuals; seeds are sown out of doors in spring where the plants are to bloom in summer. If sown in pots in September and grown in a slightly heated greenhouse they will flower in spring under glass. There are

innumerable tall and dwarf varieties with single or double flowers. The former are sold chiefly by colour. Of the latter varieties the Azalea-flowered, Lady Albemarle and Duchess of Albany are some of the best for the garden.



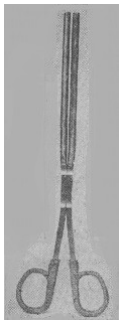
Godetia. Flowers of this easily grown hardy annual.

GODPARENT. Alternatively known as sponsors, these are the persons who, when a child is baptized, make certain promises on its behalf and undertake that it shall be taught the Christian faith. Godparents exist in the Church of England, the Roman Catholic Church ahd the Lutheran Church, but not among the Presbyterians, Wesleyans, and other bodies. The Church of England ordains that each male child shall have at least two godfathers and one godmother, and each female child two godmothers and one godfather.

GOFFERING. This is a laundry process, applied as a finish to lace, cambric, and embroidery frills and producing a fluted effect. It is used mainly for frilled pillowcases and muslin curtains, servants' caps and apron borders.

The goffering irons are made in various sizes for coarse or fine needs, ranging between wide cambric and embroidery frills to tiny Valenciennes or other lace borders gathered, insufficiently full for goffering. The irons must be kept very clean and must not be used too hot. On the other hand, if not hot enough they will not produce the fluting. The temperature should be tested with clean white paper.

In practice one arm of the iron is slipped under the material and the other is brought over the top, pressure and a slight turn to the right producing the required result. Frills that are set in groups of pleats need ironing instead of goffering. *See* Laundry.



Goffering Irons.

GOITRE: Cause and Cure.

Derbyshire neck, or goitre is an enlargement of the thyroid gland. It is commoner among women than among men, and cases have been associated with the drinking of limestone water. The patient should remove to another district if this is feasible. Otherwise all drinking water must be boiled, as the disease is due perhaps to some poison or germ in the water.

The development of a simple goitre has some relation to the supply of iodine to the tissues of the body. The secretion of the thyroid gland contains an organic preparation of iodine, and the most obvious explanation of a simple goitre is that it represents an increased effort to maintain or increase the supply of iodine to the tissues. One method of preventing the disease is to give small doses of iodine regularly. The administration of thyroid extract has proved successful in some cases, but this powerful drug should never be used except under medical observation. See Exophthalmic Goitre; Gland.

GOLD: Marks and Qualities. It is compulsory for certain articles of gold to bear a hall-mark if they are manufactured and offered for sale in the United Kingdom. The chief marks of the Goldsmiths' Hall for gold wares made in England is a lion followed by other letters or marks representing the particular year in which the hall-mark was applied, and the initials or registered trade mark of the firm responsible for the manufacture of the article. The principal marks of the Birmingham Assay Office are an anchor followed by the marks which indicate the quality, the year of manufacture, and the maker.

The different qualities of gold that are hallmarked are 9 carat, 15 carat, and 18 carat. They are distinguished by the figures on the articles, as follows:

18 carat gold	.750
15 carat „	.625
9carat „	.375

The higher qualities of gold are considerably softer, consequently articles which have to withstand hard wear are best made in the lower qualities. A 9 carat or 15 carat gold watch albert will wear considerably longer than one of 18 carat or 22 carat. In regard to gold cigarette cases these will wear better in 9 carat than in 18 carat.

When disposing of old gold it will be found useful in calculating the price per oz, that ought to be obtained to take the average price of gold at 3/6 or 3/9 per carat, and multiply this amount by the quality of the gold, 9 carat, 15 carat, 18 carat, or 22 carat, as the case may be. For example, old 18 carat gold ought to realize 18 times 3/6 or 3/9, according to the market price. A small loss has to be incurred in the melting of old gold by the refiners.

Gold jewelry of the quality 15 carats and upwards will wear a soft yellow colour throughout, but lower qualities are usually gilded. When new, these are the same colour as 15 carat or 18 carat, but after being in wear the gilding will wear off and the gold will have more of a reddish tint or bright copper colour. This is not in any way detrimental, but it frequently causes the

owner to conclude that the article is not real gold. In the alloying of lower qualities of gold the base metal has the effect of making it a reddish yellow colour, and it frequently happens that the colour of 9 carat gold appears like bright copper before it is gilded and polished.

For cleaning gold there is nothing better than a paste of water and ordinary powdered rouge. This is brushed on to the article, or if the ornament has a smooth surface the paste can be applied with an ordinary leather. A bright polish is obtained quickly. If any of the paste remains it can be removed with a damp brush. No moist rouge paste should ever be allowed to come in contact with any stones such as pearls, turquoises, etc., which might be set in an article of jewelry; nor should any water or moisture be applied to any such articles, as this would discolour pearls or turquoises. For cleaning gold, jewelry, or ornaments set with stones other than diamonds, it is essential that a stiff brush with dry powdered chalk should be used. *See* Brooch; Carat; Jewelry; Ring.

GOLDEN BUCK. Cheese and poached eggs are the main ingredients in this American recipe. To make it, put ½ pint of milk into an enamelled saucepan over the fire, and when it boils add ½ lb. of grated cheese, ½ teaspoonful of salt, and ¼ of pepper. Stir the whole until the cheese has melted, and with it coat 6 rounds of hot buttered toast. Place a poached egg on the top of each, dust them with a little pepper, and serve them at once.

GOLDEN DROP. The name of golden drop is borne by a small family of hardy perennials known technically as Onosma. They are excellent for the rock garden in thoroughly drained sandy loam, and may be propagated by seed or by cuttings. The plants should be covered in winter with pieces of glass, raised 2 or 3 in. above the plants by wire pegs. The favourite kind is Onosma taurica (echioides), 8-10 in., with golden yellow flowers in summer.

Golden drop is also the name of one of the best known varieties of plum. *See* Plum.

GOLDEN EYE. There are about a dozen British species of the delicate four-winged insect variously known as golden eye, lacewing-fly, and stink-fly, but they bear so close a likeness one to another that the differences are evident only to experts. In the larval stage they feed entirely upon other insects, and these are usually some species of aphis or their near relations, which they suck dry, certain species piling up the empty skins on their back.

The eggs on their hair-like stalks may be seen standing like a cluster of pins on a rose-leaf, and should be respected always. Each larva accounts for many aphides every day, as a few minutes' observation of its method will demonstrate. At the end of its service it spins an egg-shaped cocoon in which it passes the winter; emerging next spring as an active pupa, it at once assumes the winged form. All the species should be treated as friends.

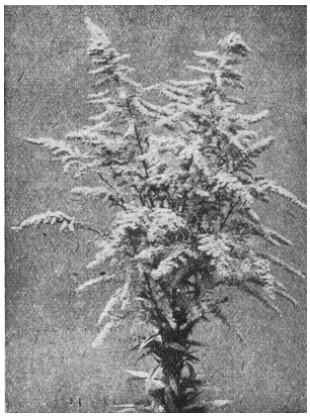
Golden Feather. *See* Feverfew.

GOLDEN FERN. So called because the undersides of the fronds are covered with a golden, powdery substance. Gymnogramme is the chief kind. *See* Fern; Gymnogramme.

GOLDEN PUDDING. Wash ¼ lb sultanas, dry them thoroughly in a cloth, and remove the stalks. Mix ½ a level teaspoonful of bicarbonate of soda with 6 oz. flour, and sieve them into a basin. To these add 6 oz. breadcrumbs, 6 oz. chopped suet, the fruit and a little grated nutmeg, and mix all well.

Whisk together a beaten egg and 6 oz. golden syrup and stir them into the dry ingredients, with sufficient milk and water to make a fairly soft dough. Turn this into a greased basin, cover it with a greased paper and a floured pudding cloth, and steam it for 2½-3 hours.

GOLDEN ROD. A vigorous, hardy, herbaceous perennial which bears showy yellow flowers in late summer and early autumn. It flourishes in ordinary soil, in sunny or shady places, and spreads quickly. Propagation is effected by division either in autumn or spring. The best is solidago Golden Wings. 5 feet high.



Golden Rod. Flower sprays of a hardy perennial which is suited to a large garden.

GOLDEN SAUCE. This sauce is made by boiling together for 5 min. 1 gill golden syrup, ½ gill water, and a tablespoonful of lemon juice.

GOLDEN WEDDING. This term is applied to the completion by both parties of 50 years of married life. Custom decrees that presents given on such occasions shall be of gold.

GOLD FISH. As a rule this beautiful carp is kept in a relatively small glass bowl, where its lidless eyes cannot escape from the constant glare of sunlight or electric light, and where it is expected to thrive with little or no food. It should be kept only in ornamental ponds or in aquaria proportioned to its size, with growing water plants which will afford it shade and partial food. Other food may include bloodworms, very small earthworms, and crumbled biscuit. Any unconsumed food should be removed. If gold fish are kept in a pond the latter should have some protection from

frost in winter, a few boards laid across one end being usually sufficient. *See* Aquarium.

GOLD LACE. Fancy gold lace made in a manner similar to silk or cotton lace has been used as a trimming since ancient times, and there are periodical revivals of fashion for the article. Such lace need not be thrown away when tarnished. The original colour can often be restored by brushing the lace gently with a soft brush dipped in methylated spirit; the work is made much easier by first tacking the lace down upon calico.

An alternative method of freshening gold or gold and silk lace is to soak it overnight in weak acetic acid or even in white vinegar. The lace should then be gently washed in tepid water with plenty of good soap, and it may be dried by pressing it lightly between soft cotton cloths. If it is desired to stiffen the lace after washing, a dip into a weak solution of clear white gum arabic will give satisfactbry results.

GOLD-TAIL MOTH. In the southern and middle districts of England the caterpillars of the gold-tail moth are a pest. Feeding naturally upon hawthorn and various forest trees, they show a fondness also for pear, apple and plum trees, likewise roses. The moth is a beautiful creature, with pure white satiny wings which, in the female, have a spread of 1¾ in. The male is smaller and his forewings have a black spot, sometimes two spots, near the hind margin.

The body ends in a fluffy tuft of yellow, which the female uses for thatching her batch of eggs. These are laid in July or August, and soon hatch; the young caterpillars spin a web at the forking of two twigs in which they rest for the winter. In spring they come out to feed. They are black in colour with a bright red stripe along the back divided by a thin black line: and there are tufts of fine black and grey hairs. Late in May it spins a cocoon. The moth emerges in July or the end of June.

The gold-tail moth should be looked for in July, when it will be found resting quietly all day on leaves. The winter nests of the caterpillars, usually not far apart, may be seen on the bare twigs, and the awakened caterpillars may be seen sunning themselves on these nests in spring. Hand-picking and destruction is employed in either case.

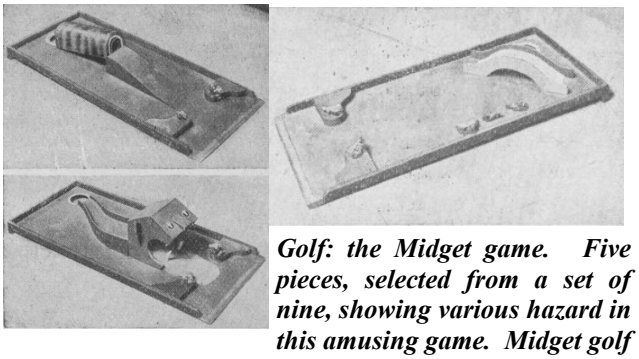
The very similar brown-tail moth is restricted in Britain almost to coast districts in Kent and Sussex. *See* Insecticide.

GOLF, MIDGET. Within recent years great interest has been developed in so-called Midget Golf, which strictly is not a game of golf at all and bears only the remotest relationship to golf proper. In America particularly Midget Golf had assumed by 1930 the proportions of a national craze and millions of money were invested in Midget Golf courses for public entertainment. The game consists entirely of hitting an ordinary golf ball with an ordinary putter into a variety of holes, the approach to which is made difficult by all sorts of ingenious contrivances.

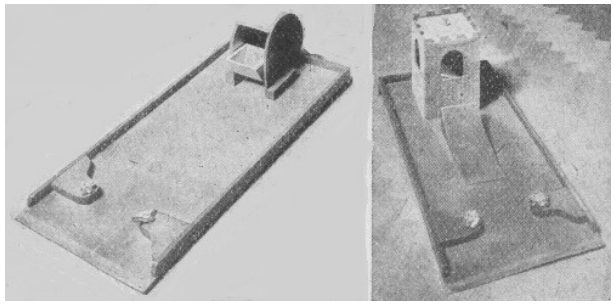
To those unfamiliar with the game the illustrations which we give will explain it sufficiently. In most cases the ball is driven up a short incline, passes through a small opening, thence down into the scoring hole, usually placed in a difficult position. The complete set of holes may be either 9 or 18, the 5 which we illustrate being selected from a set of 9. The obstacles can be laid down in any large room or on a turf lawn and the player has only to putt the ball into the hole as best he can. The one that takes the lowest number of strokes at each hole and has the lowest aggregate of strokes for the course is the winner.

Many manufacturers have put on the market ingenious Midget Golf sets either constructed of wood or in the cheaper variety of stout strawboards, painted and decorated attractively. Such sets can be obtained at all sorts of prices, but any handyman can construct them quite successfully for himself, and persons of inventive mind can very quickly improvise a set suitable for indoor use, as there is no limit to the devices for making entry to each hole difficult.

Much amusement and a good deal of exhilaration can be obtained from playing at Midget Golf, which is not to be confounded with Miniature Golf. The latter term describes those small golf courses often to be found associated with residential country hotels. They are laid out like ordinary golf courses, but designed for approaching the green by means of a mashie, and they are, of course, outside the consideration of the ordinary householder, who at most is likely to be able to turn some portion of his garden into a temporary Midget course fitted with obstacle holes somewhat on the lines of those here illustrated. *See* Clock Golf.



Golf: the Midget game. Five pieces, selected from a set of nine, showing various hazard in this amusing game. Midget golf can be played either indoors or on a lawn.(Courtesy of A. W. Gamage, Ltd.)



GOLOSHES. Waterproof rubber shoes made to wear over ordinary boots or shoes in wet weather are known as goloshes. Their chief feature is that they have

no fastenings, but their elastic tendency allows them to be pulled over the shoe, to which they fit closely. They can be obtained in various sizes, and are hard-wearing i f treated with care, and require only an occasional rubbing with a damp flannel to keep them clean. *See* Rubber.

GONG: For Household Use. There is one principal type of gong, and from it most of the existing varieties have developed. A round, smooth piece of metal is hung in or to a frame, and is provided with a beater, for which there is a resting place somewhere on the piece. The beater takes the form of a stick or bar, having a ball of some soft material, covered with leather or cloth, at the end that is used for striking.

One type of gong hangs in a heavy frame of oak or other hardwood; the frame, a square one, standing on the ground. A variant of this has an iron frame, while other metals may be used for them. Smaller gongs of the same type are made to stand on tables or other elevations, and are also suitable for use in the dining room.

GONORRHOEA. This disease is very contagious, and may be contracted indirectly from towels, sponges, clothing, etc. Symptoms usually appear on the third or fourth day after exposure to infection, though it may be rather earlier, or not for 7 or 8 days. The result of the widespread misconception as to the seriousness of the disorder is that too frequently proper medical advice is not obtained, or if a doctor is consulted his directions are not carried out properly No person who contracts the disease should be content until his doctor, after appropriate tests, is able to assure him that he is clear of infection. Vaccines have proved very beneficial in some of the cases of joint affection.

GOOD KING HENRY. The useful vegetable (chenopodium) popularly known as Good King Henry has various localized names, including wild spinach and perennial goose foot. The plant has two uses, as spinach by gathering its leaves, or as asparagus by earthing up the shoots.

Seed may be sown 1 in. deep in drills 18 in. apart during April, thinning seedlings out to 9 in. in May. *See* Asparagus.

GOOSE. Anyone owning grass land or living near a common will find it profitable to keep geese, as, being persistent grazers, they need little else in the way of food. Swimming water is desirable when breeding.

Their housing is quite a simple matter, any shed or outbuilding sufficing so long as the roof and walls are sound and the floor dry. The floor must be covered with rough-cut litter to form bedding material. The goose usually lays its eggs in rough nests in the corners of its house, the bird following her wild protective instinct by covering her egg with litter when she vacates the nest after laying. In breeding, well-grown geese are usually mated with a well-matured gander, and hatching may either be effected by a goose or a hen. The former, which will only sit on the nest she is accustomed to lay in, may be entrusted with from 10 to 12 eggs, but if a hen is used she will not be able to cover more than four. The period of incubation varies from 28 to 30 days.

Goslings are the easiest to rear of all poultry. Their first food should consist of hard-boiled egg, chopped up finely and mixed with biscuit meal, to which a little water or skim milk is added to moisten it. After a couple of days the egg may be discontinued and the birds placed upon a cheaper and plainer diet.

Wheat is a most useful food for goslings, but it should be given scalded, not raw. A good method is to scald it for some hours, drying it off with ground oats or barley-meal. Ground oats, barley-meal, and toppings are all useful foods, either singly or mixed in equal proportions. When the goslings are eight to ten weeks old whole grain may be given, preferably wheat, and some bone-meal should be added to the food. Green food, too, is necessary until they can forage for themselves.

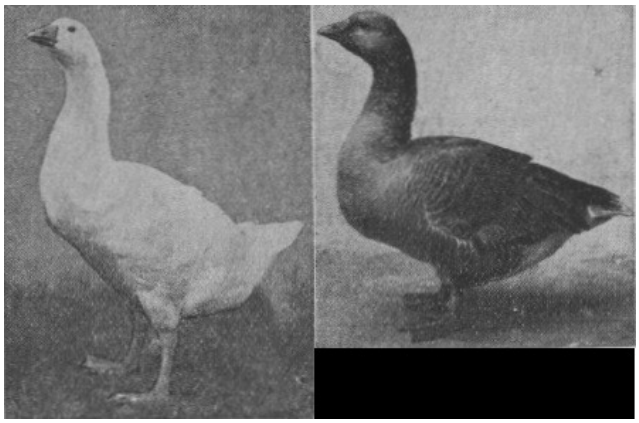
To fatten geese for Christmas they should be confined about a month beforehand to a shed, preferably one with an open front covered with wire netting, and fed liberally on a diet consisting of barley-meal or Sussex ground oats for soft food and barley or other good grain at night, greenstuff being supplied liberally. The goose is a long-lived bird, not arriving at maturity until its third year, and often reaching the age of thirty, but its period of usefulness does not extend beyond eight years.

Geese will continue to produce eggs profitably until an advanced age, and instances are known of geese 19 years old which still continued to lay an average of 55 eggs each per year. For hatching purposes the eggs of mature birds are more reliable than those of young stock.

How to Cook. The best way of cooking a goose is to roast it; but geese are also braised. To roast one, prepare it as for duck, singe it thoroughly, and then fill it from the tail end with sage and onion stuffing. Fold the skin over the opening and keep it in place with a small skewer. Turn the flap of skin at the neck under the body and fasten that in a similar manner. Truss it in the same way as a duck, tie a piece of greased paper over the breast, and roast it before a clear fire or in a quick oven, keeping it well basted. About ½ hour before the bird is cooked take off the paper so that the breast may brown. A medium-sized bird should take from 1½—2 hours. When it is ready for serving, take out all the skewers, lift it on to a hot dish, and hand with it some good gravy and apple sauce.

To braise a goose, prepare and truss the bird as for roasting, and dust it over with a little flour. Melt 2 oz. margarine or bacon fat in a saucepan, and when it is hot put in the goose and brown it all over. Add a carrot, 1 or 2 sticks of celery, a sliced onion, a bunch of herbs, 1 gill white wine, 10 peppercorns, and a little salt, and cook the whole for a few minutes until the

wine is reduced by half. Pour in enough stock to cover half of the goose, and cook over slow heat.



Goose. Left, goose of the Emden breed, very popular in England. Right, dark grey Toulouse goose.

The time taken in cooking depends upon the age and size of the bird, but from 2-2½ hours is usually required. Baste the goose occasionally with the stock, and when it is ready turn it on to a hot dish. Pour the liquid into a smaller pan, reduce it, and when it is of a rich brown colour skim it, pour a little round the goose, and serve the remainder in a sauceboat. Apple or cranberry sauce should accompany braised goose. *See* Carving; Duck; Fowl; Poultry.

GOOSE: The Game. Known as the royal game of goose, this is sometimes called the race game. To play it the figure of a goose should be drawn upon a piece of paper and divided into 63 sections, which are numbered. If desired, any other number can be chosen, but 63 is the usual figure. A draught-board or any piece of paper can be used instead of a goose. A pair of dice and a dice box are also necessary, but no particular number of players is needed.

Each player has a counter. In turn each rattles the dice, and according to the number thrown he moves his counter along the goose. The object of the game consists in exactly reaching the 63rd partition, and the player who does this first wins. For instance, if a player has reached the 56th partition he must throw 7 to finish. If he throws more, e.g. 9, he must go back 2, and this continues until he secures the number that carries him exactly into the 63rd division.

GOOSEBERRIES FROM GARDEN TO TABLE
The Cultivation and Cooking of this Useful Fruit

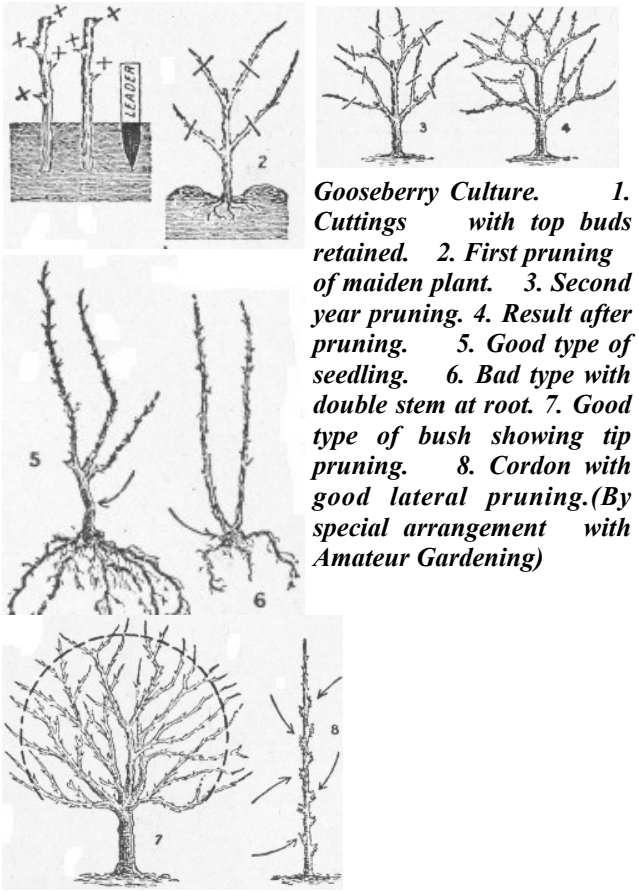
For other information on the subject of fruit culture the reader is referred to the articles Fruit; Grafting; Kitchen Garden Pruning; and those on other fruits, e.g. Apple Currant. See further Bottling; Insecticide; Jam; Spraying; and the entries on Magpie Moth and other pests.

This is the most useful of the bush fruits, for under fair treatment it crops well and regularly, and the fruits are valuable both when green and ripe. Botanically it belongs to the same genus or plant group as the currants (ribes); its botanical name is Ribes grossularia.

The gooseberry nourishes in ordinary well-tilled land which is kept in a fertile state by adequate manuring. The bush form is the most profitable, but the single, double and treble cordons are useful for planting alongside a walk in the kitchen garden; they bear exceptionally fine fruits in limited numbers, and in addition the bushes are easily and conveniently managed.

The best time to plant is in November, but planting may be done at any time in mild weather between October and mid-March. The bushes ought to be set at 5 feet apart each way. The uppermost roots need not be covered with more than 2 or 3 inches of soil. An annual top-dressing of stable or farmyard manure in February is beneficial.

Pruning is an important detail of management. Amateurs often make the mistake of pruning the bushes too severely, with the result that growth is vigorous but the crops are poor. Pruning should take the form of thinning out rather than severe cutting back. The branches ought to be so far apart that the hand can be passed between them conveniently, and to ensure this it is necessary to cut out shoots that tend to crowd the main branches. Parts of the old branches can often be cut out with advantage to make room for young shoots.



Gooseberry Culture. 1. Cuttings with top buds retained. 2. First pruning of maiden plant. 3. Second year pruning. 4. Result after pruning. 5. Good type of seedling. 6. Bad type with double stem at root. 7. Good type of bush showing tip pruning. 8. Cordon with good lateral pruning.(By special arrangement with Amateur Gardening)

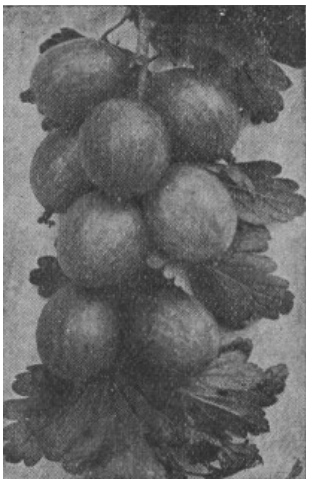
The tips of the branches ought to be cut off, and branches which are so low down that the fruits would

be spoilt by soil splashed up during rainy weather should be removed. The ideal gooseberry bush is one with a stem 8 or 9 inches high. After thinning out is finished the remaining side shoots should be shortened to within two buds of the base of the past summer's growth. It is usual to deter the pruning of gooseberry bushes and cordons until towards the end of February, because the buds are so liable to be damaged by birds. In many gardens it is in fact necessary to net the bushes. Scattering a mixture of soot and lime over the branches affords some protection, so also does the practice of tying the branches loosely together.

The pruning of cordon gooseberries is perfectly simple, for it consists merely in shortening the side shoots to within two buds of the base of the past summer's growth. The leading shoots, those which extend the branches, are pruned so as to leave about 8 inches of the past year's growth.

Cuttings provide a simple way of increasing gooseberries; pieces of the previous summer's shoots 8 to 10 inches long are inserted out of doors in October or November, a small straight-backed trench is dug out, sand is scattered along the bottom and the cuttings are set at 6 inches apart, at least half each cutting being beneath the soil. All except three or four buds at the tops of the cuttings should be cut out.

These are some of the best varieties, of goose berries with large fruits: Red: Crown Bob, Lancashire Lad, Whinham's Industry; Green: Plunder; White: Careless, Shiner. Yellow: Keepsake, Leveller. With small fruits: Red Ironmonger (first-rate for jam), Keen's Seedling, Warrington; Green: Langley Gage, Green Gascoigne; Yellow: Golden Gem, Yellow Sulphur; White: Whitesmith.



Gooseberry. Fruit of Criterion variety.

How to Cook. In cookery, the gooseberry is employed in a variety of ways, pie-making, stewing, and bottling being among the most common. It is used for making jam, wine, chutney, and many different kinds of sweets, including compotes, jellies, flans, puddings, etc, The amount of sugar required depends almost entirely upon the kind of gooseberries used, green, unripe ones naturally demanding more than the riper fruit. Directions for bottling gooseberries will be found in the general article on fruit bottling ; goosebeny recipes are dealt with under their respective headings.

Gooseberries for use as dessert may be either red or golden, the latter being generally preferred. There are hairy and smooth, varying from the size of a cherry to that of a small plum. For all ordinary cooking purposes, unripe green gooseberries are undoubtedly the best sorts to employ.

To stew gooseberries, top and tail them and wash them if necessary, then put them into an enamelled saucepan with 3 tablespoonfuls of sugar to every pint of the fruit, and just cover them with water. Let them boil gently until tender but unbroken, and serve them, hot or cold, with custard.

Gooseberry Amber. This sweet is made by melting 2 oz. of butter in a saucepan over the fire, and then adding to it 1 lb. of trimmed and washed gooseberries and ¼ lb. castor sugar. Let these cook gently until the fruit is reduced to a soft, thick mass, then stir in 1 oz. breadcrumbs previously rubbed through a wire sieve and beat in well the yolks of 3 eggs. Turn the whole in a buttered pie-dish.

Bake the mixture in a moderate oven for about ½ hour or until it seems set, then beat up the whites of the eggs to a very stiff froth, adding lightly to them 3 level tablespoonfuls of castor sugar and a few drops of vanilla essence. Heap this meringue roughly all over the top, and sprinkle a little more castor sugar over all. Put the dish in the coolest part of the oven, and let it remain there until its contents are crisp and pale brown in colour. Serve the sweet at once.

Gooseberry Chutney. Gooseberry chutney is made by chopping finely about 1 quart green gooseberries, ¾ lb. stoned raisins and 6 oz. onion. Put these into an enamel pan, with ½ lb. brown sugar, 2 tablespoonfuls mustard seed, 1 quart vinegar, ½ saltspoonful turmeric. 1 good pinch cayenne, 1 tablespoonful ground ginger, and 2 small tablespoonfuls salt; then heat the whole slowly, and keep it boiling gently but steadily for 1 hour.

The chutney may be strained through a coarse sieve or left unstrained, and when cold should be put into clean, dry jars, and corked and tied down tightly. It improves if kept for a time.

Gooseberry Cream. To make this sweet, take about 1 lb. or 1½ lb. gooseberries, top and tail them, and put them into a saucepan with ½ pint water and 4 oz. castor sugar. When the fruit is soft rub it through a hair sieve and add a squeeze of lemon juice. Then melt ¼ oz. gelatine in two tablespoonfuls of water and stir this into the gooseberry purée. When this is quite cold, whip ½ pint cream and mix it lightly in. Colour with a little green colouring and put into a mould to set.

Gooseberry Fool. Top and tail 2 lb. gooseberries, wash them in cold water, then put them in a pan with ¾ lb. sugar and 1 gill of water. Boil gently, and if the saucepan gets too dry, add a little more water, but as little as possible. When the gooseberries are soft rub them through a wire sieve and measure the pulp. To each pint allow ½ pint boiled custard. Mix pulp and custard well together, sweeten to taste, and serve it in a glass dish or in custard glasses, with whipped cream on

top. Either cream or milk can be mixed with the gooseberries in place of custard.

Gooseberry Jam. To every pound of green fruit used in making this jam allow the same quantity of sugar and ½ pint of water. Put the sugar and water into a pan over the fire, and boil them for ¼ hour; then skim the syrup and add the gooseberries. Let the whole simmer gently for about ¾ hour, stirring all the time, and then test the jam on a plate. When it is done, pour it into jars and tie them down immediately.

Gooseberry Jelly. To make this, take two quarts of green gooseberries, which should be washed, topped and stalked. Two quarts will make a pint of juice, so if more is required more goose berries can be taken. Put them in a preserving pan and just cover them with cold water. Bring them to the boil and simmer them until they are broken and pulpy, when they should be strained through a jelly bag or a clean cloth tied on to the legs of an inverted chair. After this has been done, they should be left to drip overnight into a bowl.

The juice should be measured and put into a clean jar with 1 lb. of loaf sugar to each pint. Stir it until the sugar has melted; then boil it fast for about 20 minutes, until the jelly sets when tested. Keep it well skimmed, afterwards putting it into small pots, which should be covered in the same way as jam jars.

Gooseberry Pudding. A boiled gooseberry pudding large enough for 5 persons can be made by sieving together ½ lb of flour, ½ teaspoonful of baking-powder, and a little less than that quantity of salt. Then add 4 oz. of finely chopped beef suet and mix the whole to a stiff paste with some cold water. Cut off two-thirds of the pastry, roll it out, and with it line a greased pudding basin. Wash about 1 pint of gooseberries, then top and tail them.

When the basin is half-full of fruit, add 2 or 3 tablespoonfuls of brown sugar, then put in the remainder of the gooseberries, and lastly enough water to half-fill the basin. Roll out the remaining piece of pastry to fit the top of the basin, wet the edges, and then press them together. Cover the pudding with a scalded and floured pudding-cloth, then put the basin in a pan containing plenty of fast-boiling water. Let it boil steadily for 2 hours, adding more boiling water when necessary. When the pudding is cooked, lift the basin out of the pan and let it stand for a minute or two after removing the cloth, so that the steam may escape: then serve it on a hot dish.

GOOSEBERRY CLUSTER CUP. This is a disease that affects gooseberry bushes; the fungus forms bright orange patches on the leaves and fruit. The most satisfactory method of arresting its spread is by collecting and burning infected leaves and fruit.

GOOSEBERRY MILDEW. The gooseberry plant is attacked by two distinct mildews, the European and the American. The former occasionally attacks red currant bushes.

The most obvious differences between the two may be summed up as follows: Whereas in the European mildew the fungus occurs as a very delicate mould or mildew on the leaves, the American mildew forms a dense white woolly mould which, though found on the leaves, attacks chiefly the shoots and berries. As the growth of the American mildew continues, the white stage gives place to a light brown woolly phase, and finally to a thin dark brown felted mat, which is very conspicuous on the berries and shoots. This condition is never found in European mildew.

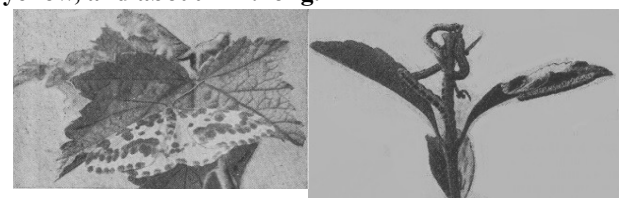
The American mildew is a much more serious danger to the fruit-grower. There are two principal lines of treatment against it: spraying, to prevent and to destroy the white or summer state; and tipping, to eliminate the brown or second stage.

For spring and summer spraying lime-sulphur is the most convenient and satisfactory substance. The strength usually employed is 1 gallon of lime-sulphur to 29 gallons of water. Three, of at least two, sprayings should be given, the first about the first week in April, the others at intervals of three or four weeks.

Tipping consists in the cutting away in autumn of all shoots which show signs of the presence of mildew; they must be burnt. The ground under diseased bushes should be dug over in winter in order to bury the winter spores, and if only a few bushes are grown dead and fallen diseased leaves must be burnt.

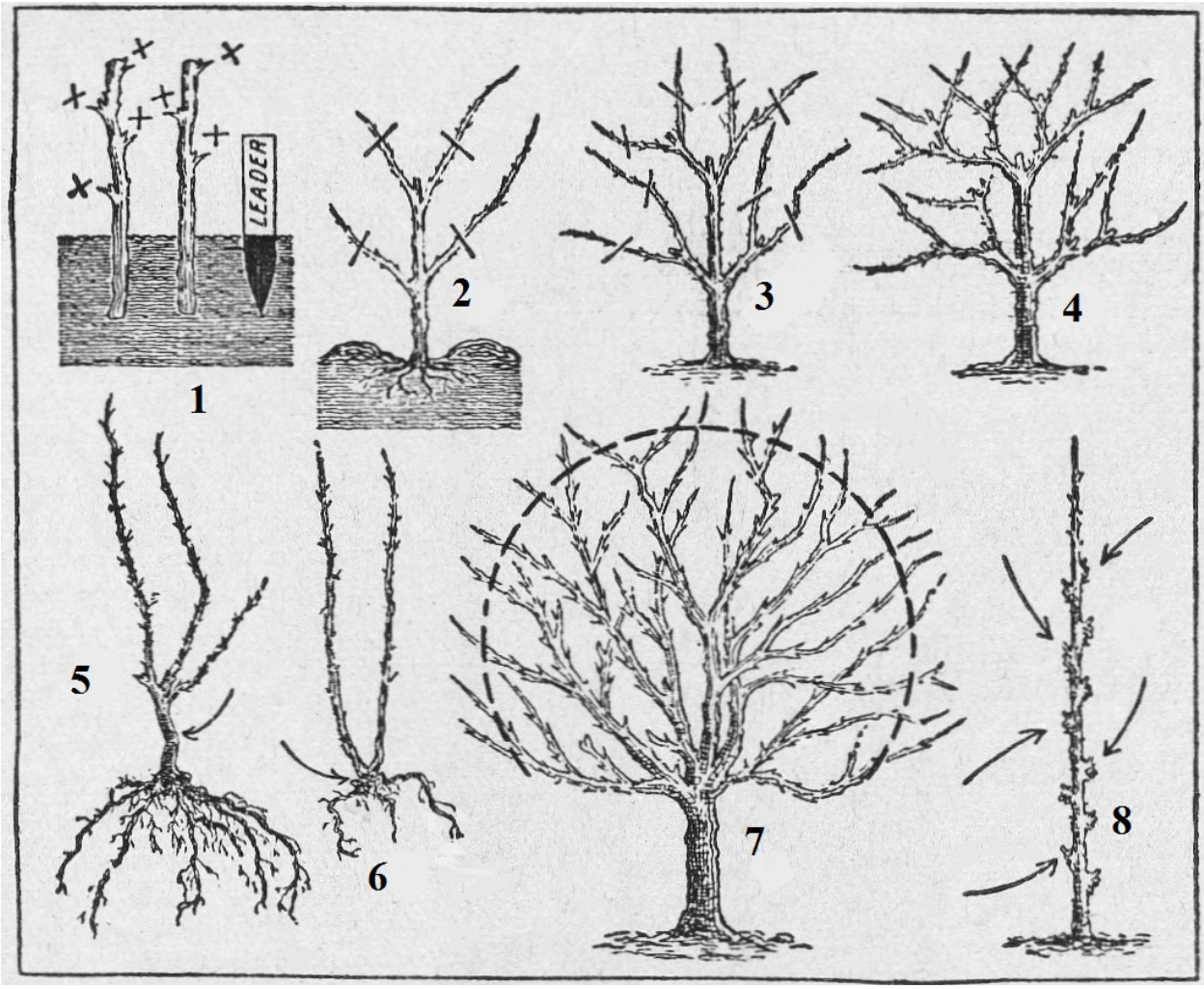
It is illegal to sell gooseberry or currant bushes affected with the disease, but the bushes may be sold after notification if all the diseased shoots are cut away. Much of this information is taken from Leaflet 273, published by the Ministry of Agriculture. *See* Spraying.

GOOSEBERRY MOTH. This pest, more commonly known as the magpie moth, is very destructive. It is only seen at night, as a rule, and can be easily identified by its creamy body and wings prettily marked with black and white. The parent moth deposits its eggs on both gooseberry and currant bushes, and these hatch out into voracious looper caterpillars, which are spotted black and creamy yellow, and about 1 in. long.



Gooseberry Moth. Pest destructive to gooseberry bushes. Right, caterpillars attacking young leaves.

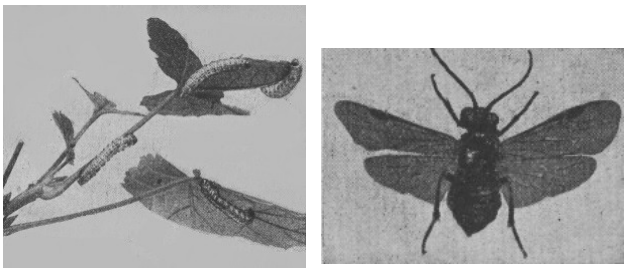
Remedies are forking a generous dressing of fresh lime and soot into the top soil around the bushes in winter, applying a winter wash to the trees at the same time, together with hand-picking of the caterpillars. *See* Caterpillar; Fruit.



Gooseberry Culture. 1. Cuttings with top buds retained. 2. First pruning of maiden plant. 3. Second year pruning. 4. Result after pruning. 5. Good type of seedling. 6. Bad type with double stem at root. 7. Good type of bush showing tip pruning. 8. Cordon with good lateral pruning. ***(By special arrangement with Amateur Gardening)***

GOOSEBERRY SAWFLY. The sawfly caterpillars devour the leaves and, in a bad attack, strip the bushes completely.

The adult sawflies first appear in April and May. Eggs are laid on the gooseberry leaves, and when the caterpillars are hatched they feed on the leaves. The two methods recommended by the Ministry of Agriculture and Fisheries (Leaflet 30) are hand-picking and spraying. Hand-picking is the simplest method in the case of a few bushes, but it must be done before the colonies of young larvae have scattered over the bush. Some prefer to pick the leaves on which the eggs have been laid.



Gooseberry Sawfly. Larvae of a destructive insect pest which attacks gooseberry and currant bushes. Right, female adult fly.

Spraying is thoroughly effective; the chief difficulty lies in the fact that the best washes are poisonous. Lead arsenate, 1 oz. in 1 gallon of water, may be used in the case of an early attack, where it can be applied before the gooseberries have flowered and also after the fruit has been gathered. Hellebore, when fresh, and nicotine are also effective and, though poisonous, do not retain their poisonous qualities for long. They may therefore be used with safety if an interval of three weeks be allowed between the dates of spraying and packing. *See* Insecticide; Spraying.

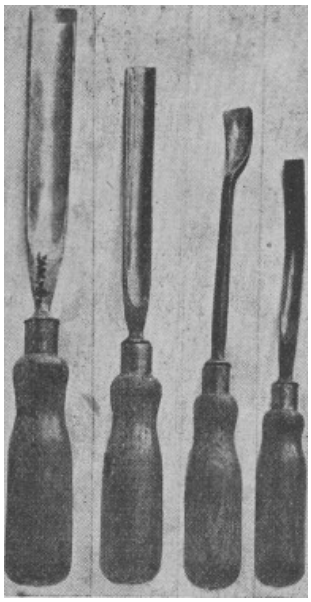
GORE. A gore is a triangular piece of material sewn into a garment to enlarge the lower part when the material is not wide enough to cut the full width required in one piece. These gores are usually added to the lower ends of side seams.

GORGONZOLA CHEESE. This is the name of a highly esteemed and exceedingly nutritious Italian cheese, considered by some to be superior to Stilton, which it slightly resembles. It is a round, flat, broad cheese, which when cut should be of a deep yellowish cream colour, with rich green veinings.

GOSS PORCELAIN. The china produced by W. H. Goss was made at Stoke-upon-Trent about 1860. The name is sometimes used inaccurately to indicate the products of other heraldic potteries as well. The Goss name is usually but not invariably present, and on more ambitious pieces a rising falcon is used as a mark.

GOUDA CHEESE. Flat, with rounded edges, Gouda differs from Edam or Dutch cheese in shape and also in colour, being of a dusky yellow. Its weight varies from 3 to 15 lb., and some are larger.

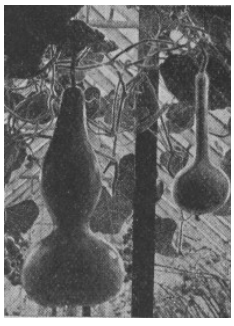
GOUGE. A gouge is a curved chisel, the blade being curved transversely so as to be trough shaped instead of flat. Paring gouges are ground internally, and are intended for hand planing of grooves. Firmer gouges are ground externally and are used for scooping out timber into hollows. Gouges are made in various widths, but a $\frac{5}{8}$ in. firmer gouge is a useful size. *See* Firmer Gouge.



Gouge. Left to right, paring gouge, firmer gouge, front bent carver's gouge, curved gouge.

GOURD. These are deciduous climbing and trailing plants, bearing large fruits of diverse shapes; they are useful for rapidly covering arches, trellises, poles and open fences. They vary from less than 1 oz. in weight to the huge snake cucumber over 4 ft. in. length. Gourds may be grown on raised beds like marrows. The seed is sown in a greenhouse or frame in March, and the seedlings are hardened off and planted out in June in rich soil.

The following list of varieties suggests the many quaintly shaped and marked specimens which can be grown: Turk's cap, bishop's hat, serpent, gooseberry, Hercules' club, gorilla, siphon, half moon, giant's punchbowl. These are large fruiting kinds. Among the smaller sorts are gourds resembling fig, cricket ball, thumb, cherry, hen's egg, pear, bottle and orange. *See* Pumpkin.



Gourd. Calabash gourd growing in a greenhouse. (Courtesy of Amateur Gardening)

GOUT. Gout is a disorder of metabolism in which uric acid accumulates in the blood and tissues and causes various manifestations.

The tendency to gout is often inherited and may be transmitted through females who show no sign of the disease themselves. Other causes are an excessive consumption of rich food and of wines. A regular and copious consumption of malt liquor, even when the

food supply is spare, results in what is called poor man's gout. Sedentary habits predispose, especially in conjunction with other causes.

An acute attack of gout is due to the deposition of crystals of biurate of sodium in the cartilages of a joint. A poor circulation in the part, some slight injury or something similar may be the exciting factor, but the excess of uric acid in the blood and tissues, which is the essential feature of gout, alone makes the attack possible. The painful joint should be treated by heat in some form; cold applications are dangerous. The best drug for relieving the pain is colchicum, either the wine or the tincture, in doses of 20 to 30 minims every four hours, until the pain ceases; but colchicum should only be used on medical advice, as it may cause depression. Water or gruel containing potassium bicarbonate should be drunk freely. On the night of the attack it is as well to take a mercurial purge, say 3 or 4 grains of calomel, and follow this up with a dose of Epsom salts in the morning. The diet should be restricted to milk and barley water unless other directions are given.

In chronic gout more joints are affected and there is a greater tendency to deposits in the soft parts about the joints and elsewhere, such deposits, or tophi, sometimes ulcerating through the skin. Because of their white, chalky appearance these deposits are sometimes called chalk-stones; they do not, however, consist of chalk, but of sodium urate. In chronic gout there is a tendency to arteriosclerosis. The patient often has a sallow complexion and suffers from dyspepsia.

A person who is of the gouty habit should be moderate in eating, avoiding fats and rich food, meat extracts, sauces, liver, kidney and sweetbreads, and restricting red meat, starchy foods and sugar. Fresh fruit and vegetables may be taken, but, as a rule, tomatoes, cucumber, rhubarb, bananas, gooseberries, currants and strawberries are unsuitable. Potatoes may generally be allowed. Asparagus and beans and other pulses should be taken in small quantities only. Alcohol is best avoided altogether. Water should be taken freely.

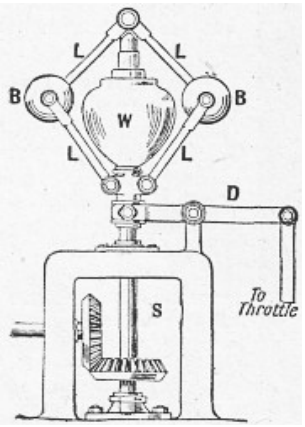
An active open-air life should be adopted. Clothing should be warm and the skin should be kept active by regular baths and brisk friction with a towel.

When attacks have occurred, or there are manifestations of irregular gout, it may be worth while to have a spa treatment at Bath, Buxton, Harrogate, Aix-les-Bains, Contrexéville, Karlsbad, Homburg or elsewhere.

GOVERNESS. A nursery governess is one who gives the children simple instruction in addition to looking after them generally. Nursery governesses are almost always resident, but other governesses may be either resident or daily. Sometimes two or more families combine to engage a governess for their children. Most governesses are expected to supervise the children's recreation or some of it, but the extent and nature of this duty should be clearly stated on engagement.

Unless she is able to secure exemption, a governess must be insured under the national health insurance scheme. Governesses can be engaged through the advertisement columns of the newspapers and through some of the teaching agencies in London and elsewhere. Nursery governesses can be secured sometimes through the ordinary registry offices. The remuneration, which varies considerably according to duties and capabilities, is usually paid by the month. *See* Insurance.

GOVERNOR: Of an Engine. This is a device for maintaining a constant speed of rotation of the crankshaft under variable loads. It derives its motion from some rotating part of the engine, and is so devised that when the speed of the engine increases the governor reduces the power supply, and augments it when the speed decreases. They are used on gas, oil, and petrol engines as well as upon steam engines.



Governor for regulating the speed of an engine.

Most governors for steam engines follow the original ball governor of James Watt, and a diagram of a modern example is given. S is a vertical shaft, rotated by means of bevel gearing, and a belt from some convenient part of the engine. Four links, L L L L, connect two metal balls, B B, with the top of S and with a weight, W, able to move freely up and down S. When the engine speed increases beyond that at which the governor is set to function, the fly-balls, B B, swing out, raise the weight, W, and a collar connected by lever D to the throttle, and close or partly close the throttle, thus cutting off the supply of steam and reducing the engine speed.

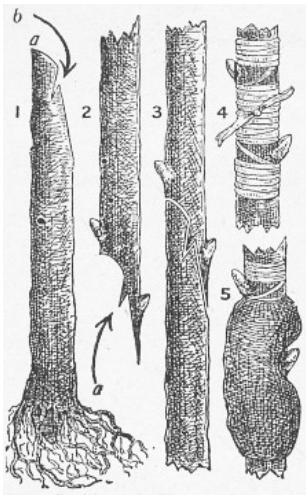
The governor fitted to a clockwork mechanism (e.g. a gramophone motor), brings a friction brake into operation when the fly weights swing out, thus checking the speed.

GRAFTING: For the Gardener. This useful gardening operation is best carried out late in March and in April, during mild, dull weather, when the sap is running freely. The graft or scion is a piece of branch of the previous summer's growth cut from a tree of the variety it is desired to perpetuate; the stock is the tree on which the graft or scion is inserted.

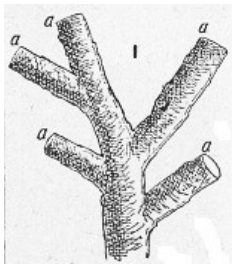
Grafting depends for its suceess on fixing a scion on the stock in such a way that the cambium layers (the seat of growth), which lie immediately beneath the bark, are in contact. It is necessary that the scions or grafts be in a less advanced state of growth than the stock and to ensure this it is usual to cut them off the trees in winter, tie them in small bundles, and half bury them in the soil of a shady border.

There are various forms of grafting. Crown or rind

grafting is the most useful, for it enables the gardener to refurnish old trees of worthless varieties with fresh branches of good varieties.

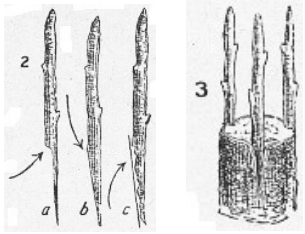


Whip Grafting. 1. Stock suitably prepared: a, correct cut; b, seat for tongue of scion. 2. Scion: a, tongue. 3. Stock and scion fitted together. 4. Same bound together. 5. Whole covered with grafting wax.

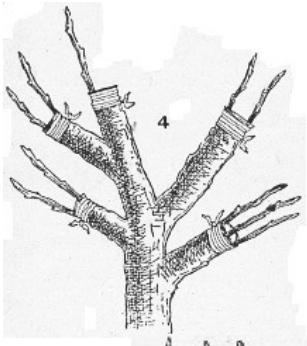


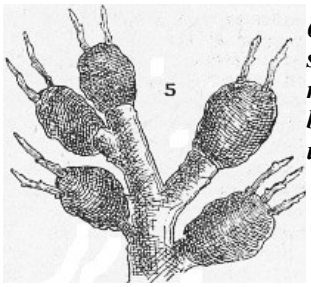
Grafting. Method of crown grafting.

1. Tree preparation at a.

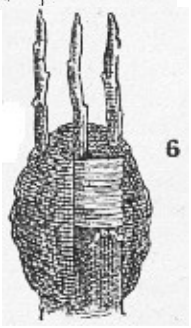


2. Scions: a, correct; b and c, badly prepared. 3. How scions are inserted. 4. Scions bound in position.





6. Section showing raffia binding under wax



5. Final binding with grafting wax.

The branches of the old tree are cut back to within 12 to 18 inches of the base in March. The grafts or scions (cut in winter from a tree of the variety it is wished to increase) should be 8 inches or so long and cut so that each one tapers to a point at the base. Three or four grafts may be inserted in each large branch. The bark of the latter is slit to the same depth as the tapering part of the scion, and is lifted to allow the scion to be pushed down behind it. The scions are then made secure with raffia, and covered with grafting wax or puddled clay to exclude the air. Any shoots which develop on the stock (the branches of the old tree) should be cut off. When, in summer, the grafts or scions begin to grow, they should be supported with thin sticks to prevent their being blown out in windy weather.

When both stock and scion are of approximately the same width saddle grafting is usually practised. The top of the stock is cut in the form of a wedge and the base of the scion is cut so that it fits over it exactly. The work is completed by tying and covering with grafting wax or clay.

Grafting Wax. Wax used for grafting purposes can be bought from seedsmen and others, but if desired it can be made at home from the following recipe:

Tallow	1 part
Beeswax	2 parts
Resin	4 „

These should be melted together and the liquid painted over all the cuts with a brush while it is still hot. *See* Apple; Rose.

GRAIN: The Measure. This measure of weight is chiefly used by chemists, although it is also found in avoirdupois and troy weights. In apothecaries weight 20 grains make one scruple, and in avoirdupois weight 7,000 grains go to the lb. The ounce in apothecaries' and troy weights consists of 480 grains.

GRAIN: In Wood. The term grain refers generally to the character and size of the growth rings of timber. Beautiful grain is more naturally inherent in some woods than others; some woods depend for their figur-ing upon the annual rings, others upon the medullary rays, others again upon the juncture of a branch to the trunk.

Grain. Fig 1, section of a log showing growth rings and medullary rays.

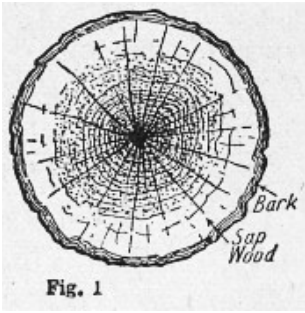


Fig. 1

Fig. 1 represents the section of a log. Every year a growing tree adds a fresh layer to the outside, thus forming a series of concentric rings by which it is usually possible to tell the age of the tree. The outer part or sap-wood is in many woods of a lighter colour and is much more liable to shrink than the heart wood, as it is softer, and contains more moisture. The medullary rays radiating from the centre carry nutriment and occur in every wood but are not always visible; in oak or beech they show strongly, when cut, in the form of white layers which are termed the silver grain, as in Fig. 2. If the ends of a sawn oak log be examined, they can be seen in the form of narrow white lines.

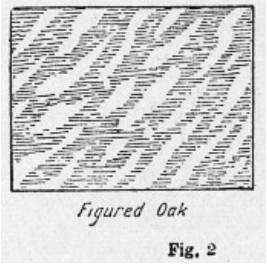
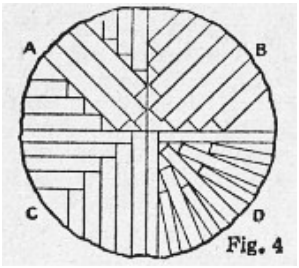


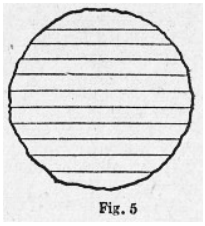
Fig. 2

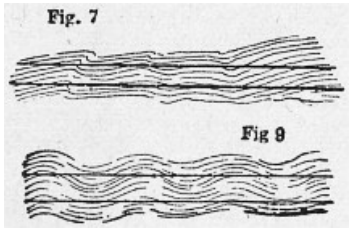
Fig. 2. Medullary rays showing as white layers.

The boards should be cut parallel to these rays. Fig. 4 shows a few methods of cutting in this way. D giving the maximum amount of figuring, but it will be obvious that a certain amount of waste occurs between the cuts, so that figured oak is always more expensive than plain. The latter (Fig 3) is cut as in Fig 5. by which method there is no waste: the centre board only will be figured. Fig. 6 shows the difference between two boards cut from the same tree in different places.









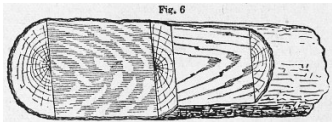


Fig. 3. Grain of plain oak. Fig. 4. Methods of cutting parallel to rays. Fig. 5. Cutting without waste. Fig. 6. Difference in grain of two boards from same tree. Fig. 7. Undulations in wood from which a straight board is cut. Fig. 8. Cutting tangentially to rings. Fig. 9. Board cut through fiddle-back mahogany.

A tree never grows perfectly straight, so that when the log is converted into boards the undulations in the direction of the grain occur in the thickness of the wood by reason of the board being cut in a straight line. (Fig. 7) This is the reason why, when planing a piece of wood, parts of it will tear up when planed in a certain direction. These waves or undulations occur with greater frequency in some woods than others. In pine they are sometimes hardly apparent, and in oak are generally large in proportion: in mahogany and sycamore they may appear as fiddle-back. This consists of a series of minute waves in close formation and when polished shows alternate light and dark streaks running across the grain. Fig. 9 shows a board cut through fiddle-back mahogany.

How Curl Grain is Obtained

Another well-known variety of grain is that known as curl, which is obtained by cutting the tree at the juncture of a branch. The main direction of the curl usually is curved, and when veneers are cut the two adjoining leaves are almost identical, so that the most beautiful effects are obtainable by matching them. These curls are seldom cut into solid boards, partly because of their comparative rarity and cost, and partly owing to the fact that they are liable to twist and warp, the grain running in almost every direction.

Burrs, burr walnut for instance, are the result of a cut being made through a growth or excrescence produced on certain kinds of trees. These growths are usually the outcome of the attack of fungi and result in the appearance of innumerable small shoots, the whole sometimes growing to a considerable size and yielding large leaves of veneer. They are also to be found on the stumps of coppiced trees.

When a pine log is cut as in Fig. 5 the centre plank does not contain the best figuring, as the rings appear at each side in the form of narrow parallel lines of alternate light and dark stripes. In the outer planks the stripes are wider and have a V-shaped formation, the beauty of which is enhanced by the natural irregularity of growth. A method ot cutting for work requiring an attractive appearance is shown in Fig. 8 in which every plank runs tangentially to the rings.

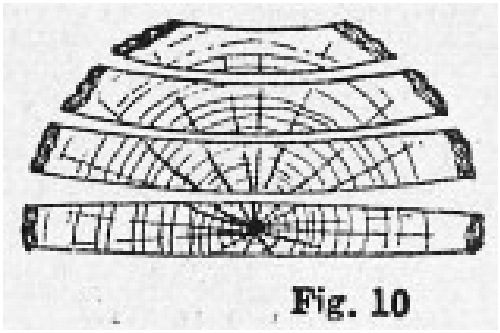


Fig. 10. Shrinking tendency in a sawn log.

The question of cutting is important for other reasons besides that of figuring. Fig. 10 shows the natural shrinking tendency of a sawn log, so that for work requiring an absolutely reliable surface, only those running diametrically should be used. D, in Fig. 4, is the ideal cutting for this purpose, and as in oak the silver grain is also in evidence, the method is wholly desirable. *See* Mahogany; Oak Wood. Woodcarving.

GRAINING AND MARBLING

Suggestions tor the Artistic Treatment of Wood Work

This article describes the surface treatment of white woods to simulate oak and other hardwood; it contains also a section on simple marbling. See also Wood and the articles on other forms of ornamentation, e.g. Enamelling; French Polishing; Lacquer; Painting; Varnish.

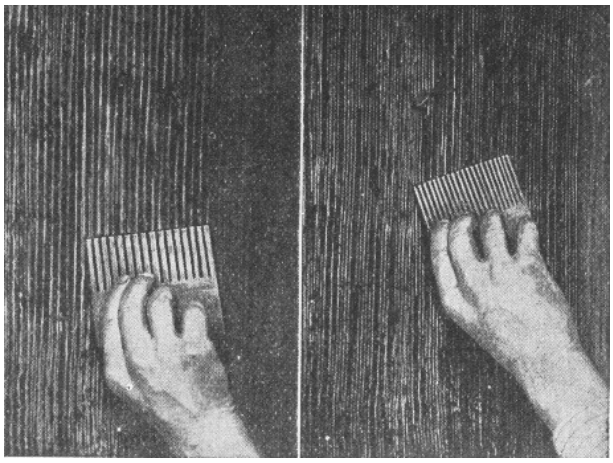
The process of reproducing the colour and appearance of natural wood by a manipulation of paint in superimposed layers is known as graining, the grain being produced on the paint while it is still wet. Marbling is the corresponding process to simulate marble.

Graining is essentially an art, results being good or bad according to individual ability; success can come only with experience. The essential requirement is that the grainer himself shall be familiar with the

appearance of the natural wood.

The tools required include painters' brushes and combs. The latter are made of steel in various widths, and with varying numbers of teeth to the inch, usually from 6 to 15; others are made of leather, bone and other flexible materials. Old hairdressers' combs may be pressed into service. Leather combs can be made at home from a piece of stout leather, the teeth being cut to shape with a pocket knife. Several sorts of brushes are needed, including a selection of overgrainers, mottlers, and shaders. A first-class badger hair softener is required and should be about 3½ in. wide. A few camel hair, sable, and fitch brushes are necessary for the veining and similar work, together with a bone thumb-plate and a quantity of clean rag.

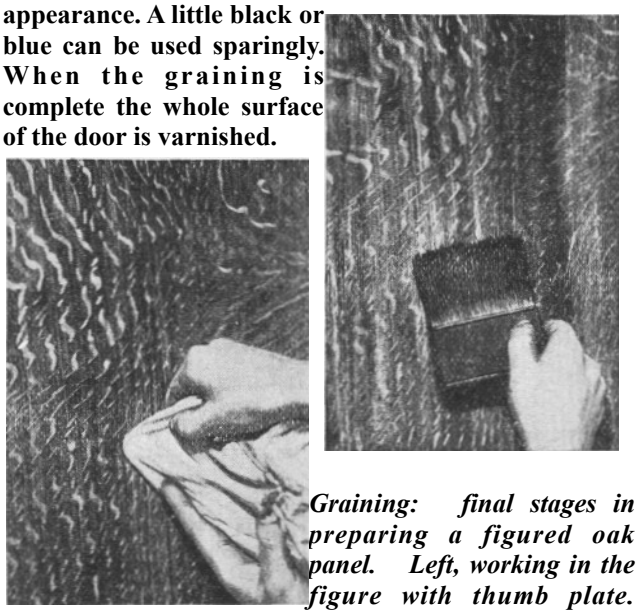
Imitating Oak Grain. The commonest form of graining is that which represents oak, ordinary deal doors being treated in this way. The ground is first prepared by stopping, priming, and undercoating, as if for ordinary paintwork; then the ground colour is applied. The tint must be the lightest that is to show on the finished work. The grounds will be composed of white lead, or other equally good white, stained with yellow ochre, or chrome, applied as ordinary paint, and finished with a slight gloss. The graining colour may be obtained by a mixture of raw umber or other colour, and should contain plenty of driers. It is brushed thoroughly into the door, after the previous coat is quite hard, and should not be applied thickly, but must be worked well in.



Graining: two stages in preparing a figured oak panel, Left, straight grain worked on the prepared ground. Right, breaking up grain with fine steel comb.

Apply the graining colour to one of the panels only at the start, having previously studied the style of graining to be copied. Supposing it to be light figured oak, this will require a coarse leather comb to produce the straight part of the grain. Then, next to this, the grain is worked in with a medium toothed steel comb; the combing with this tool is carried about half-way across, producing a series of lines wide apart at the outside and closer at the middle of the panel. With a fine steel comb work over the whole of the surface, with a slightly wavy motion, so as to break up the original straight lines, as the untouched side of the panel is reached, the pressure on the comb should decrease, and thus subdue the graining. Combing should start at the top and continue in one unbroken stroke to the bottom, keeping an even pressure on the comb, and using the whole width of it. The figure has now to be worked with the aid of a rag wrapped round the thumb, or by the use of the thumb plate, which is wrapped up and used like the finger tip. Perfect mastery of the thumb plate is necessary, using the broad part of the blade to wipe out the highest lights, and the narrow edge to work in the half lights and the finer markings. Treat all of the panels in a similar manner, but vary the grain. The rails and stiles are then grained, but will not call for much figure work as the wood is generally straighter in grain. The badger is used to soften the edges of the graining, and the mottler to soften the veins and to give a more woody appearance to the work. Fine veining can be worked with the veining fitch.

Knots and Surface Markings. The final proceeding is the overgraining and shading, the pigment is ground in water, the colour is spread on a palette and diluted with beer. The overgrainer is dipped in beer and the pigment worked into it. The brush ought to work itself into two or three parts; if it does not, it shonld be combed or worked with the fingers. The colour is applied with a continuous motion from top to bottom. Before the colour is dry work over it with the badger to break up the hard lines. Knots and other surface markings are worked in with the sable pencils and fitches, the whole idea of this part of the work being to enrich the colouring and improve the appearance. A little black or blue can be used sparingly. When the graining is complete the whole surface of the door is varnished.



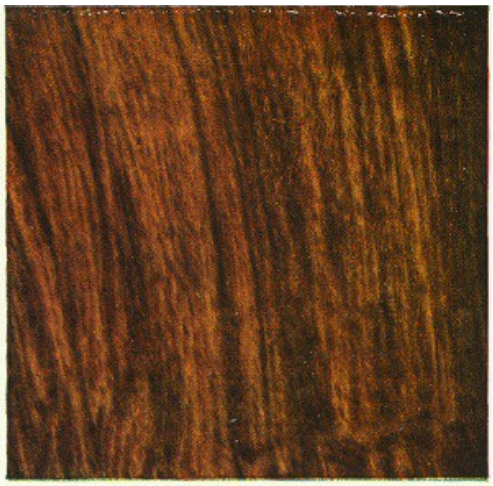
Graining: final stages in preparing a figured oak panel. Left, working in the figure with thumb plate. Right, finishing off and softening with the mottler.

Finely-grained woods may be represented without combs, using brushes only. The grounds are prepared, and the graining colours diluted with beer, the graining

(Continued in page 1001)



Figured Oak



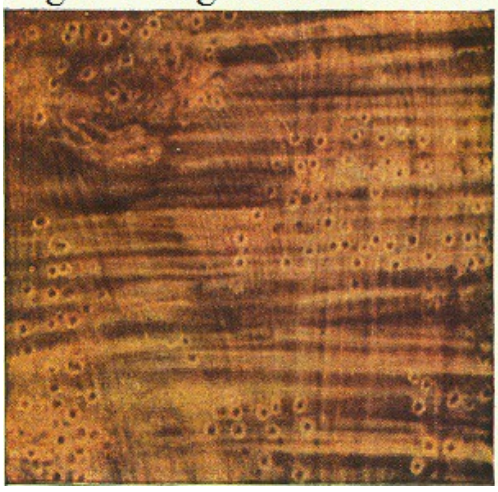
Dark Oak



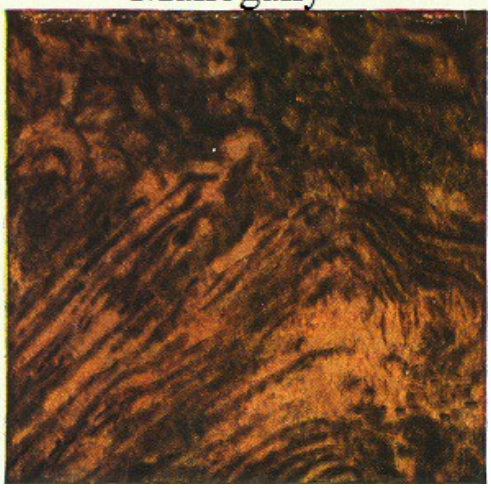
Light Oak grained on Deal



Mahogany



Bird's-eye Maple

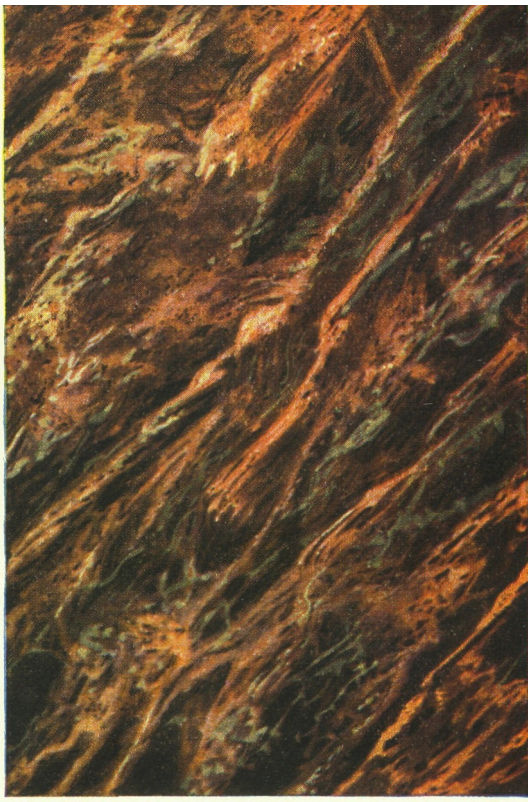


Italian Walnut

GRAINING: SEMBLANCE OF FINE WOODS GIVEN TO DEAL



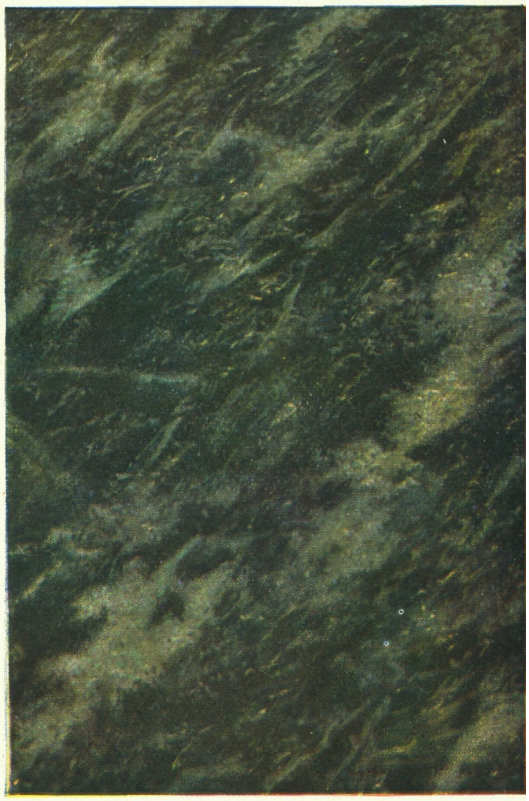
Devonshire Red Marble



Black and Gold Marbling



Siena Marble



Egyptian Green Marble

GRAINING AND MARBLING: WHITE WOOD MADE TO RESEMBLE MARBLE

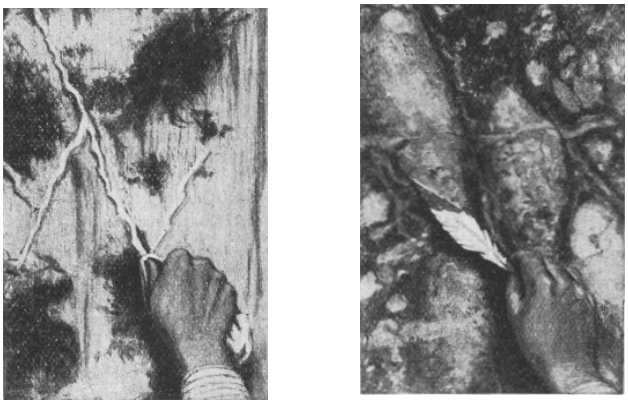
being accomplished with hog hair mottlers, large sash tools, and the fitches and sable pencils. A piece of wash-leather, a sponge and some rag are of assistance, and two or more colours may have to be worked together. The brushes are worked more or less dry, to remove the unwanted colour, as a comb.

Bird's eye maple is grained with the brush, a command of the mottler being necessary. This brush is held so that the bristles separate and break up the straight end; it is held nearly upright, and wiped over the work so that it removes the colour in an undulating manner. Mahogany and walnut require the mottler for the graining colour: the breadth of the veins is varied by altering the pressure of the fingers on the bristles.

Use Of Transfers. Graining by means of transfers is a much cheaper method than hand graining, as the one sheet will give several copies of the design.

The transfer is cut slightly larger than the actual size required, placed face downward on a clean dry table, and the back well damped with a half-wet sponge. The paper is allowed to soak for 3 or 4 min. until the graining print begins to have a glossy appearance. The surface of the material to be grained should be damped evenly by means of a sponge and brush, and the transfer placed face downward on the moistened surface, the back being rubbed evenly by the brush. The paper is removed, and a soft paint-brush, or softener, passed over the surface while the latter is still damp.

Marbling. The processes of marbling are similar to those that are employed in graining, but as marble is a solid substance the colours employed in its representation must be opaque, and most of the effects have to be obtained by a manipulation of the brush. Two of the finishing stages in the process are illustrated.



Graining: Stages in marbling wood. Left, wiping the veins with a thumb rag. Right, completing with a feather dipped in colour.

The ground is worked up and the colourings applied to the surface, the harshness subdued with the badger, and fine veinings worked in with the sable and fitches. The colours may be ordinary artists' colours in collapsible tubes, thinned with turpentine and linseed oil. The colours can be flattened and worked to represent some classes of marble by rubbing them over lightly with a fine rag moistened with linseed oil.

There are many varieties of marble with numerous colourings and surface veinings, all of which can be reproduced after a preliminary study of the natural material, or of reliable coloured photographic reproductions. The amateur is advised to give a sufficient consideration to them until their appearance becomes quite familiar, and then to attempt the actual work on a trial piece of smooth board.

Marbled work should be finished by varnishing with a clear varnish, as a coloured varnish will never look well; the finished surface must be free from any suggestion of brush marks.

GRAMME. A gramme, or gram, is the unit of weight in the metric or decimal system. One gramme is equal to 15.432 grains troy. *See* Metric System.

GRAMOPHONES: THEIR CHOICE AND CARE
Mechanical and Electrical Methods of Sound Reproduction Explained.

This article deals with the various types of instrument and the accessories. A section on Radio-gramophones is followed by one on the construction of a console type cabinet. Consult also the article on Pick-up.

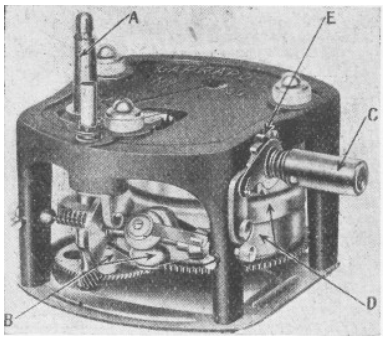
Gramophones may be divided into three main groups according to the style of case or cabinet: portable models, table instruments, and floor cabinets. The method of sound reproduction may be (a) mechanical, or (b) electrical. In the former the movement of the needle as it travels over the track on the record imparts vibration to the metal or mica diaphragm of the sound box; the diaphragm in turn sets up oscillations of varying frequency in the column of air in tone-arm and horn, so that sound-waves are produced. In the electrical pick-up the needle movements produce electrical impulses of varying value in a circuit comprising a low-frequency amplifier and loud speaker.

The mechanism which causes the turntable to rotate may be a clockwork one or an electric motor. To test the quality of a gramophone motor it should be released at varying speeds, with a record on the turntable. A good motor is one which runs evenly, strongly, and without noise. By even running is implied the quality of revolving the turn-table steadily, without jars and tremors; a strong-running motor is one that works vigorously, as though pushing against restraint. A good motor attains the desired speed quickly, and maintains that speed con-sistently without slackening appreciably towards the end of the spring. The sound box should always be tested by playing a varied selection of records, such as a march, a tenor solo, and an instrumental disk. The results from these records will demonstrate the range and power of the apparatus.

A floor cabinet, apart from its value as a musical

instrument, forms a pleasing addition to the furniture of a room. Both cabinet work and internal fittings require close attention, so that a model may not be purchased in which the quality of the mechanism is sacrificed to provide a handsome exterior. There is no danger of this if one of the well-advertised makes of instruments is chosen.

Types Of Motor. A good type of double-spring motor is shown in Fig. 1, the chief parts being indicated as follows: A, main spindle; B, regulating disk and governor; C, winding spindle; D, spring cases; E, winding ratchet. A motor such as this will play the two sides of a 12-in. record with a single winding.



Gramophone. Fig. 1. Garrard double-spring motor suitable for any gramophone. It is tested to play two sides of a 12-inch record at one winding.

In many gramophones an electric motor is substituted for one of the usual clockwork type. Connexion is established very simply by plugging in to an electric-light or power socket. Two kinds of electric motor are illustrated, the universal and the inductively driven. The first is suitable for all voltages from 100 to 250, either A.C. or D.C. The second will run on alternating current only, and is supplied for 100-130 or 200-250 volts. Both comprise an automatic stop. The inductively driven motor has no commutator or brushes, and is thus free from sparking, which, in a radio-gramophone, might be liable to cause interference with reproduction.

Whatever style or quality of gramophone an owner may possess, it needs a certain amount of care if it is to do its work efficiently. In particular, the motor requires regular attention, otherwise it may knock, break down, or at least fail to revolve the turntable correctly. The motor should be oiled and cleaned at regular intervals, according to the quantity of work it has to do. The following procedure is recommended where a motor is in need of a thorough cleaning, which, in many cases, is due to the old oil in the spring-boxes becoming dirty and viscid.

Remove the motor from the case by releasing the turntable and the motor-board screws, the spring having first been allowed to run right down. The spring-box or boxes are placed intact in a vessel containing either paraffin, benzine or petrol, to remove all the old lubricant. If benzine or petrol be used, the operation should not be carried on near naked lights, and is best performed in the open air. If the spring-boxes are allowed to soak for about 24 hours, very little of the former lubricant will be left in the coils of the springs. Meanwhile, the other parts of the motor should be cleaned with a paraffin rag.

Then wipe all the parts as dry as possible, using a clean, non-fluffy cloth. Following this, the spring-boxes are filled with a compound of vaseline and graphite, which may be purchased in a collapsible tube. The easiest way to introduce the compound into the boxes is by raising the cogged plates. The other parts of the motor are treated with a good oil of medium thickness. Light oil should be used for the governor bearings and heavy grease for the cogs. The springs should on no account be removed from their boxes for the purpose of cleaning, except by those who are thoroughly experienced, as it is a difficult task to get them back. When the motor has been assembled and returned to the case, it should be given a good run before the instrument is played, to allow the lubricant to be well distributed.

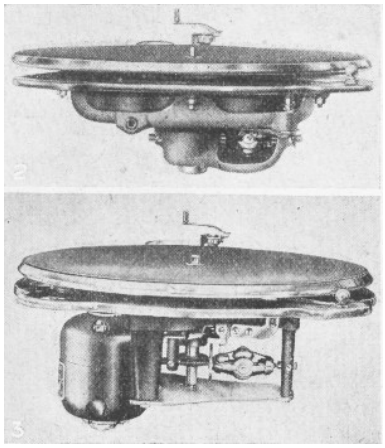


Fig. 2. Example of a Garrard induction electric motor for use with A.C. mains. Fig. 3. Garrard Universal motor suitable for A.C. or D.C.

The Sound Box. This part of the apparatus is almost entirely responsible for the quality of the music, which is reproduced through the vibrations of the diaphragm, usually made of mica or metal. The box, although simple in construction, is necessarily a delicate article, and accordingly it needs careful handling. It should not, for example, be left on the machine when not in use. A good quality sound box rarely needs any adjustments, and if protected from dust, knocks, and harsh treatment generally, it will give good service for a considerable number of years.

Apart from tone, the characteristics of a good box are that the diaphragm is insulated with gaskets, or rings, of good quality rubber; the back of the box fits closely, while the adjustment of the small bar which is attached to the diaphragm is exact, so that the bar does not press upon, nor pull away from, the diaphragm.

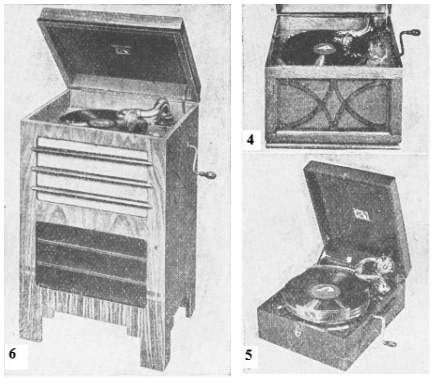


Fig. 4. His Master's Voice table model. Fig. 5, H.M.V. portable model, very useful for out of doors. Fig. 6. H.M.V. acoustic gramophone.

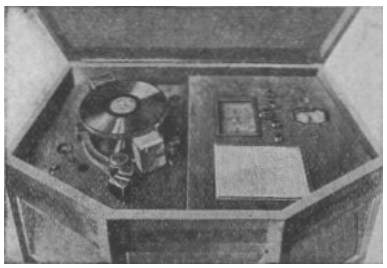
Care of Records. The average record will play quite 100 times without showing appreciable signs of wear. A dustproof case is recommended, as, if records are left exposed to the air when not in use, dust fills the delicate tracks and may destroy the fine tones in reproduction. A flat camel-hair brush also may be employed. It is advisable to brush the baize of the turntable before commencing to play; this baize is a dust-trap which is often overlooked.

Records should be guarded from sudden changes of temperature. The disks should not be left exposed to the direct rays of the sun or within range of the heat of a fire, or they may warp. The turntable should be allowed to reach full speed before the needle is placed on the record, otherwise the first tracks on the rim may become roughened.

Correct Speed. The speed at which records are played has a distinct bearing on the quality of the music, and whenever possible a disk should be played at the speed at which it was recorded. In many cases, this speed is noted on the record itself; in others, it will be found mentioned in the catalogue of the firm concerned. Where the speed is not noted anywhere, 78 revolutions per minute is exactly right for modern recordings.

An automatic stop device is incorporated in some motors, and is also obtainable as a separate unit to be fixed to the motor board. It operates in conjunction with a spiral or elliptical "run-off" or finishing groove on the record.

Fibre needles may be recommended to those who like music with a soft, mellow tone. Fibres have the further advantage that they do not wear out the records as metal needles do. Steel needles afford greater satisfaction than fibre ones to those who like loud, brilliant music. Metal needles, excepting the specially prepared, semi-permanent varieties, should never be used more than once.



Gramophone. Fig. 7. Left: close-up view of its control board, showing automatic record-changer, pick-up, tuning-scale, short wave guide, electric clock, etc.



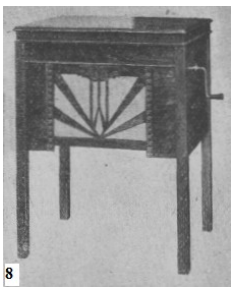
Left: H.M.V. 10-valve All-World Autoradiogram.

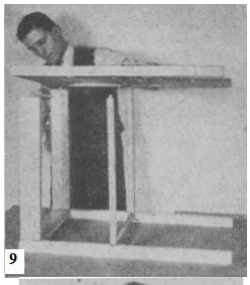
Radio-Gramophones. These instruments are combined wireless receivers and electrical gramo-phones, designed either for battery or mains operation. The equipment normally comprises one or more stages of screen-grid high-frequency amplification, and a detector followed by a low-frequency magnifier. A switch is provided whereby the electrical pick-up can be brought into circuit when required, the apparatus then becoming a straightforward electrical gramo-phone.

Briefly the method of operation is as follows: With the switch in the position for "radio" the high-frequency stage or stages and the detector are connected by way of the low-frequency magnifier to a sensitive moving-coil loud speaker, the receiver then being employed for the reception of broadcasting in the usual manner. When the switch is placed in the "gramophone" position the high-frequency amplifier is disconnected, and the pick-up is connected in circuit with the low-frequency magnifier of the instrument.

The movements of the pick-up needle in traversing the grooves in the record set up small voltages which are afterwards amplified by the low-frequency magnifier to a strength sufficient to operate the loud speaker.

In the case of "all-mains" radio-gramophones the turntable motor is usually electrically driven, and the total current consumed is comparatively small. Electrical gramophones which incorporate a moving-coil lord speaker possess definite advantages over other types. There are also electric record-players which can be plugged into an existing radio receiver with excellent results.









Gramophone. Fig. 8. Console gramophone cabinet. Fig. 9. Assembling the main framework. Fig. 10. Sliding the front fret into position. Fig. 11. The horn being fitted into the centre compartment beneath motor board.

Easily-made Console Cabinet. The light cabinet gramophone illustrated in Fig. 8 is constructed from a parcel of "ready to assemble" materials sold by dealers in accessories for home handicrafts. The home worker with few tools and limited time or opportunity for cabinet work, or one who doubts his ability to prepare

his own timber, will find this type of parcel convenient. The idea is applied also to many useful and ornamental articles of furniture, such as bedroom suites, tables, cabinets, etc.

Accessories for the gramophone include a tone-arm, sound box, and horn. Some form of motor will of course be needed, and suitable types are illustrated on page 1003. A good sound box should be purchased, since the performance of the instrument is dependent primarily on this part of the apparatus. The tone-arm also should be chosen with discrimination, and needs to be fitted carefully. It should move quite easily across the record and must be free from shake or joggle. The internal horn may be built up from plywood, but it pays to purchase a scientifically-designed metal amplifier, which is a tapering horn up to 8 or 9 ft. long, folded upon itself to fit into the small compass of the cabinet. Great volume and pure undistorted reproduction are given by this type. The accessories can be had from most local dealers, or the constructor could write to the firm mentioned above for particulars.

All the parts for making the gramophone have been prepared, the surfaces cleaned up and the joints cut. This leaves the amateur merely the work of glueing up and finishing. The main structure is put together with dowelled joints. The first step is to insert dowels in all the holes in the ends of the rails. The rails can then be regarded as having tenons. To simplify the assembling it is advisable to put the two sides together independently, and allow the glue to set before adding the front and back rails. An advantage of this method is that it enables one to treat the sides as complete units, and avoids the necessity of dealing with many joints in one operation.

Fig. 9 shows the two complete sides being put together by the addition of the front and back rails. When the glueing up is finished the work should be tested for squareness, except where the parts are sufficiently wide themselves to ensure the whole being square. A cramp (q.v.) is extremely useful when glueing up, as it ensures tight joints and enables the work to be held firmly whilst the nails are driven in. It is sometimes necessary to put in nails to strengthen the joints, e.g. where wide rails are used with single dowels. The nails then prevent the rails from twisting. Panels and front fret fit in the grooves in the legs. These grooves are outside the rails, so that the panels can be slid in after the main carcass has been put together. Fig. 10 shows the front being put in place.

The bottom rests on the rails, the corners being cut to fit around the legs. Partitions are provided to separate the motor and trumpet space from the record space at the sides. The back is nailed on. The lid consists of an edging made up from moulding, mitred together. A rebate is formed in the top edges, and the top fits in this. An idea of the interior arrangement is given in Fig. 11, which shows the trumpet being placed in the centre compartment. The motor board rests upon the interior divisions. Holes have to be cut in this to enable the motor and other components to be fixed. Their shape and positions depend, of course, upon the motor and components used. A suitable motor, with all the necessary fittings, may be obtained from a gramophone dealer.

GRANDFATHER CHAIR. This term is applied to a type of antique easy chair found dating from the 17th century, and also associated with Sheraton and Chippendale. In the form in which it is now known this chair was evolved from the one that was provided with ear guards as a protection against draughts. They were made of oak and high, narrow back and turned stretcher connecting the turned legs. Later some were made without stretchers, having cabriole legs.



Grandfather Chair. Chippendale mahogany wing chair covered with tapestry. (Courtesy of Waring & Gillow, Ltd.)

Grandfather chairs made in Queen Anne's time and style, when this type of chair was at its best, have the graceful curvilinear treatment so frequently found on pieces of that period. At this time they were made mainly of walnut. *See* Armchair: Chair.

GRANDFATHER CLOCKS: THEIR CASES & WORKS

For Collector, Cabinet Maker and Mechanic

This contribution deals with the subject from the three points of view enumerated above. For related information see Clock; Pendulum, and the various articles dealing with woodworking.

Long-case clocks, or grandfather clocks, as they are called, were first made in England in the early years of the reign of Charles II. The earliest existing ones date from soon after 1660, and those who possess a specimen of earlier date than 1700 are fortunate. Oak was the material first used for the clock case, but soon walnut came into favour for them, and some of the finest examples are in that wood. Marquetry was introduced into some of the earliest pieces, and there are beautiful clocks decorated in that way in the Victoria and Albert Museum and in other collections, both public and private. In some pieces the marquetry is arranged in panels.

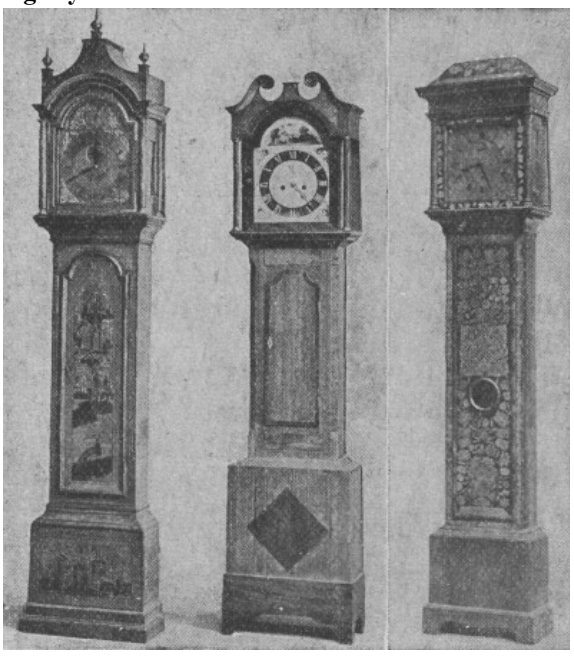
The objects of these clocks was to take the swing of the pendulum, which varied a great deal in length, what were called royal pendulums being up to 65 in. long. The earliest long-case clocks went for a day or rather more, i.e. from 24 to 30 hours; but when the royal pendulum appeared, eight-day clocks began to be made, and have remained popular.

It is common to find the dials of early grandfather clocks furnished only with an hour hand, though the

minute hand was introduced about the year 1690. Clocks about this period which have both are invariably of good make and finish. The single hand was sufficient for clock makers who produced ordinary utility work for at least 100 years after the introduction of the long case.

Most of these early clocks had square dials of rather small dimensions, from 9 to 11 in. across. Early in the 18th century an arched top was made, and this coincided with the form of the enclosing case, for grandfather clocks of the reign of Queen Anne had commonly an arched moulding. The arched top to the door of the case also appeared in the early part of the 18th century, and in some early cases a bull's-eye of glass was put into the door to show the pendulum swinging to and fro behind it, as seen in No. 3 below.

A grandfather clock of the period of William III and Mary would be likely to have elaborate inlaid decoration in the door panel, and also in the base. This form of ornamental enrichment was brought from Holland, and commonly consisted of a conventional rendering of tulips, birds, seaweed, and scrolls. Twisted columns flanking the dial indicate a period about 1700 or slightly earlier.

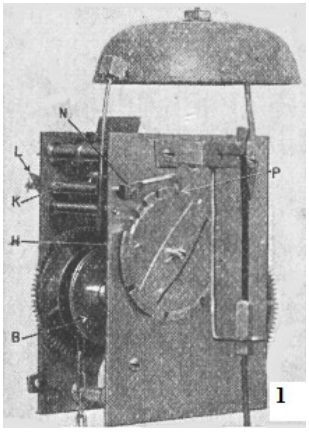


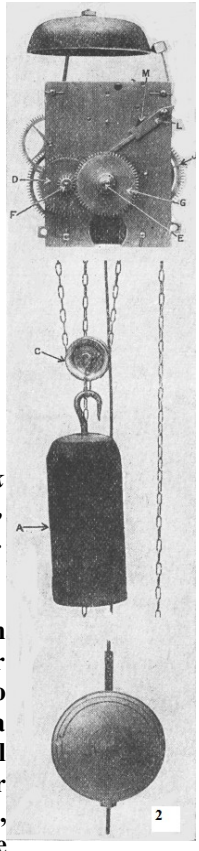
Grandfather Clock. Left to right: 1. Early 18th cent. red lacquer clock, decorated with Chinese figures, chased brass dial. 2. Late 18th cent. clock with canted corners, crossbanded with manogany, painted dial. 3. Queen Anne clock in walnut case, inlaid with floral marquetry, chased brass dial. (Courtesy of Gill & Reigate. Ltd.)

Many cases of grandfather clocks were lacquered from about the reign of Queen Anne, i.e. from 1702 to well on in the 18th. century. Straw coloured lacquer is very rare, red is more frequently seen, and black is commonest. All have Oriental devices in gold. An example is shown in the first illustration.

Chippendale long-case clocks were usually of mahogany and often carved, but his best work was not elaborate, though applied fretwork was seen in spandrils above the arched dial. The horn-shaped top to the hood is considered typical, and the pillars of the front corners of the case are fluted, often having bases and caps of metal. Sheraton designed long-case clocks with delicate columns standing free of the main structure at each side of the dial; the ornamentation is usually of graceful inlaid work. The introduction of cheap American clocks in the 19th century resulted in the practical extinction of the grandfather clock, except as antiques.

The Mechanism. Figs. 1 and 2 show the back and front of the earliest type of grandfather clock, which requires winding every day, a single weight, A, serving both for the going and the striking. In the illustration the two trains of wheels are side by side, but they also may be arranged one behind the other, the striking train being at the back. In some clocks an endless chain is used as shown, and in others a loose mesh rope. Attached to both main-wheel arbors is a deep grooved pulley B with steel spikes set at equal distances, to which the chain or rope grips; the weight hanging on a pulley C supplies the motive power to both trains. The winding is done by the chain or rope. The pulley on the striking mainwheel is loose, with a click attached which works on the arms of the wheel. When the weight is pulling, the click butts against the arm, so pulling the wheel round.





Grandfather Clock. Figs. 1 and 2. Back and front of earliest type of clock, requiring daily winding. (Courtesy of J. W. Benson. Ltd.)

There is no centre wheel and pinion in these clocks. The wheels for carrying the hands are geared up to the mainwheel arbor, forming a compound motion work. A large wheel D attached to the mainwheel arbor works into a smaller one (behind G), which carries the minute hand, the protruding square for the latter being lettered E. On the top of the large wheel D is fixed another small wheel, F; this gears into large wheel, G that carries the hour hand, the combination of the four wheels making a 12—1 ratio.

The striking mechanism, in this case, is a locking plate, that is, a disk geared up to make one revolution in 12 hours, and divided off into varying spaces to mark the number of blows to be struck (H). The pins for raising the hammer are driven into the web of the main-wheel J. There are 13 of them, and 78 blows are struck in 12 hours, a ratio of 6-1 from the main-wheel to the locking place.

Pivoted between the plates is a detent K; fixed to it is a short arm which catches on a pin in the wheel geared next to the mainwheel, and locks the striking train. On one end of this is a lever L, which as the hour approaches is raised by a projection on the minute wheel. This lifts the inside lever clear of the locking pin and sets the train in motion, but it is held again in check by a portion of the lever until the minute hand reaches the hour, when the lever drops and the train is free to proceed. The part of the lever in question passes through a slot in the plate (M).

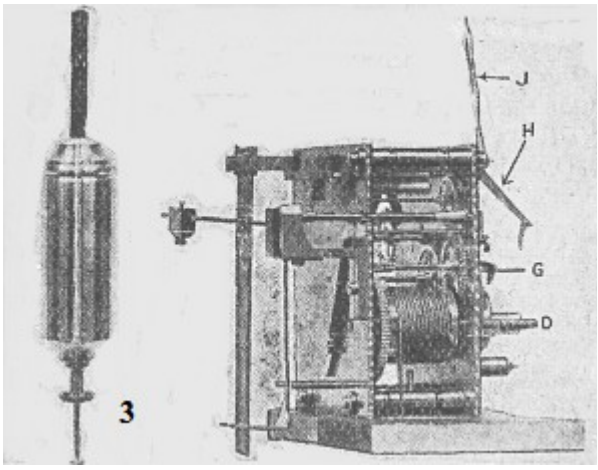
On the back of the detent K is fixed another lever N, which operates on the locking plate. When the striking train is at rest this lever is in one of the slots P. When the clock starts to strike it is lifted out, and as the clocking plate moves forward it holds the lever up until it reaches the next of the slots, which by their varying distances apart regulate the number of blows to be struck when the lever N reaches the slot the lever falls, thus locking the train.

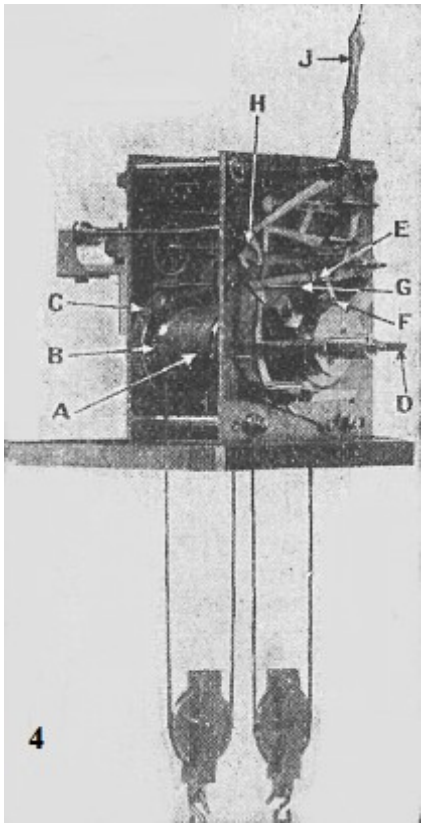
Eight-day Movement. In the clock that keeps going for eight days, two weights are used, with gut lines in the older clocks and wire lines in the more modern. One of the latter is illustrated in Figs. 3 and 4, showing back and front respectively. Reference to the eight-day bracket clock movement illustrated under the heading Clocks will show that the grandfather clock differs from the former mainly in that the motive power is derived from weights instead of springs. The timekeeping mechan-ism and that which operates the striking gear are similar to those of the English bracket clock.

Attached to the mainwheel arbor is a grooved drum A, on to which the line is coiled when the clock is wound up. This is worked with a click and ratchet B, the latter cut on the edge of the drum and the click and spring fastened to the mainwheel C. The winding is done by a key fitting on to the squared part of the arbor D.

The figures show a modern clock movement striking hours and half-hours on a gong. The half-hour striking is controlled by a lever E, which works on a cam on the minute wheel F. At the hour it raises the lever clear of the pin G, and at the half-hour lowers it so that the rack can only use one tooth, striking one blow. There is also a lever H operated by means of an index J on the dial, which shuts off the striking work by holding up the rack at the pin G.

Many clocks are fitted with a calendar showing the day of the month, sometimes by a pointer on the dial; more often there is a slot in the dial through which the date shows, being marked on a circular slide. This slide is operated by a wheel geared into the hour wheel and making one revolution in 24 hours. On the wheel is a pin or nib that moves the slide.





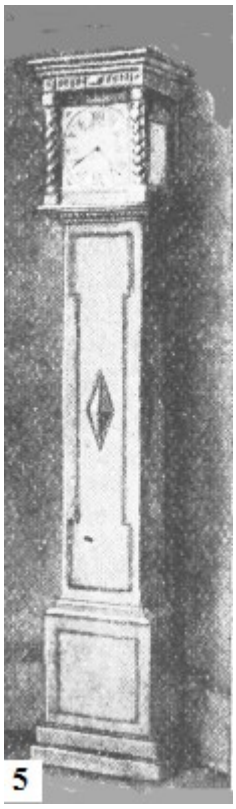
Grandfather Clock. Figs, 3 and 4. Back and front views of eight-day clock, showing mechanism. To left of Fig. 3 is the pendulum. (Courtesy of J. W. Benson, Ltd.)

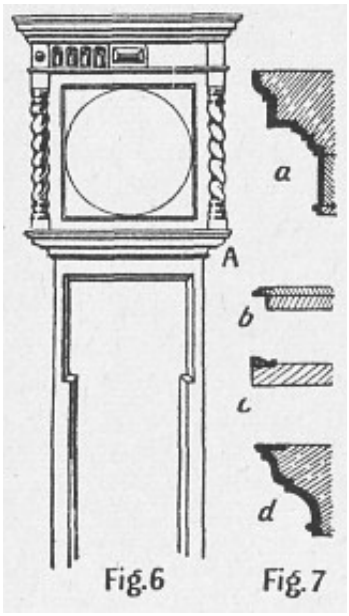
The phases of the moon are shown on some clocks. The moon is painted or engraved on a toothed disk, which works behind the dial, part of which is cut away to show the phases. There are usually two moons on the disk, so that as one disappears behind the dial on one side the other starts to rise on the other side, one revolution of the disk giving the period of two moons. Other types of clock chime on gongs, while some play a selection of tunes.

Making a Clock Case. A grandfather clock case can be made by the amateur who has some skill in cabinet work. Oak is the correct wood for the Jacobean style of case here illustrated (Figs. 5 to 11), but its choice for the highest class of work has been rare. Oak inlaid with mahogany or walnut and ebony bandings is often met with and, at a later date, kingwood. tulipwood and other fancy woods were introduced. Oak is also found veneered with walnut. Maple and sycamore are sometimes met with, in addition to

rosewood, pearwood and ebony. Oak inlaid ebony and ivory dice or herring-bone if the detail is small, has a very neat effect. A quartered oak treatment with diamond centre is also good.

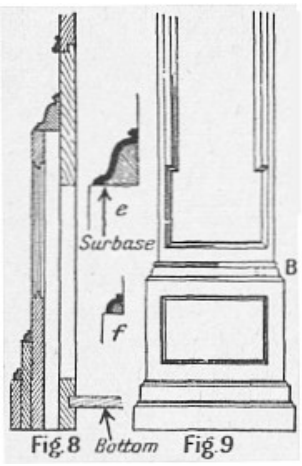
The shaft or pendulum case may be put in hand for a start, and some attention should be given to the jointing in order to assure a good stiff case, as the part sometimes has to withstand a considerable dead weight strain. The worker should select his movement before cutting the case sides or settling the major dimensions, which depend on the type of mechanism, length of drop for weights, swing of pendulum, etc.



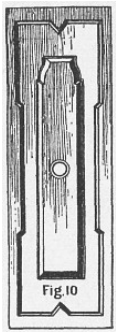


Grandfather Clock. Fig. 5. Jacobean style clock case in oak. Fig. 6. Upper part. Fig. 7. Mouldings used.

The length varies, and it is possible to make a dwarf size grandfather clock to finish about 5 ft. high. In the present case the shaft may be made 3 ft. 6 in, long between A, Fig. 6, and B, Fig. 9, with a depth of 7½ in. The width of the shaft will be governed by the swing of pendulum, a bare clearance being all that is necessary. An average width is about 12 in. to 14 in. The moulding which caps the shaft is built up to a height of 2 ¾ in., an enlarged section being indicated at Fig. 7 *d*. For the shaft the material should finish ¾ in. thick for sides and ¾ in. or ⅞ in. thick for the front framing.



Figs. 8 and 9. Section and elevation of lower part.



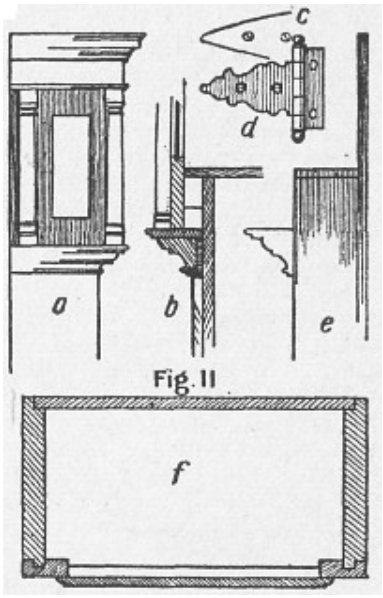


Fig. 10. Alternative door. Fig. 11. Working details. (By arrangement with Evans Bros., Ltd , London)

A plan given at Fig. 11 *f* indicates the sides as rebated for the back to enter flush, or this may be merely screwed to the sides with brass round-headed screws, after bevelling away the edges for finish. The back is continued upwards behind the hood, the latter sliding into position and resting on the moulding which caps the shaft. The sides of the shaft are usually housed into a front framing, as on plan, and glue-blocked neatly in the angles behind. The top rail of front framing, upon which the capping mould is mounted, can be 4¾ in. wide, and the bottom rail, which continues well down into the base below mould B, as shown in elevation diagram at Fig 8. about 8 in. wide. Both are mortised into uprights, from 1½ in. to 2 in wide.

The door, as Fig. 5, and shown enlarged at Figs 6 and 9, has an external break at top and bottom, with moulded edge. It can be made as in the section. Fig. 7 *b*, of ½ in. net thickness, with an overlapping facing of ¼ in. net thickness to form a rebate, and shut over the case front framing. This mould is necessarily shallow, and must be very cleanly worked. It would, in another manner, be possible to rebate in a wider section mould, as in Fig. 7 *c*, on solid ¾ in. material, and afterwards rebate the door to close on to a front framing rebated to correspond. A central diamond, bevelled away to form four facets from a piece ½ in. thick, is mounted on a panel of 1/16 in. thickness, to be glued and fixed in position on door with needle points.

An alternative front is seen at Fig. 10, the central panel, which forms the door, having a shaped and moulded heading. This must be sufficiently wide to give fair access to the pendulum, and is rebated (as Fig. 7 *b*) to shut on to the panelled front. Special hinges for clocks are made with wide flanges after the manner of Fig. 11 *c* and *d*.

The surbase, as Fig., 5, shows 1 ft. 8 in. high over mould B. An enlarged section of this mould is seen at Fig. 8 *e*, the section being 2½ in. high and the

projection about 1¼ in., making the width of surbase 1 ft. 4 in. full. The front is framed up of 3 in. by ¾ in. stiles and top rail, and has an applied rectangular panel, with ovolo-moulded edges, fixed to overlap the opening. A sunk panel could be fitted if preferred. The bottom rail should be sufficiently wide to reach the ground, about 7½ in., the surbase being built out from the shaft sides, which also continue to the ground.

A double plinth 6 in. high is shown, with ovolo mould round each break, ½ in. material being used. A section to enlarged scale of the surbase is given at Fig. 8. It should be noted that the shaft sides are tied by the cross rail behind the front of surbase, and a similar rail at back, in addition to a bottom rail front and back, into which the case bottom is grooved and blocked under. Finishing depth of surbase is 9⅜ in., and at ground the dimensions are 10⅜ in. for the plinth.

The finishing height for the hood, with a 10 in. dial as shown, is 1 ft. 6 in., and width would be about 1 ft. 4 in. An enlarged front elevation is seen at Fig. 6, but, as already suggested, the movement had best be obtained before putting the clock case in hand. The hood portion should project sufficiently beyond the door to allow for the columns. Twist columns are shown, and these will require neatly carving up, as they cannot be turned in the ordinary lathe. Plain columns (as Fig. 11 *a*) can be substituted if the twists present undue difficulty, but the effect will be appreciably less quaint. The columns may either be planted on door front to open with it, or can be fixed on pilasters so that the door can open between the columns.

The front and sides of the hood are preferably tongued together of ¾ in. material, or, in an inferior manner, may be merely glued and blocked together. In blocking, it is best to use sound and well-fitting pine blocks, always cut with the grain to agree with the parts they are to hold. The end of the hood may have a column at the back of the return (as at Fig. 11 *a*), or can finish plain, as Fig. 5, with the end opening glazed. The front opening is the same size as the diameter of the dial (10 in. by 10 in.), with a 1½ in. framing surround moulded ¼ in. ovolo. The columns are of 1½ in. by 1½ in. material. The door will shut upon a similar frame of ½in. thickness, well secured in position by glue blocks behind. The cornice mould can be 2 ⅛ in. high, and, with the frieze will finish a full 4½ in. high to the enlarged section Fig. 7 *a*. The carving on frieze is of simple gouge detail with a 3½ in. bevelled panel applied in centre as a break.

In mounting the movement, this is supported on a seat board or shelf indicated at Fig. 11, *b* and *e*. It is fixed across the upper extremities of the shaft sides, and must be cut out for the pendulum and weight lines. Often an old movement will have the seat board attached, which can be used as a template for marking out another. The movement is held to the board by a couple of hook bolts passing over the pillars of the movement and through the board, where they are secured by nuts. Such bolts can easily be made from stout wire and a screw thread cut on one end.

The capping at top of shaft forms a ledge upon which the hood slides when pushed home in position. A dustboard should be rebated into the top of the cornice. Scrolled detail could be carved on the frieze in place of the flutes shown, or the frieze could be left plain if nicely finished and not too wide. The Jacobean colour is a rich nut-brown, and might be finished with a rubbed treatment.

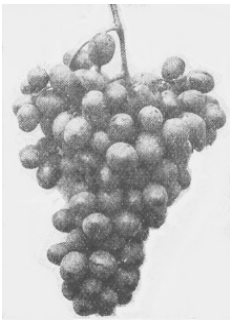
GRANITE. On account of its hardness and durability and its excellent appearance granite is one of the most valuable building materials. It is used extensively in road-making and engineering works as well as in the construction of houses, pillars, tombstones, memorial columns and for many other purposes.

Granite chippings or sand, mixed with Portland cement in the proportion of one of cement to six of granite powder, is useful in repairing a damaged part of a granite face. The same or some similar mixture is employed in the preparation of granolithic concrete, and finishes with a hard and durable surface, the colour of which will be determined by that of the granite used as the aggregate. *See* Cement; Concrete.

GRAPE. The grape is one of the most nourishing and wholesome of fruits. In illness it is cooling and refreshing. The content of nourishing sugar is very high in ripe grapes, ranging from 10 p.c. in some varieties to 30 p.c. in the richer kinds. This compares with an average of 2 p.c. in plums, 6 p.c. in strawberries, and 8 p.c. in oranges. The grape contains ½ p.c. of tartaric acid, as compared with 1 p.c. in apples and oranges and strawberries. The acid is combined with potash, and has a slight laxative effect; it also stimulates the kidneys.

In Switzerland the grape cure is a long-established method of treating corpulence, bronchial catarrh, obstinate constipation, and catarrh of the intestine. The patient eats from 2 to 8 Ib. of grapes per day between meals.

Dessert grapes may be either black or white in colour, many varieties of both being grown, and vary greatly in size, the large ones being the best. The skin should be soft and the seeds few in number. Muscat of Alexandria has the finest flavour. A good bunch of grapes is very thick at one end, and tapers evenly to a point.



Grape. Bunch of the pale variety known as Muscat of Alexandria.

Cooking Grapes. Small green grapes are most used in cooking. To get rid of the tough skin, dip the grapes for a moment into very hot water, after which it will be found to peel off easily. The amount of sugar required depends upon the kind of grape

used, and their ripeness. In early summer, when the bunches on the vines are thinned out, tiny unripe grapes are often on the market. These can be stewed, or made in pies, but as they are very sour plenty of sugar will be required.

Only sound grapes should be pickled, a simple method being to remove the stalks from the fruit and then put it into a clean jar. Cover the grapes with white wine vinegar; then tie them down with a bladder and store them for four or five weeks in a cool, dry place.

Grape Jelly. Black grapes are best for jelly-making purposes if a pretty colour is desired, but green ones also give excellent results. Wash and stalk 2 quarts of grapes, then put them into a pan and bruise them gently over a very low heat until the juice flows freely. Strain without pressing the whole through a piece of muslin, passing the juice through two or three times to clear it. Then measure it, put it into a clean pan, and boil it for 20 min., skimming it if necessary. Add ¾ lb. loaf sugar to every pint of juice, stir the whole until this has dissolved, and then boil it rapidly until it will set when tested on a plate. Put the jelly into jars, then cover and tie it down.

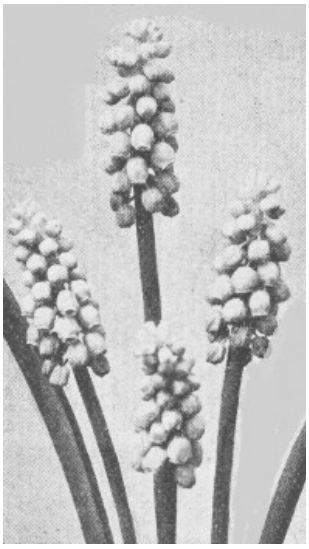
Grape Tartlet. These are made by lining some greased patty tins with short crust pastry, filling them with rice to prevent the pastry from rising, and then baking them until they are lightly browned. In the meantime, make a syrup of sugar and water, making allowances for the fact that ripe grapes are naturally sweet. Flavour the syrup with a little sherry, then peel and stone the grapes, add them to the syrup, and cook the whole for 2 or 3 min. Take the rice out of the tartlet cases and fill them with the grapes and syrup, putting a little whipped cream on top of each. *See* Dessert; Vine.

Grape Scissors. Scissors suitable for cutting grapes are a useful accessory to the dessert service. The best are of silver, and good specimens of the 18th century are in existence. Some of these are beautiful examples of moulded work and chasing. A steel blade will be found inset in some pieces. To-day grape scissors are usually made to match the knives and forks used at dessert. *See* Scissors.

GRAPE FRUIT or Shaddock. Grape fruit, which is procurable during most months of the year, is at its best as a breakfast fruit, to be eaten before the meal, and should be prepared in the following manner: First of all it is cut in half horizontally, using a special cutter or grape fruit knife. The pithy centre is cut out and the pips removed, and finally the knife is passed round between the rind and the juicy fruit, and the latter cut into pieces of a convenient size.

Grape fruit is served in special glasses which can be cheaply purchased. Pointed grape fruit spoons are best used when eating this fruit, and can be obtained in sets. *See* Breakfast; Diet; Glass; Marmalade.

GRAPE HYACINTH. The popular name of muscari, a hardy bulb which bears somewhat grape-like clusters of flowers on stems 6 or 8 inches high in spring. It is very beautiful when massed in the shrubbery or rock garden; it makes a charming picture if planted beneath the golden bell shrub (forsythia), for both bloom together. Grape hyacinths nourish in ordinary soil in sunny or slightly shady places; as the bulbs start to grow early they ought to be planted in September, 3 inches deep and about 4 inches apart. The finest of all is one named Heavenly Blue, a variety of Muscari conicum; the flowers are bright blue. Botryoides is another favourite, with blue flowers; there are white varieties of this and of conicum. Moschatum flavum is yellow; monstrosum bears large inflorescences of pale blue flowers.



Grape Hyacinth. Grape-like flower clusters of this hardy bulb.

Grape Sugar. *See* Glucose.

GRAPHITE: As a Lubricant. Graphite is a form of carbon, very dark and soft, being one of the softest of minerals. It is employed in the manufacture of electrodes, pencils of the better class, and paint, also for making crucibles and for foundry facings, where the heat is intense; but its chief use is as a lubricant.

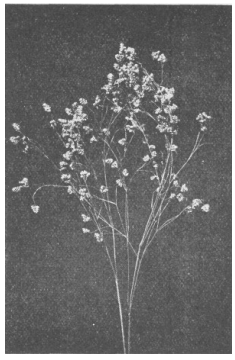
For this latter purpose the graphite should be of a very fine grade, so that it can enter between bearing surfaces without clogging, and be able to float in the oil film between the bearing surfaces. The grade should vary according to the thickness of the oil, a coarser grade being used with greases and extra thick oils. Under the names of blacklead and plumbago graphite is employed with oil in lubricating slow-moving heavy bearings, especially cast-iron bearings, as it helps to smooth the surface of the porous metal. The best proportion appears to be a 4 per cent mixture by weight of oil and graphite.

Various branded and proprietary mixtures of graphite lubricants are on the market and suitable for use on cycle chains, for lubricating motor vehicle and other bearings, and in this form is convenient for domestic use. *See* Bearing; Lubricant, etc.

GRASS: For the Garden. For garden cultivation there are many sorts of grasses which are raised as easily as hardy annual flowers, and can be gathered and dried for ornamental purposes. The following table shows the principal sorts with their height in feet, all being annuals except the last six, which are perennials:

	Agrostis elegans (Cloud grass)	1
	„ laxiflora „ „	1
	„ nebulosa „ „	1½
*	„ pulchella „ „	1¾
	Anthoxanthum gracile (Vernal)	¾
	Avena sterilis (Animated oat)	1½
	Briza gracilis (Quaking grass)	¾
*	„ maxima „ „	1
	Brizopyrum siculum (Spike grass)	¾
	Bromus brizaeformis (Brome grass)	1
	Chloris barbata	1
	„ elegans	1
*	Chrysurus aureus (Golden spike)	½
	Coix lachryma (Job's tears)	1½
*	Eragrostis elegans (Love grass)	1
*	Hordeum jubatum (Squirrel-tail)	1½
*	Lagurus ovatus (Hare's-tail)	1½
	Pennisetum longistylum	1½
*	Arundo conspicua (Silver reed)	5
	Elymus arenarius (Lyme grass)	1
	Erianthus Ravennae (Woolly beard)	1½
*	Gynerium argenteum (Pampas grass)	8
	Panicum altissimum (Tall witch grass)	3
*	Stipa pennata (Feather grass)	2

Of the 24 varieties in the above list 9 are starred as a special selection, 6 of which are annuals and 3 perennials, including Pampas grass. These are the choicest and in most cases also the easiest to grow. Pampas grass (q.v.) is a conspicuous and beautiful object in autumn. Pennisetum longistylum is really a perennial, but generally receives the same treatment as an annual. Most of the ornamental grasses succeed under the same treatment as hardy annuals, sowing in rows or clumps in well-prepared soil outdoors in the early part of April.



Grass. Example of a beautiful and decorative annual grass worth cultivating in a border. (Courtesy of James MacDonald, Harpenden)

Most growers of ornamental grasses want to preserve some of them for vases and table decorations in winter, perhaps intermixed with everlasting flowers. If so, care should be taken to gather them before the seed is ripe. As soon as the flowers have developed, the stems should be cut, because if left till they begin to drop they will not be durable. The stems should be laid out in a dry room for a few days. These grasses may readily be dyed any desired colour for ornamental purposes. *See* Garden; Lawn.

GRASS CLOTH. Grass cloth is made from the long unspun fibres of a plant of the nettle species. Light, fine and silky, but plain, it is a rarity and valuable, deserving of care, although its strength enables it to resist hard treatment. Unlike cotton or linen, it does not contract when it is wetted.

The same fibre of which grass cloth is made is spun and woven in Europe, and sold under the name of ramie or China grass. Often suggested as a substitute for linen, it finds its chief use in incandescent gas mantles, which are knitted from the spun yarn, and then impregnated with minerals.

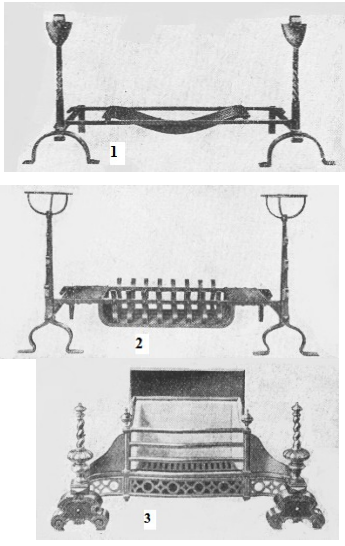
GRASS OF PARNASSUS. The best known member of this genus is Parnassia palustris, a small plant with angular stems, each carrying one heart-shaped stemless leaf and solitary, white, green-veined flowers in summer. It is found on the moors, and is an excellent subject for the bog garden or the rockery, where it should be given a peaty compost.

GRATES: TYPES FOR VARIOUS ROOMS

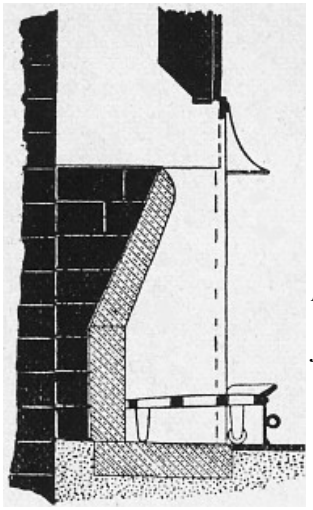
Efficiency and Decorative Values of Kitchen and Sitting Room Types.

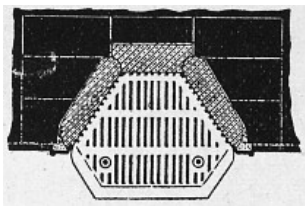
All matters concerning domestic heating are dealt with in this work, and the reader should consult the articles on Adam Style; Central Heating; Chimney Piece; Electricity; Fireplace; Gas. See also Cooker; Flue; Fuel; Hot Water Supply; Range, etc.

The beginning of the grate proper occurred when a basket made of iron was placed in between the two dogs in order to catch falling pieces of burning wood and allow a sufficient air supply to reach them for the wood to burn out completely to ashes without smouldering. This form of dog grate or basket grate is still used for burning logs. Figs. 1 and 2 show two examples, as supplied by the Falkirk Iron Company. The small brackets on the front of the dogs are provided for carrying the spits, or long rods of iron, upon which joints of meat are spitted for roasting. The basket underneath can also be used to hold the twigs and smaller logs used for lighting up the large logs in the first instance. Such a type of grate can also be used for burning coal, and is best suited for country houses with large fireplace recesses and an adequate supply of timber logs.



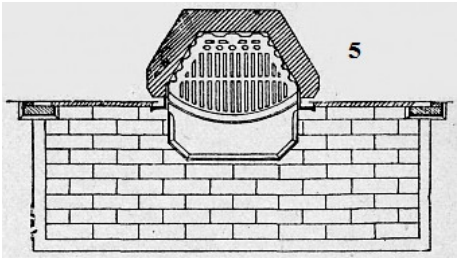
Grate. Fig. 1. Light pattern wrought iron basket grate. Fig. 2. Wrought iron basket grate in a heavy pattern. Fig. 3. Jacobean dog grate with cast iron bars and knobs. (Courtesy of Falkirk Iron Co., Ltd.)





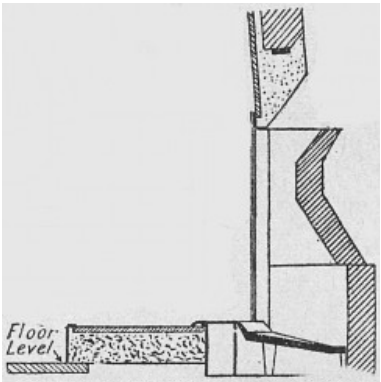
Grate. Fig. 4. Section and plan of a barless slow combustion grate (heaped fire).

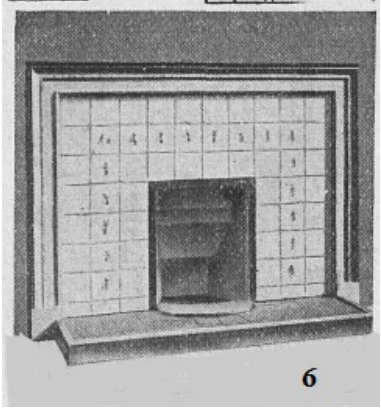
The immediate development of the basket grate was still a dog grate, but the fire basket itself took the form of an oblong box with a solid back and sides, and an iron grating at the bottom of the fire, with horizontal iron bars running along the front. A modern stove of this type, built in the style of the Jacobean period, but with the back and sides of the fire-box lined with firebricks, is shown in Fig. 3. There has been a marked tendency to return to the period form of stove, not only in the case of coal grates, but also with gas-fires and electric heaters, and dog grates of almost any period may be obtained for the use of any fuel.

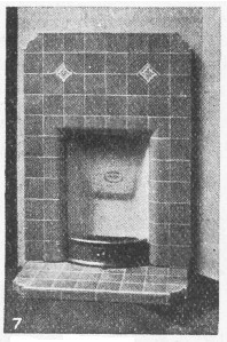


Grate. Fig. 5. Plan and section of the Dipper sunk grate with raised hearth.

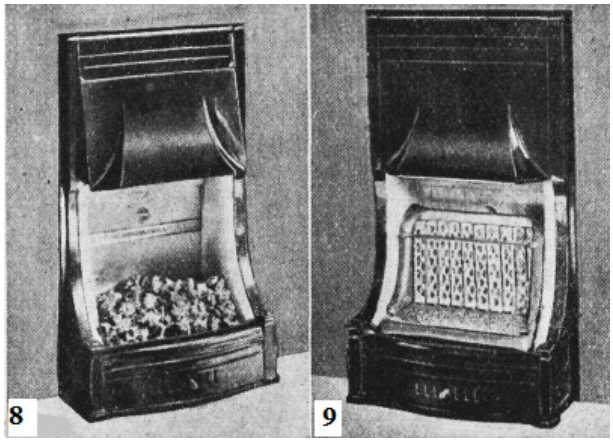
Fig. 6. View of the barless grate shown sectionally above.
Fig. 7. Pyramid fire with independent tile fireplace, suitable for a bedroom.
(5 *and* 6. *Courtesy of Teale Fireplace Co., Ltd.*, 7, *Well Fire & Foundry Co., Ltd.)*







The majority of sitting-room grates are now formed on the slow-combustion principle, and have no bars. In some there is no bottom grate, and the fire burns directly upon a solid block of fireclay. The firebed is often of the well type, sunk below the hearth level. The back and sides, made of specially prepared firebrick, retain the heat and act as an added source of radiation. A barless slow-combustion grate of the kind known as the heaped fire is shown in plan and elevation at Fig. 4, a picture of the grate as set into a fireplace being given in the article Fireplace.



Grate. Figs. 8 and 9. Convertible grate which normally burns solid fuel, especially coke, but which can readily be adapted to gas.

This utilizes the simplest application of the principle of slow combustion, in the form of a metal plate which fits tightly around the front of the grate, and fills in the opening between the bottom grating, which carries the coals, and the hearth itself. It keeps the space under the firegrate hot and heats up the entering air before it reaches the glowing coals. When pushed close up to the grate the plate prevents practically any air from passing into the fire from underneath. In this grate the fire-grating is unattached to the surrounding firebrick. It may be removed entirely during the summer, and be replaced by flowers or any other form of decoration. In other slow-combustion grates the front plate is fretted, and a slide allows the ventilation to be adjusted. Another type of grate is illustrated in Figs. 5 and 6. The fire can be ignited by gas, and in summer may be replaced by an insert gas fire.

In Fig. 7 a "Pyramid" slow-combustion grate is shown, in conjunction with a neat, tiled fireplace which is suitable for a bedroom. This type of fireplace is made in many colourings and in a variety of styles. Figs. 8 and 9 illustrate a convertible grate which normally burns solid fuel, but can readily be converted to gas for occasional use. It is specially designed for coke

burning, having a damper which can be lowered to start the fire. A gas poker connected to a nearby plug-point is used to kindle the coke. For summer months the "insert" gas fire is put in and connected to the supply pipe. Fig. 10 shows a permanent gas-coke fire.

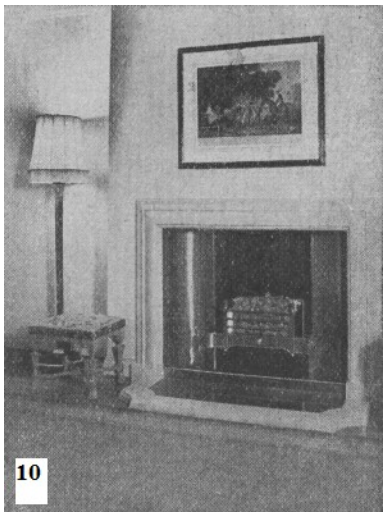


Fig. 10. A gas-coke grate. Quickly lit by gas. which is turned off when the fire is well alight burns evenly without smoke or soot. (British Commercial Gas Association)

An attractive sitting-room grate which presents a cheerful appearance and permits a fair amount of cooking to be done is the solo-oven grate. It comprises a high-pressure hot-water boiler and an oven. Pots or pans may be placed on the hob plate. The ventilating fret, when lifted out and placed on the hob in front of fire, accommodates two extra saucepans for boiling. The handles for the controlling dampers are on the canopy.

Grate Polish. A useful grate polish can be made as follows: Take a cake of blacklead and the same weight in bluestone crystals and mix both to a cream with warm water. When the mixture is cold apply it to the grate with a brush. When the fire is lighted the copper in the bluestone will bake in the blacklead and so form a permanent polish. It should be rubbed from time to time with a soft cloth. Users of this polish should remember that both the black-lead and the bluestone are poisonous.

Another good grate polish is made by mixing ¼ lb. of black-lead with a teacupful of vinegar. Apply this in the usual way and polish with a dry brush. For polished grates, use a paste made from 1 oz. soft soap and 2 oz. emery powder. Lay this on the steel and rub it with a dry wash-leather.

GRATER. In its simplest form, a grater is a small piece of tin through which holes have been pierced, close together, leaving jagged edges. The article to be grated is rubbed up and down the rough surface. Bread, nutmeg, lemon, and cheese graters are those most commonly used, and frequently the three latter are combined in one. In a cheese grater the holes are larger, and smooth edged, having a sharp lip at the base. Graters should be washed in very hot water and dried at once on a soft cloth, as if once allowed to get rusty they are difficult to clean. *See* Cheese; Lemon; Nutmeg.

GRAVEL: Its Various Uses. Gravel, or small stones rounded and smoothed by the action of water, either in rivers or the sea, is used largely in building construction as well as for making garden paths. For the latter purpose shell gravel is frequently purchased, containing varying quantities of broken shell mixed with the stones or pebbles. Gravel is obtainable from builders' merchants or direct from the pits, and is sold in several grades and qualities, such as fine river or coarse beach. The latter, being impregnated with sea salt, cannot be used with cement until it has been washed. Fine gravel is employed for the rough-cast applied as a surface finish on modern cottages. Its use as an aggregate for concrete is dealt with under that head.

In commencing the work of path-making, mark out the path by means of lines secured to pegs and remove turf and top soil to a depth of about 6 in., until a firm foundation is obtained. The trench has to be filled with brick rubbish and covered with a layer of coarse gravel. It has then to be watered and rolled, care being taken to preserve a camber or curved surface. This is covered with a deep layer of fine gravel and again rolled. A certain clay-like consistency ensures the path being properly compacted. This can be detected by the eye and by touch.

Gravel has valuable properties as a filtering medium. A natural water supply such as that from a brook, when diverted and passed through a series of excavations filled with, clean, coarse gravel, will emerge in a practically pure state. *See* Concrete: Garden; Path; Soil.

GRAVES. This is the name of wines grown on the gravelly soil of the Graves district of Gironde, France. Generally of a lively and brilliant colour, with more body than the wines of Médoc, it has bouquet and fineness. The white wines of Graves are an excellent table wine, and are drunk with oysters and fish. There are many varieties. Amongst the most famous are Haut-Brion, Pape Clement, Carbonnieux, Laguloup, Ferrand and du Bouscaut. *See* Wine.

Graves' Disease. *See* Exophthalmic Goitre.

GRAVY. With few exceptions, gravy is the juice of roasted or braised meat, slightly diluted and seasoned, sometimes coloured with browning, but not thickened. That intended for roast meat should be prepared in the following way: Pour off all the dripping from the meat tin, carefully keeping back the sediment and rich brown particles that can be seen under the fat, for it is to these that the gravy owes its flavour and colour. Add a gill or more of boiling stock or water, according to the size of the joint.

Put the tin over the fire and let the gravy boil, stirring and scraping off all the brown pieces from the tin into the gravy with an iron spoon. Skim off any grease, add the necessary seasoning, and strain a little round the meat, serving the rest in a heated sauce tureen. Any bones removed from the meat can be boiled to yield stock, but no other flavouring is used.

The gravy for mutton and lamb may require a drop or two of caramel if it is very light in colour.

Slightly thickened gravy is made as follows: Pour off all except about 1 tablespoonful of the dripping from the tin. Stir into this 2 teaspoonfuls flour, and brown it carefully over the fire, stirring it frequently. Mix in gradually ½ pint of stock, and stir the gravy over the fire again until it boils. Skim and season it, and strain a little round the joint, putting the remainder in a sauce tureen. This gravy must never be thicker than thin cream. *See* Baking; Beef; Browning.

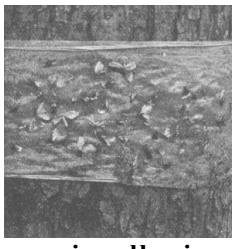
GRAYLING. The grayling is at its best during late summer. For frying, the fish is first washed, scaled, and cleaned, and the fins and gills removed. Dry it thoroughly in a clean cloth, then sprinkle it with seasoning and a little flour, and fry it in a pan of smoking hot fat. When the fish is of a golden brown colour, drain and dish it, using parsley as a garnish, and handing round some melted butter sauce.

If it is to be baked, put the fish, sprinkled with seasoning, in a baking dish, place a few lumps of butter on top, and then cover the dish with a lid. Bake the fish for about ½ hour, basting it occasionally, and just before serving make some sauce by mixing the gravy in the dish with melted butter. *See* Fish.

GREASE. Properly speaking grease is soft, thick, animal fat, but the word is used for oily matter of any kind. The grease that comes from the flesh of those parts of animals that are used for human food, e.g. mutton, is turned into dripping, while many kinds of grease are used for lubricating purposes.

Grease is useful to the gardener. Bands of grease-proof paper coated with grease or some sticky substance are applied to the stems of fruit trees to entrap the winter moth. The female moth, which is unable to fly, crawls up the stems to deposit her eggs and is caught by the grease. The bands may be prepared at home or purchased from horticultural dealers. They are fixed on the trees in autumn.

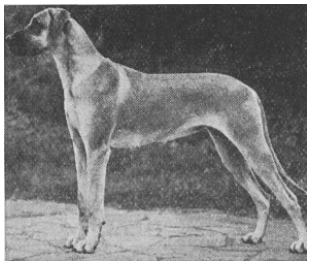
Cart grease may be used, but special preparations made for the purpose are to be preferred. It is impossible to put the bands very high in the case of bush trees on short stems, but on standards they may be placed at any convenient height between 3 ft. and 5 ft.



Grease banding round a fruit tree, with winter moths caught upon it.

It is useless to band trees and leave stakes unprotected. The bands are left on until spring; the grease must be renewed occasionally in winter. *See* Clarifying; Gravy; Lubrication; Oiling.

GREAT DANE. This is a useful dog for those requiring a guard dog that is also reasonably active. It is less heavily built than a St. Bernard, mastiff, or Newfoundland. A buyer should see that its legs are straight, back and front, cow-hocks being a common fault. A long back and weak loins are also to be avoided. The body should be deep and the thighs muscular. The height for dogs should be not less than 30 in. at the shoulders, and the minimum for bitches 2 in. less. The neck should be long and well arched, free from loose skin, and it should carry the head well up, not poked forward.



Great Dane. Champion of this strong, fearless breed. (Photo: Thos. Fall)

The recognized colours are brindles, fawns, harlequins, blues, blacks, the first three being the favourites. When in action the movement should be free and graceful. Usually a Great Dane is docile, but much depends upon his training. He should be kept under control from the first and not spoilt. *See* Dog.

GREEN FLY. The pest known as green fly affects many garden plants. In the greenhouse the pest is easily exterminated by closing all ventilation and fumigating with one of many preparations sold for the purpose.

In the open air, spraying or syringing is the best cure. The best mixture is made up of the extract from 6 oz. of quassia chips, 4 oz. of soft soap, well mixed and added to 5 gallons of water. Paraffin emulsion and dilute paraffin are also efficacious. Abol, Katakilla and many other concentrated insecticides provide con-venient remedies. *See* Insecticide; Rose; Spraying, etc.

GREENGAGE. One of the most delicious varieties of plum; it is self-sterile and uncertain in cropping. It does best on a sunny wall and must be planted near other plum trees, preferably cooking varieties.



Greengage. Fruits of this delicious variety of plum.

In addition to their uses as dessert, greengages are stewed and cooked to form various kinds of sweets, and are also bottled and made into jam. Generally all directions given for the cooking of plums can be safely adopted.

Greengage Cream. A good cold sweet is provided in greengage cream, which is prepared by first rinsing a pretty mould in cold water, and decorating it with clear sweet jelly and fruit. In a basin mix 2½ gills,

sieved greengages, 3 oz. sugar, and the juice of ½ lemon. Dis-solve ¾ oz. gelatine in ½ gill warm water, and strain it into the fruit, etc., adding lightly ½ pint whipped cream, and, if liked, a few drops of green vegetable colouring. Pour the mixture into the mould and leave it until cold, when it is ready to turn out.

Greengage Jam. Choose under-ripe cooking greengages for making this jam. Put 6 lb. of cleaned fruit in the preserving-pan with 1 pint of water, and boil them until the fruit breaks. Remove the stones, cracking some of them and extracting the kernels, and to each lb. of the pulped fruit add ¾ lb. of crushed loaf sugar. Let the sugar dissolve, then boil the jam quickly, stirring all the time, until it jells when tested on a plate. Add the kernels about 3 min. before the cooking is finished. Pour the jam into warm, dry jars, and fasten down at once.

GREENHEART. The wood known as greenheart is extremely hard, heavy, and tough, and close and even in the grain. In colour it is of a dark greenish hue, varying to a very dark centre. Greenheart is remarkably elastic, and is one of the best woods for salmon and trout fishing rods. *See* Wood.

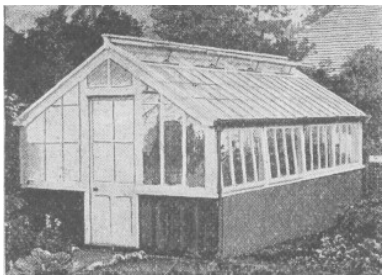
GREENHOUSES: MAKING AND STOCKING
How the Gardener can Make the Most of his Outfit

After some general considerations of design and arrangement, followed by hints on management and lists of suitable plants, the reader is told how to construct a useful greenhouse. See Conservatory; Frame; Garden; Glass, etc.

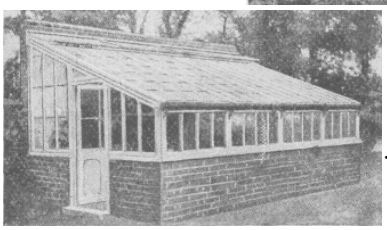
The principal object for which a greenhouse is designed is for the housing of plants not hardy enough to withstand the rigour of winter conditions. Three good types are the warm house, in which a minimum temperature of 55° F. is maintained during winter; the unheated house entirely without artificial heat, and the greenhouse proper, which can maintain a minimum temperature of 45° by means of gas, oil, or hot water. A house of the latter type is considered in this article, giving scope not for the culture of ornamental plants alone, but also for the growing of such profitable crops as tomatoes, cucumbers, etc.

There is variety in the shape of greenhouses, and possibly the most convenient and generally useful type is that known as a span roof, having its roof sloping downward from both sides of the ridge board at an angle of about 45°. Other kinds are the lean-to, a popular and useful structure, and the three-quarter span, a compromise between the two. Each of these types is illustrated, while for the benefit of those prepared to erect a home-made house, constructional diagrams are given.

It should be noted that if a greenhouse is to remain a tenant's fixture it must rest upon the soil and not be fixed to anything built into the soil, neither must its woodwork or other parts be nailed or attached in any way to the brickwork, otherwise it automatically becomes the property of the landlord when the tenancy expires.



Greenhouse. Span-roof greenhouse with wood base, suitable for growing plants of all kinds. (Courtesy of Boulton & Paul, Ltd.)



Lean-to greenhouse with brick base suitable for cucumbers and tomatoes or for plants.

The greenhouse ought to be in a sunny position. A roller blind is usually fitted to provide shade in hot weather, or "Summer Cloud" can be applied to the glass.

Artificial heating is best maintained by hot water, the simplest system being a boiler, plus a flow and return pipe. For small greenhouses a hot-water apparatus heated by an oil lamp is serviceable.

Ventilation should be thorough. A glass-formed structure such as a greenhouse readily admits the sun's heat, but does not readily permit it to escape; thus its quantity must be regulated by ventilation, preferably at the apex of the house. Fresh air is essential to the well-being of plants. When weather is favourable, air should be given freely, day and night, from late May until mid-September, but at other times it should be given only during morning, if conditions are fair, and withdrawn or reduced in the early afternoon at latest. Top ventilators must be opened first, followed by the lower ones, but they should be opened on the same side of the house. Draughts are to be avoided.

Staging, three feet high, usually consists of wooden shelving. It is an advantage to lay thin sheets of corrugated iron or slate on the bench, covering with well-washed sand or gravel.

One of the most useful accessories is a potting-shed easily accessible to the house. It will be handy for storing garden paraphernalia apart from its actual purpose of putting plants into pots, but must contain a well-lighted potting-bench. This may be 3 or 4 ft. long, built at a height suitable for comfortable work. Underneath it should be boarded off into four compartments, to contain leaf-soil, loam, peat, and sand.

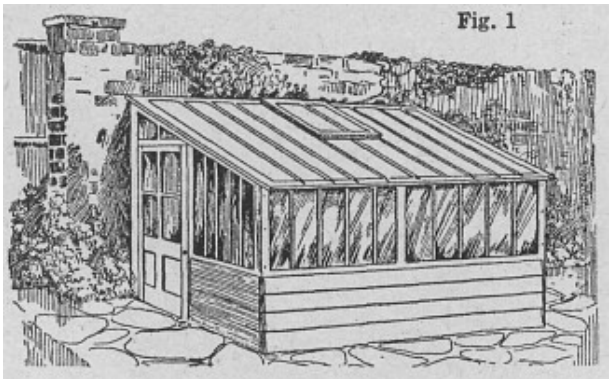
Watering and syringing are both important. A safe general rule is to water sufficiently to reach every particle of root, and then wait until repetition is necessary. The best times for watering are morning and evening, pot plants that have become very dry being placed in a pail of water to soak until bubbles cease.

With a warm greenhouse the gardener has opportunity to raise seedlings for the garden proper; to forward crops of beans, peas salads, onions, etc.; to raise early vegetables; to winter tender plants; to grow cucumbers, melons, and tomatoes, and perhaps to cultivate a vine or peach tree with success.

Chrysanthemums and carnations are prime favourites in the greenhouse, perpetual-flowering varieties of the latter being invaluable. So also are begonias of the fibrous-rooted type, such as Gloire-de-Lorraine, and its varieties Turnford Hall and Mrs. Leopold de Rothschild; others with drooping growth for baskets, like Golden Shower and Alice Manning; together with the handsome-leaved Rex begonias. Among other plants for the greenhouse are coleus, with its very attractive foliage, fuchsias as pot-plants or climbers, hydrangea (hortensia), cherry-pie Lord Roberts, show and fancy pelargoniums for early summer and zonals for winter blooming, scarlet sage for display in autumn and early winter, primulas, cineraria (stellata).

Amongst shrubby plants there are roses. Indian azaleas, genistas, spireas, as well as those old favourites the heaths; whilst evergreens include the well known and easily grown foliage plants, Kentias, fan palms, and aspidistras. To these may be added maidenhair, and other ferns; greenhouse asparagus, sprengeri and plumosus; and the grevillea. Then there is the wide range of bulbs and corms. Lilies, winter-flowering cyclamen, gladioli, freesias, tulips, hyacinths, daffodils, narcissi, amaryllis, gloxinias, and the little-grown, but lovely, nerine.

Unfortunately, plants grown in greenhouses are particularly subject to insect pests, but an occasional fumigation will enable them to be kept in check. Or the plants may be sprayed with an insecticide.



Greenhouse. Fig. 1. Lean-to greenhouse which can be made by following instructions given in the text.

Making a Greenhouse. Fig. 1 illustrates a greenhouse 9 ft. long and 6 ft. 6 in. wide, having a door at one end and a ventilation skylight in the roof. It is constructed by making six distinct frames, which are assembled together by coach-screws or nuts and bolts, and it can be removed easily when desired. The weatherboarding shown on the lower portion is nailed on horizontally, and is preferable to matchboarding nailed on the frames vertically. When natural decay sets in, this generally begins at the bottom of the greenhouse. If the boarding has been nailed on to the frames vertically, decay necessitates taking off and renewing practically the whole of the boarding; whereas, if weatherboards, with their joints running horizontally, have been used, the board nearest to the earth can be readily removed and a new one put in its place.

The foundation may be made of odd bricks, broken stones or slabs, granite drippings and concrete, and it should be the first step towards building the greenhouse. The two end frames are built up out of square-edged timber (that is, timber not rebated on one of its edges). The portions marked S throughout the drawings refer to strips or laths of wood, which are nailed on to the framing to form the rebates which hold the glass, and their width and thickness will be in correct agreement with the rebating of the sash bars.

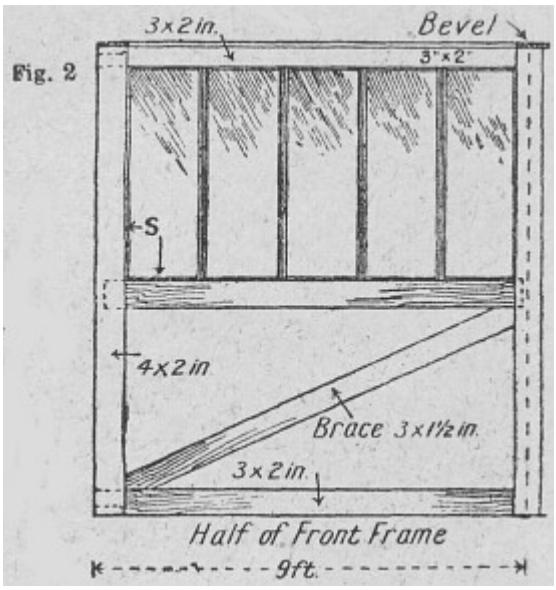


Fig. 2. Part of front before weatherboarding is fixed.

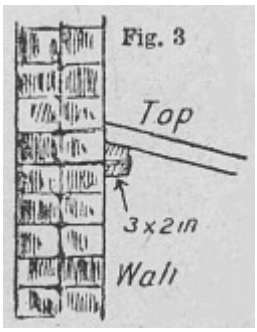


Fig. 3. Fixing spar on wall to support back edge of frame.

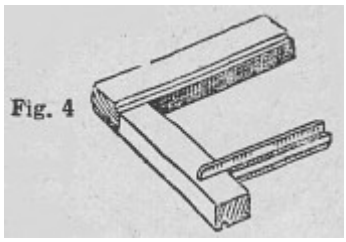


Fig. 4. Bottom corner of skylight frame showing throating to turn water.

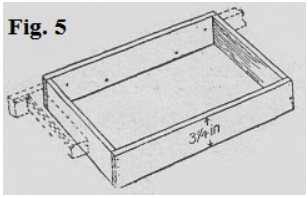


Fig. 5. Curb as fixed in window opening.

The front frame, of which a portion is shown in Fig. 2, is built up in the usual manner by mortise and tenon or half-lap joints. It is stayed by two diagonal braces to prevent it from racking. The top edge will have to be planed or sawn

on the bevel, so as to allow the roof frame to fit and bed upon it. At the back the roof frame is supported by a spar fixed to the wall, as shown in Fig. 3.

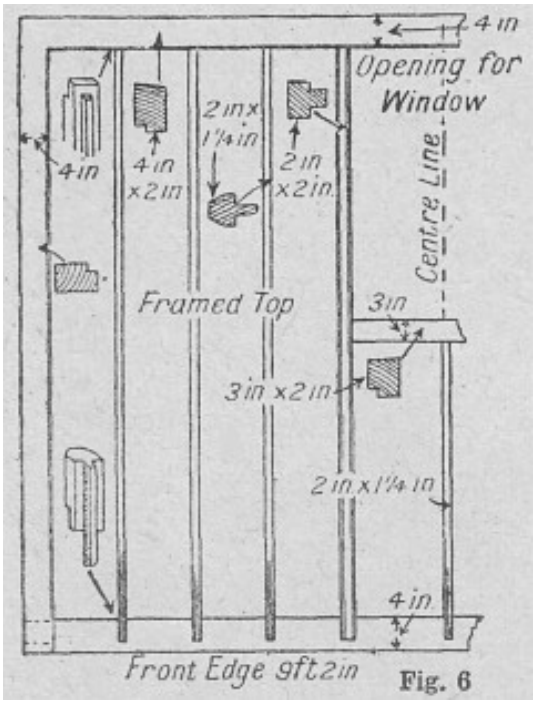


Fig. 6. Half of top frame showing joints and sections.

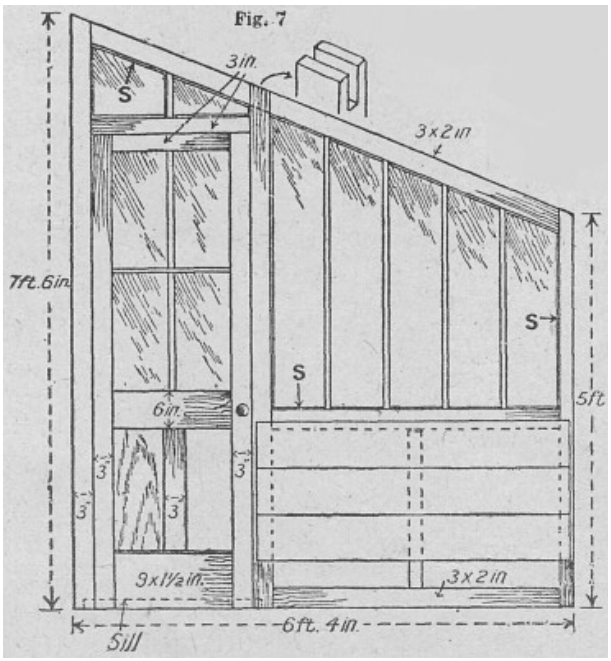


Fig. 7. End frame with door.

The roof frame (Fig. 6), of which a half-plan is shown, will probably be the most difficult for the home worker to make; but, after the experience gained in making the end frames, he will be more confident to tackle it. The joints and details are so clearly shown in the diagram that little in the way of a description is needed, except perhaps to say that a space is left for the ventilator window. Into this space a box or curb is made (Fig. 5), and fitted and nailed in, so that its top edge projects about 1 ¼ in. above the roof frame. This is to throw off the water and keep it out of the joint of the window opening.

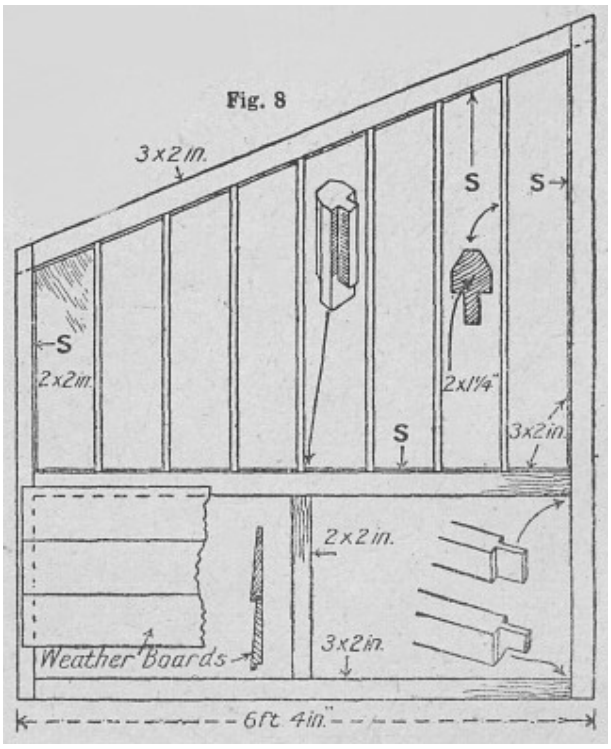


Fig. 8. End without door. The letter S indicates laths of wood nailed to framing to provide rebates for the glass.

The skylight frame is made to project about 1 in. over the curb, and it is throated with a small groove, as shown in Fig. 4, so as to turn the water. The skylight is hinged to the back edge of the curb with butt hinges, and the usual stay rod from the inside of the greenhouse is provided to raise and lower it. The whole of the timber framing should be given one coat of paint before the frames are assembled. This will prevent the new timber absorbing the oil out of the putty, which would otherwise peel off and drop out. Do not forget to make the end frames handed, that is, one frame for the left hand and one frame for the right hand (Figs. 7 and 8).

GREENS. This term is used for green vegetables generally, such as broccoli, cabbage, and spinach. Some people class cauliflowers as greens. *See* Cabbage; Cauliflower, etc.

GREEN TEA. Of the green teas hyson, young hyson, twankay, and gunpowder are the best known, and are chiefly used for blending. The characteristic colour of green teas is due to the particular processes to which they are subjected. These vary considerably from those employed for black teas. For green tea, the leaves of the tea plant are gathered and roasted off at once, before fermentation sets in, while the drying, too, is also specially hastened. From a digestive point of view, the use of green tea is undesirable, as it usually contains a larger percentage of tannin than black tea. *See* Tea.

GREGORY'S POWDER. The common name for compound rhubarb powder is Gregory's powder or mixture, of which the purgative dose is 10 to 60 grains. It is frequently prescribed for acute indigestion in children and is also useful in diarrhoea. Adults suffering from dyspepsia may benefit from small doses, as much as will lie on a sixpence, thrice daily before food.

GRENADIN. In cookery the term grenadin is applied to an oval or round cut from the fillet or cushion of veal. It is usually larded and braised, after which it is garnished and served with sauce. *See* Veal.

GRÈS WARE. This name usually stands for the old stoneware produced in W. Europe during the 16th-18th centuries. Because it was shipped mostly from Flemish ports it was called Grès de Flandres, although the bulk of it came from Cologne and other places in the Rhineland, and some of the best from Nuremberg, Siegburg, and other towns near.



Grès Ware. Siegburg jug with raised designs of hunting scenes. (British Museum)

It was essentially a fine salt-glaze stoneware, in greyish and other neutral tones, with designs in relief based on wood-cut illustrations in books, or the coats of arms of nobles and well-to-do burgesses. The surface resembled orange-skin, and the forms included cylindrical tankards, tall or squat, lidded and handled, sometimes with long oblique spouts.

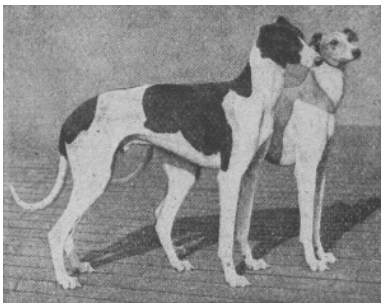
Specimens of Rhenish origin are sometimes unearthed on old city sites in England, because they had a great vogue here until Fulham ware, and afterwards Staffordshire saltglaze, came in to displace them. There are modern potteries engaged in turning out, in the same local white clay, reproductions of favourite old designs. *See* Pottery; Stoneware.

GREVILLEA. The most popular kind is Grevillea robusta, an Australian shrub with decorative leaves, suitable for cultivation in pots, room and greenhouse. It is easily grown from seeds sown under glass in spring and good plants can be grown in 5 in. pots in a compost of loam, leaf soil and sand. The red flowered Grevillea rosmarinifolia, a bush 4 to 5 ft. high, is suitable for planting out of doors only in mild districts.

GREYHOUND. Through being regarded primarily as a sporting dog, with highly specialized functions, the greyhound is seldom kept as a companion, although there are many reasons to be urged in his favour. In outline he is exquisitely graceful, his movements being gentle.

The English greyhound is our representative of one of the oldest canine families. Many thousands are bred annually for the purpose of coursing and track racing. There are not many show kennels, but occasionally a greyhound is exhibited of such perfection that he can be fairly sure of winning the prize for the best of any breed in a show.

There are many colours, all of which are permissible. Although the bigger ones look the most imposing, they frequently lack the power to turn quickly when coursing. Experience commends dogs of medium size, and some of the most famous Waterloo Cup winners have been small. *See* Dog; Italian Greyhound.



Greyhound. Two prize-winning specimens of the famous breed of sporting dog.

GREY MULLET. Of inferior quality compared with the red mullet, grey mullet is, nevertheless, much liked by many, but needs to be very fresh when cooked. Most of the methods which are employed for cooking haddock may also be applied to grey mullet, but sauce should always accompany it. *See* Haddock; Red Mullet.

GRID. This system of national electricity supply, controlled by the Central Electricity Board, consists of a network of main transmission lines to distribute electricity at a standard frequency and take power to areas where it has hitherto not been available.

GRID: In Wireless. This is an electrode of fine wire mesh between the anode and filament (or cathode) of a thermionic valve. The ordinary three-electrode valve has only one grid, as distinct from a screen-grid valve, which has two, and a pentode with three.

The second grid in a screen-grid valve is usually called the screening grid, and this is connected directly to a positive terminal of the H.T. source of supply. In a pentode valve one of the additional grids is connected internally to the filament or cathode. As many as four grids are to be found in some of the modern multi-electrode valves, such as the Triode-Pentode and the Triode-Hexode.

Grid Battery. This is a small dry cell battery employed to maintain the grids of the amplifying valves (sometimes also the detector) at a negative potential in

respect to the filaments, or cathodes. The grid bias value depends upon the type of valve (e.g. its impedance) and the high tension voltage. The correct figure may be ascertained from the maker's instructions accompanying the valve.

Failure to apply the negative grid bias specified will result in excessive anode current consumption, distortion, and possibly loss of emission, i.e., valve failure. Although a grid bias battery is not called upon to supply actual current, it should be replaced about every nine months, or the valve may be damaged.

Grid Leak. This is a high resistance connected between the grid of a wireless receiving valve and a point in the circuit having a positive or a negative potential in respect to the filament or cathode.

A grid leak may be employed to assist in the process of rectification—e.g. a leaky grid detector—or to maintain the grid of a valve at a suitable negative potential, as in a resistance-capacity coupled low-frequency magnifier. No definite values can be given, although 2 megohms is commonly chosen for a leaky grid detector and 0.5-2 megohms for a resistance-capacity coupled magnifier.

A defective grid leak may produce crackling noises, distortion, and sometimes a choking effect on reception, which develops within a short period of switching on the set. *See* further the articles on Detector; Filament; Valve; etc.

GRIFFON. There are several different types of this wire-haired dog with its bearded and moustached countenance. There are longhaired and short-haired, red, grey, fawn black-and-tan; but the favourite is the long haired red, with pug nose and large eyes. The smaller dogs should not exceed 5½ lb. in weight but the larger race may run up to 9 lb. They should not be bought younger than about three months old, for from the age of five to eight weeks their rearing is attended with anxiety At three months the critical time is well over. *See* Dog.



Griffon. Long-haired and pug-nosed specimen.(Ralph Robinson, Redhill)

GRILL. The term is used to describe both the appliance on which food is grilled and the cooked dish itself. Grilling is usually done under the griller of a gas-stove or by a grill or gridiron placed over or in front of the fire. For cooking over the fire, a single row of bars fastened at each end, with a long handle at one end, is used. For grilling in front of the fire, the iron has a double row of bars, enabling the food to be enclosed, while underneath is a shallow trough to catch the fat.

Electric grills on which breakfast, luncheon, or a complete dinner can be prepared are useful table appointments. *See* Bacon; Chop; Cooker; Liver; Mixed Grill; Sausage; Steak.

GRILLE: In Building. A grating or structure of iron or other metal bars, known as a grille, is placed over an opening or aperture generally to prevent any forced entry. Such a grille is made of ⅝ in. diameter iron bars, to bolt over a basement window. Similar structures are often made for the openings in gullies or drains.

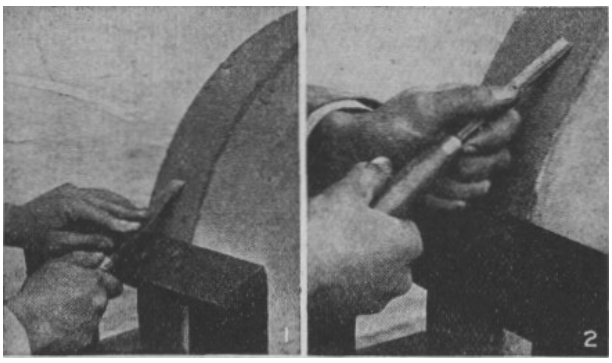
GRILLING. Besides being rapid in its operation, grilling is one of the most wholesome methods of cooking meat, which is exposed directly to the flame. If the process is to take place over or before the fire, the latter must be clear and free from smoke. A gas or electric grill should be made red hot before the meat is put underneath it. The bars of the griller must be greased to prevent the meat sticking. Grilled meat should not be overdone, otherwise it will harden and lose its flavour. It should be brushed over with melted fat before grilling. After cooking, rub it on both sides with butter and season it to taste. The most suitable meats for grilling are steaks, chops, cutlets from the centre of a leg of mutton, and small birds, while the best fish for the purpose are cutlets of salmon, mackerel, trout, and whiting. Fish for grilling should be wrapped in well-buttered thick glazed paper. When birds are grilled they should be cut in half and the inner side first exposed to the fire.

GRILL SAUCE. To make this, place a soup plate over a basin filled to the brim with boiling water. Put 1 oz. of butter in the plate and, when it is melted, stir into it first 2 teaspoonfuls of made mustard, then a dessert-spoonful of French vinegar, a teaspoonful of tarragon vinegar, and lastly a tablespoonful of cream. Season to taste with salt, pepper, and cayenne, and pour over the grilled meat. *See* Bones; Gravy; Sauce.

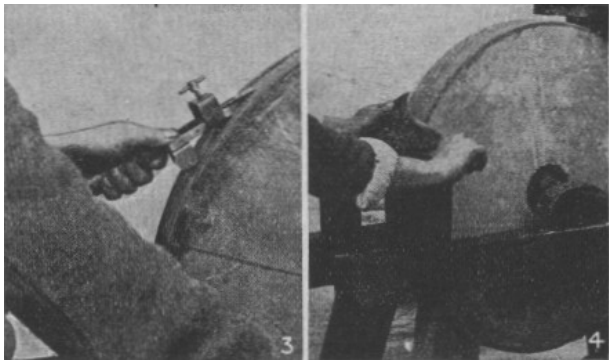
GRINDING: Of the Teeth. In children grinding of the teeth during sleep is most commonly due to indigestion, worms, or some irritating matter in the bowels. It also occurs in nervous diseases, such as St. Vitus's dance. The treatment is that of the condition.

GRINDSTONE: How to Use. A grindstone is an implement used for the sharpening of tools. It comprises a circular stone mounted on a spindle which is supported in a frame; it is adapted for driving by hand or by a treadle. It is an advantage if the frame is enclosed at the bottom to form a trough holding a supply of water to keep the stone wet and to prevent tools from overheating while being ground. The best type of grindstone is one with a cast-iron frame and fitted with a self-contained treadle, and is best fitted with a hood to prevent the water from splashing. Such a stone should be about 2 ft. in diameter and 3 or 4 in.

in width. Smaller grindstones can be screwed to the bench, but they have to be worked by hand, leaving only one hand free to hold the tool being ground.



Grindstone. Fig. 1. Method of placing hands to control a chisel blade and obtain desired cutting angle. Fig. 2. Grinding back of a gouge. Fig. 3. Use of simple tool grinding rest. Fig. 4. Grinding a bill-hook, which is held obliquely across the stone.



Grinding Cutlery. Grinding is the process by which knives and other cutting implements are sharpened on a grindstone. In grinding, the stone revolves towards the worker, the tool-rest being adjusted to the proper angle, and set as close to the stone as possible. This prevents the tool from catching and being dragged down. The stone should never be touched with the hands while it is revolving.

Fig. 1 shows how a chisel is ground. The method is as follows: Grasp the blade in the left hand, with the fingers uppermost, and grip the handle with the right. Incline the tool so that the angle of the bevel is about 20°. The rest should be set to this angle, and the chisel can then rest flat upon it. The tool is not held in one place, but moved about across the rest to avoid forming a groove in the stone. Grinding continues until the bevel on the tool is flat and true. Ordinary firmer chisels are ground on one side only, turning chisels and cold chisels on both sides.

Gouges are ground on the outside, and are held in a slanting position to the stone, as in Fig. 2. The gouge is twisted or turned so that the bevel is ground to a true curve.

Plane irons are treated in the same way as chisels, except that, being broader, they call for more care, especially to keep the edge square with the side of the iron. A spokeshave iron is held in both hands and the face of the iron is ground, very light pressure being needed. With axes and hatchets the head is held in the right hand, the shaft in the left; the head is rocked to and fro on the face of the stone to produce the requisite curved edge.

A valuable aid to correct grinding is the device illustrated in Fig. 3 and known as a grinding rest, consisting of a roller and a tool clamp. The tool to be ground is placed in the clamp and fastened by the clamping screw, with such an amount projecting that when the tool and the wheel are both resting on the stone the angle so formed is that required for the tool. The greater the projection the flatter the angle, and vice versa.

Gripes. *See* **Colic.**

GRIT. Hard, sharp particles of stone, known as grit, are given in bulk to fowls in order to enable them to digest their food. A fowl at liberty instinctively forages for and finds an unlimited supply of suitable material, but in confined quarters the grit has to be provided. The best kind of stone for the purpose is flint, which must be broken to about the size of a pea for adult fowls, and somewhat smaller for chickens. *See* **Poultry.**

GROG. The drink known as grog is made by adding a little cold water to spirits, no sugar being put into the mixture. Sometimes, however, hot water is used, and this also is called grog. The spirit most generally used in making grog is rum, and as the drink is useful for maintaining the heat of the body, it is drunk by sailors and others whose duties compel them to face cold and inclement weather. *See* **Rum.**

GROMWELL. The English name of lithospermum, a beautiful rock-garden plant (q. v.), which is also known as borage-wort. The most useful species, prostratum, is a hardy evergreen trailer, with hairy stems and lance-shaped, hairy leaves, which covers itself with rich blue flowers in summer. It is a beautiful plant for the rockery, where it carpets spaces between large stones, and looks at its best when hanging over them in broad masses.

There is a variety called Heavenly Blue, which resembles the species closely, but is rather lighter in colour. These trailers like a soil of peat or leaf mould and a sunny position. They are lime-haters and are invaluable for hot, dry banks. Other desirable species are graminifolium, which has grassy evergreen leaves and clusters of blue, drooping flowers; canescens, a hoary herbaceous species with yellow flowers, height 9 in.; gastoni, also herbaceous, blue with white eye, an alpine growing about 9 in. high; purpureo-caeruleum, herbaceous, purplish blue, a trailer; and rosmarinifolium, evergreen, blue, 18 in.

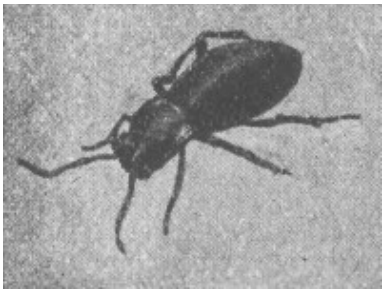
The best of all for the rock garden is L. petraeum, a pretty little bush with greyish leaves, something like the lavender. It is about 9 in. in height, and bears purple flowers from May to July, the blossoms changing in colour to deep violet as they expand.

The gromwells are propagated by seed, cuttings, and

divisions. Seed is sown in a frame in spring. Cuttings are inserted in sand soil in a frame in summer. Division should be practised in spring. *See* Rock Garden.

GROOM. A groom is a manservant who has charge of horses. He should understand the care of horses and be a good rider, as he is often expected to exercise the horses. His duties include, in addition to looking after the horse or horses, the care of the stables and the cleaning of the harness. A male servant licence, which formerly cost 15s. a year, is not now required. He must be insured under the National Health and Unemployment scheme. *See* Harness; Horse; Insurance; Stable.

GROUND BEETLE. Although there are many kinds of beetles that live chiefly underground, the name is applied particularly to a group of 10 species of carabus. They are about 1 in. long, shiny black, in some cases with violet or golden ref1ections, and all wingless. The ground beetle is one of the gardener's best friends, and seeks and devours the fat caterpillars, such as that of the turnip-moth, which destroy vegetables at night. *See* Beetle.



Ground Beetle. Useful garden insect which feeds on caterpillars.

Ground Ivy. *See* Nepeta.

Ground Nut. *See* Monkey Nut.

GROUND RENT. A ground rent is the rent paid for the land on which a leasehold house or building stands. Its amount is fixed when the land is let to the builder, and cannot be altered during the period of the lease, usually 99 years. The owner of the house, not the tenant, is responsible for paying this rent to the ground landlord, and he should deduct income tax at the usual rates from it when he does so. *See* Income Tax; Leasehold; Rent.

GROUND RICE. This is a fine flour-like preparation made from rice. Like rice flour, it is much used in the making of cakes, hot or cold puddings, and for thickening soups.

Ground Rice Cake. To make these, sieve together 3 oz. ground rice, 2 oz. flour, and ½ teaspoonful baking powder. Cream together 2 oz. butter and 3 oz. castor sugar, then beat in 2 eggs separately. Stir in the dry ingredients, mix all thoroughly, put the ingredients into small greased queen-cake tins, and bake in a quick oven for about 10 minutes.

Ground Rice Mould. For this, mix 1½ oz. ground rice to a thin smooth paste with a little milk. Put what is left of 1 pint milk in a pan on the fire, with 1 in. cinnamon. When the milk boils, add the ground rice together with 1 oz. sugar and boil gently for 15 min., stirring all the time. Rinse out some dariole moulds or small teacups with cold water. Take out the cinnamon and fill the moulds with half the rice. Colour the remainder a pale pink with a few drops of cochineal, and fill up the moulds. When set turn them out on to a glass dish and pour custard round. The mixture can also be set in one large mould.

Ground Rice Pudding. Baked ground rice pudding is made by rinsing out a saucepan with water, pouring in 1 pint of milk, and heating until it boils. Then stir in 2 oz. ground rice mixed to a thin smooth cream with a little cold milk. Continue the stirring until the mixture thickens, and then add 1 oz. butter, sugar to taste, and a little vanilla flavouring. Allow it to cool before adding 1 beaten egg. Thickly grease a pie-dish, pour in the mixture, and bake it gently until lightly browned. *See* Diet; Rice.

GROUNDSEL. The wild groundsel, called Senecio vulgaris, is a common weed which spreads very quickly by self-sown seeds. It should be destroyed by hoeing before it flowers. There are some valuable garden flowers in the genus senecio.

GROUSE. These birds, which are in season from Aug. 12 to Dec. 9, may be cooked in a variety of ways, but the most usual method is to roast them. They should hang for ten days to a fortnight before being plucked. All the methods of cooking described under the heading Game (q.v.) can be used for grouse.

GROWING PAINS. The ordinary process of growth causes no pain, and what in children are called growing pains are really manifestations of acute rheumatism and should be treated as such. If neglected, serious implication of the heart may result. *See* Rheumatism.

GRUB: In the Garden. Various garden pests are termed grubs when in the egg or chrysalis state during winter. They are usually just below the surface of the ground, or in the cracks and crevices of the bark of trees and shrubs. Methods of dealing with grubs are explained under the headings of the plants and shrubs which are liable to be infested by these garden pests. *See* Insecticide.

GRUEL. To make gruel, put into a basin 1 tablespoonful fine oatmeal and a pinch of salt. Pour over it 1 teacupful cold water and 1 teacupful milk. Stir thoroughly and let it stand for ½ hour. Stir again, strain, put the liquid into a saucepan, stir till boiling, and boil for 10 min. Serve hot in a soup-cup.

A little cream added last of all is an improvement,

and it may be sweetened with 1 teaspoonful of sugar. If wanted quickly, use 2 tablespoonfuls of oatmeal to the same quantity of milk and water. Stir and strain and make as above. The oatmeal that is left can be used for porridge. *See* Invalid Cookery.

GRUYÈRE CHEESE. This is a large flat cheese, distinguished from others by the presence of large holes, some of which are filled with moisture. It has a nutty flavour.

GUAIACOL. Prepared from creosote, guaiacol is frequently prescribed in consumption. It is given in the form of the carbonate of guaiacol. It has also been used successfully in the treatment of rheumatoid arthritis, but it must be taken for a considerable time.

Guaiacum resin is obtained from the wood of a West Indian tree, Guaiacum officinale, also called Lignum vitae (wood of life), on account of its high medicinal reputation in earlier days. The resin has a mild purgative effect. It was an ingredient of the electuary, known as the Chelsea Pensioner, formerly a favourite remedy for the pains of chronic rheumatism and gout.

GUANO. The valuable natural manure named guano is derived from sea-birds; the chief source of supply is the eastern coast of South America. It is rich in ammonia, phosphates, and alkaline salts. Most of the guano which reaches Great Britain is dealt with in proprietary form, and instructions are issued with it *See* Manure.

GUARANTEE. In English law a guarantee is a promise to be answerable for the debt, default or miscarriage of another. Examples are bank guarantees, in which one makes himself responsible for an overdraft or other advance made to another, and guarantees of debts of various kinds. A reference stating that a person is in a sound financial position is not a guarantee.

GUARDIAN: His Duties. A guardian is a person to whom belongs the care and custody of an infant (under 21). A father is the natural guardian of his child. He may appoint by his will a guardian to act after his death; but this guardian acts along with the mother.

The high court may always appoint a guardian for a child, though the rights of the father and mother are never interfered with, unless for the infant's benefit. If the father and mother separate, prima facie the father has a right to the custody of the children; but the court will consider the interests of the child as paramount and may order the mother to have the custody.

A guardian controls the ward's marriage, to the extent of being able to forbid a marriage without his consent. Anyone who takes a ward out of the guardian's control will be severely dealt with by the court. A guardian must not make a profit out of his guardianship; and may not deal with the ward's property except for the ward's benefit. A guardian must render an exact account when the ward attains the age of twenty-one. *See* Child.

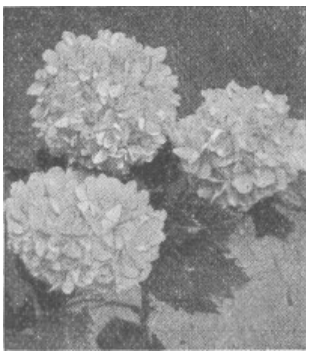
GUAVA JELLY. This can be bought in jars ready for use, or prepared at home from the ripe fruit. Guavas are cultivated under glass in Great Britain, but cannot be imported from the tropics in their ripe state. To make the jelly, peel and cut into quarters about a hundred ripe guavas, wash them thoroughly, then put them into a saucepan with sufficient water to cover, and boil for about 2 hours or until they are perfectly tender, and will break easily when touched. Strain off the juice through a sieve, pressing the fruit so as to obtain as much juice as possible, and if necessary letting it drip for a day or so. Pour the juice into a preserving pan and boil it well, skimming it frequently. Add gradually enough sugar to sweeten it, boil it for a few minutes, then add the juice of ten large limes or lemons. Boil until all the scum has risen and the jelly looks clear; then pour it into clean dry jars, and cover when cold.

Medlars are sometimes used to make imitation guava jelly.

GUDGEON. A small, well-flavoured freshwater fish that is in season from mid-summer until late autumn. The fish should first be cleaned thoroughly, and the gills removed. Use a soft cloth for drying, then dip the fish in the yolk of an egg beaten up with a little butter, roll it in breadcrumbs, and fry it in hot fat. Alternately it may be dipped in milk, coated with flour and fried for 4 or 5 min. in hot butter. Drain the fish on paper, and serve them garnished with fried parsley. Anchovy or shrimp sauce makes a good accompaniment. *See* Anchovy; Fish; Shrimp.

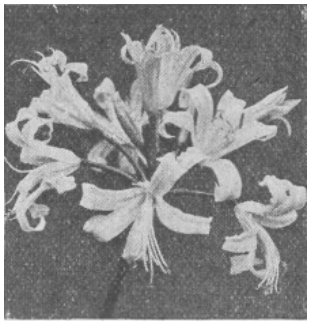
GUDGEON PIN. This is the name given to an axle which turns in a collar. An example is the gudgeon pin which connects the small end of the connecting rod in an internal combustion engine with the piston. *See* Big-End; Motor Car; Motor Cycle.

GUELDER ROSE. The popular name of viburnum, a group of leaf-losing and evergreen shrubs of great garden value. The common wild guelder rose or wayfaring tree is Viburnum lantana which bears flat heads of white flowers in May, and showy fruits in autumn. For details of the best guelder roses for planting in the garden. *See* Viburnum.



Guelder Rose. Flowers of one of the double varieties.

GUERNSEY LILY. The popular name of Nerine sarniensis, a beautiful greenhouse bulb which bears rose-scarlet flowers in autumn. The bulbs are potted in August, and come quickly into bloom. The leaves develop in the autumn and winter months, so the soil must be kept moist during that period. The plants are grown in a sunny greenhouse in a temperature of about 45 degrees. When, in early summer the leaves turn yellow, watering must be reduced gradually and finally discontinued.



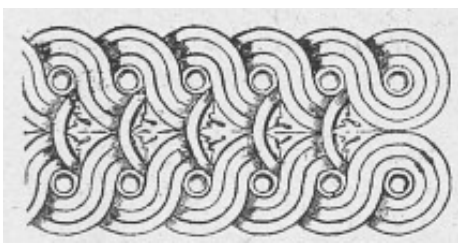
Guernsey Lily, a greenhouse bulb which bears rose-scarlet flowers.

GUEST. The greatest compliment which a guest can pay to a host and hostess is to enjoy himself or herself.

When invited to stay at a house a guest should intimate beforehand the hour at which he intends to arrive, and hold to that arrangement. Throughout his visit he should do his hest to enter into the ordinary family life, thus making his entertainment an easy matter. Tidiness in his bedroom and punctuality at meals will add to his popularity with the household. After his departure he should write a letter of thanks to his late hostess.

Guests should arrive punctually when invited to luncheon or dinner. At an At Home or informal evening party the time may be any convenient hour within certain limits set out on the invitation, but at a bridge party or concert a guest should arrive rather before the time named. *See* Etiquette.

GUILLOCHE. The form of carving known as guilloche is frequently seen on English oak chests of the 16th and 17th centuries. It is an interlaced ornament, of which there are several variations. The most usual is formed by a row of circles placed so as just to over1ap one another, with the wood cut to make the bands which form the rings go alternately under and over each other. In this way they are bound together in plaited formations of strapwork to simulate braiding. *See* Jacobean Style; Tudor Style.



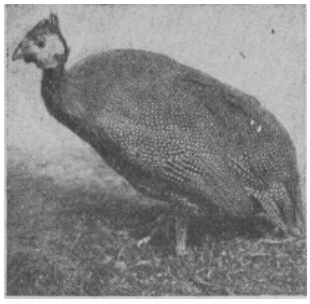
Guilloche. Interlaced form of wood carving seen on antique English oak chests.

GUINEA. The English gold coin of the nominal value of 21s. is now obsolete. Guineas were last coined in 1813, and examples are valued by collectors. Pieces of ½-guinea, 2 guineas, and 5 guineas were also coined. At the present day, although guineas are not used as coins, certain professional fees are reckoned therein. A spade guinea is one, coined in the time of George III, on which the shield on the reverse is pointed at the base, or spade shaped. *See* Coins.

GUINEA FOWL. As its flesh makes excellent eating and its eggs are rich and delicate, the guinea-fowl is a profitable bird to keep. The best plan of securing a stock is to get a sitting of eggs and hatch them out under ordinary hens. The period of incubation is 26 to 27 days. The young birds may be fed in the same way as ordinary chickens.

Guinea-fowls should never be mixed with other poultry, and are best kept in a semi-wild state where they can roost on trees in the open. Their egg is of a coffee-and-milk tint, pointed at one end, and the weight of the bird when rally grown is about 3½ lb.

The flesh of the guinea-fowl, though darker and drier than that of ordinary fowl, is extremely palatable. In taste it resembles pheasant, and is frequently served as a substitute for game when the latter is not obtainable. Almost any of the recipes given for chicken or pheasant may be applied with equal success to guinea-fowl. When the bird is to be roasted, proceed as for roast chicken, tying a liberal quantity of bacon over the breasts and basting frequently to counteract the dryness. It requires about ¾ hour's cooking. Celery sauce makes a good accompaniment. *See* Chicken; Pheasant.



Guinea Fowl. Profitable bird for the poultry keeper, both its flesh and eggs being excellent for the table.

GUINEA PIG. Guinea pigs can be kept comfortably in a more confined space than rabbits, and are generally run in pairs. The period of gestation is 9 to 10 weeks, and the number of young at a birth seldom exceeds five. Little guinea pigs are very precocious.



Guinea Pig. Small animals which are popular pets with children. A great variety of colouring and marking is obtainable in the short-haired breed.

The dietary of a guinea pig consists of any kind of

greenstuff, and in the way of solid food a mixture of ⅔ bran and ⅓ sharps. They are also partial to bread and milk. Water to drink should always be within reach. Good animals of a prize strain have a fair market value. *See* Rabbit Hutch.

GUITAR: How to Play. The guitar is one of those instruments which have a fretted fingerboard, and are played by plucking the strings with the fingers. Its parts are, firstly the body, the back and the sides of which are of maple, ash, or cherry wood, and the face or sound-board of deal. The sound-board is pierced with a large round pound-hole in the middle of the narrowest part, or waist, of the guitar.
(See next page for diagram of guitar fingerboard and corresponding notes.)

Secondly, there is the neck, the upper side or fingerboard of which is of some hardwood like ebony or beech: upon it are the frets, arranged so as to give a succession, of semitones. This terminates in the head, holding the six tuning pegs, which are now metal screws, three on each side.

The strings are carried from these pegs over the nut to the tail piece, which is fixed at the farther end of the sound-board. They are six in number, the first three being of gut, the others of silk spun over with fine wire, and they are tuned in fourths, except between the 2nd and 3rd, where there is the interval of a third, as shown in the diagram. These are the real sounds, but it is customary to write music for the guitar on the treble stave, an octave higher than the actual pitch. Tune the sixth or lowest string to agree with the corresponding note on the piano, or whatever instrument is to be used in conjunction with the guitar, and from that tune successively the other strings. Let the thumb and first finger of the left hand encircle the neck behind the first fret, the other fingers suitably curved being held over the strings. The body of the guitar is kept in position by firm pressure with the inner part of the right arm. The little finger of the right hand rests upon the sound-board, midway between the tail-piece and the sound-hole, the other fingers being used to pluck the strings, the lowest three by the thumb, and the 3rd, 2nd and 1st strings by the 1st, 2nd and 3rd fingers respectively.

Initial practice will consist in plucking only the open strings in varying order. When facility in thus finding the strings has been attained, it will be time to proceed to the stopped notes, to produce which the finger is pressed firmly upon the string just behind the proper fret. A table of fingering is given in every tutor for the instrument; it is sufficient to say here that to reach the higher frets it is necessary to shift the left hand up the neck.

When the first finger is in its normal position behind the lowest fret, the hand is said to be in the first position; when the hand is shifted so that the first finger is behind the second or third fret, it is in the second or third position respectively. It will be found best to shift after playing an open string.

After use, wipe the instrument with a soft duster, to remove any traces of moisture from the warm hand, and put it away where it will be protected from dust.

GUM. Gum is a vegetable product from trees, which forms mucilage when dissolved in water. The chief gum is that obtained from the acacia tree, known as gum arabic. When dissolved in water in the proportion of gum 1 oz., water 1½ oz., a thick liquid is obtained which is employed as an adhesive. When the best quality gum arabic is used the resulting mucilage is taken internally as a soothing medicine for severe coughs and sore throats.

In making mucilage cold water is poured over the solid gum and allowed to remain for a few days, then, on stirring, the gum readily dissolves. If hot water is employed the mucilage soon becomes mouldy. To preserve mucilage intended as an adhesive it is necessary to add to it a small proportion of clove oil or formalin.

GUMMING. The formation of a semi-transparent exudation upon the bark of fruit trees is usually a sign that the trees have been over-pruned and over-manured. The gum may be scraped away and the affected parts washed with soft water. *See* Fruit.

GUMS: Their Care. The bone of the jaw forms sockets in which the teeth are placed, and the gum is closely adherent to the outsides of this bone. When healthy it is of a pale pink colour, and its margin is firmly applied to the necks of the teeth. When inflamed it becomes somewhat swollen and deeper in colour, and is liable to bleed on being rubbed with a toothbrush.

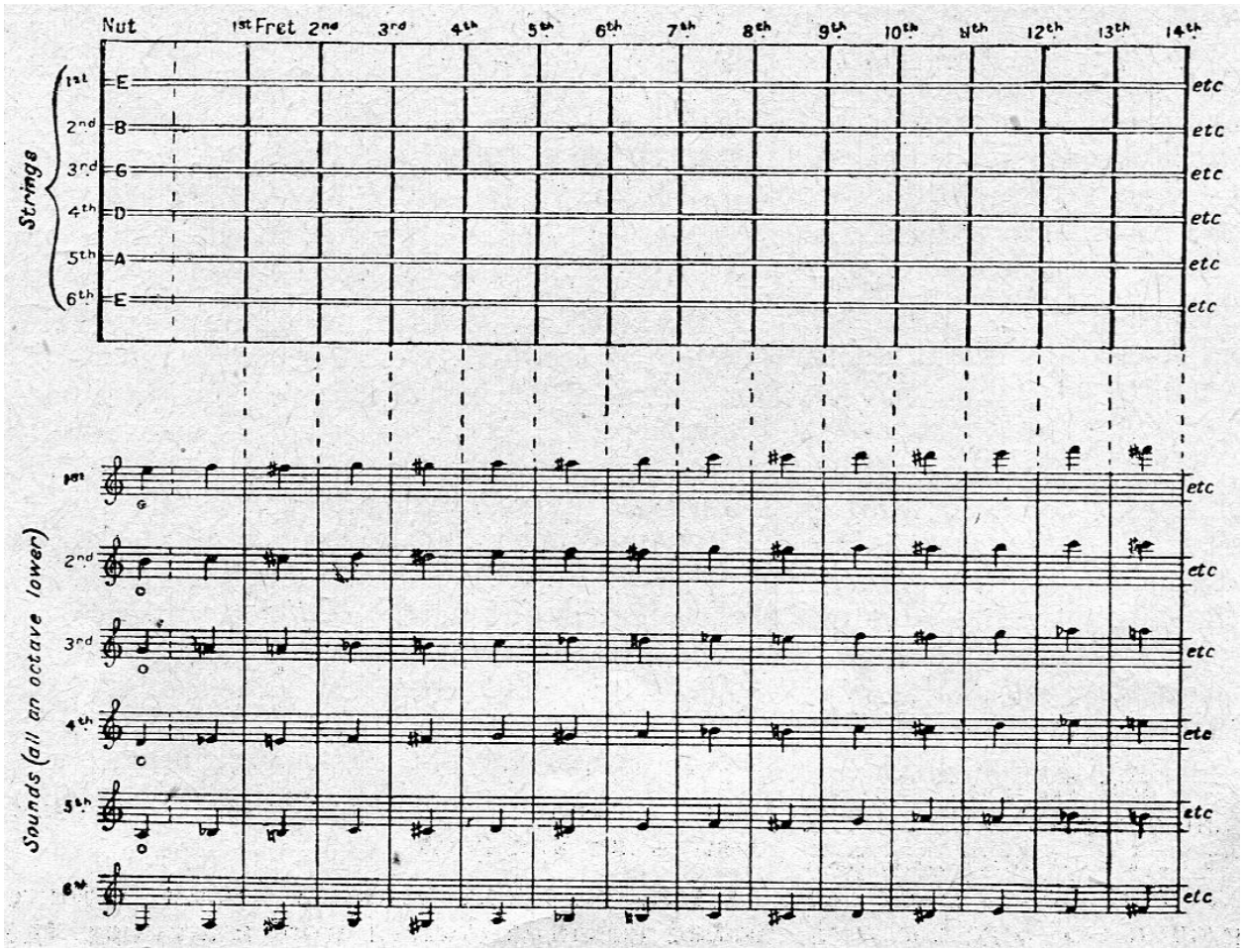
In ordinary cases trouble with the gums generally arises from neglect of the teeth. Regular daily brushing and rinsing the mouth with a teaspoonful of alum in ½ pint of water will soon restore the gums to normal health. In pyorrhoea the gums become chronically inflamed along the margin, the edge of the long sockets of the teeth become carious, and pus is formed.

Gum Rash. A pimply skin rash occurring in infants is known as gum rash, red gum, or tooth rash. It may consist of red pimples, or paler papules somewhat resembling flea-bites, or circular patches developing chiefly on the face, arms, and neck. The rash is usually due to some temporary upset of the digestion during teething-time. No treatment is required other than strictest attention to the cleanliness of the baby's bottles and to the state of the bowels. The child should not be allowed to scratch the pimples.

Gumboil. This is a painful swelling in the gum and generally occurs over the diseased root of a tooth, and is caused by the exudation of septic matter from the end of the root.

If there is a cavity in the tooth it may be temporarily filled with a piece of cotton wool dipped in strong carbolic acid and well squeezed out. The squeezing

(*Continued in page 1025)*

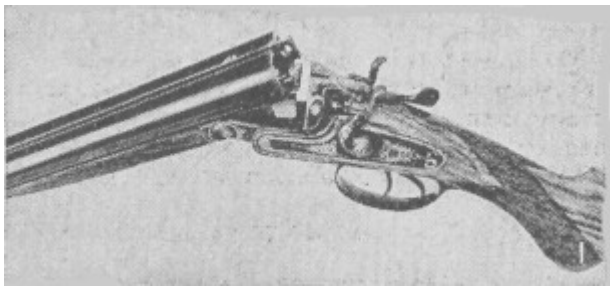


Guitar. Diagram of guitar fingerboard and the corresponding notes.

should be done with a tight wad of cotton wool to protect the fingers. If a gumboil has formed the matter should be let out. Fomentations or a hot bag to the face may give temporary relief, but should not be persisted in for long. A dentist should be consulted. *See* Pyorrhoea; Scurvy; Teeth.

Gum Tree. This is the popular name of the eucalyptus (q.v.).

GUN: For the Sportsman. The essential parts of a gun are the breech, into which the cartridge is inserted, the lock mechanism, to explode the charge, the barrel or tube which directs the shot, and the wooden stock, which rests against the shoulder when firing and is held by the hands. Unlike the rifle, with its spiral grooves, the barrel of the shot gun has a smooth bore, as scattering shot is generally employed.



Gun. Fig. 1. Double-barrel shot gun.

Sporting guns are made in two main types. These are the hammer guns, as in Fig. 1, which have exterior arms, known as hammers, which are cocked, or set in position for firing, by drawing back the hammer until a ratchet device holds it in position. It is released by pulling upon the trigger: a powerful spring then drives the hammer forward and causes it to strike against the firing pin. The latter is driven against the percussion cap formed in the centre of the cartridge, and thus explodes the charge. The other type is known as hammerless (Fig. 2), because they have no exterior hammers, these parts being enclosed in the frame of the gun. With this type there is less risk of accident.

The lock mechanism is contained in the frame, to one end of which the barrel is fitted, while the stock is bolted to the other. The locks of the hammerless gun are cocked by means of a piece of mechanism which operates when the breech is opened. The barrels are fitted to the frame by means of a bolt operated by a lever on the top of the frame. The size of the barrels varies according to the purpose for which the gun is required and to the individual taste of the purchaser. For all ordinary sporting purposes No. 12 bore will be found satisfactory; for ladies a No. 16 bore will answer well; while a No. 20 can also be used, and is very handy for short ranges.

With double-barrelled guns it is the general rule that one barrel, usually the left, should be choked, that is, tapered slightly towards the tip or muzzle. The first trigger on the gun is that of the right-hand barrel; after firing this at a moving target, the left-hand barrel can be fired at a longer range, the choking of this giving the extra few yards required to make the shot effective.



Fig. 2. Anson & Deeley double-barrel hammerless gun.

To prevent accidents, various devices have been adopted. These generally consist of a trigger bolt fixed in a vertical position in the frame by pivoting it, and a slide attached to the upper part of the lever on the tang to the back of the top lever which opens the breech. As the slide is pushed, the lower end of the lever is brought close up against the triggers, thereby blocking them and preventing them moving when the safety catch is in the safe position. When the gun is to be fired, this slide must be pushed in the opposite direction so as to bring the lower end away from the triggers. Automatic devices are also employed to prevent accidental discharge.



Fig. 3. Simple type of sporting gun. (Courtesy of The Midland Gun Co., Birmingham)

Other types of sporting guns include a small rabbit, or saloon gun (Fig. 3), firing a B.B. cap consisting of a single-ball cartridge. These guns are often fitted with bolt action. The cartridge is inserted between the head of the bolt (when the latter is withdrawn) and the entrance to the breech, and is placed in its firing position by pushing the bolt home.

When not in use any cartridges left in the gun should be withdrawn to prevent accident. Provided it is properly cared for a gun will last a lifetime. It should be coated with a fine film of oil and stored in a dry place, the oil being wiped off when the gun is required. After use it should be taken to pieces, the fore-end taken off and the barrels removed from the stock and thoroughly cleaned, taking special care to get the bore quite clean and dry. If the barrels are exceptionally dirty, pour hot water down them from breech to tip, and thoroughly clean and dry them with a pu11-through or other available means. Gun repairing should be entrusted to a gunsmith.

Gun Licence. A licence duty must be paid by any one who carries a gun. The licence, which costs 10s., is obtainable at any post office. Certain persons are exempt, e.g. anyone who has a game licence or certificate, and the owner or occupier of lands who

carries a gun for the purpose of scaring birds or killing vermin.

By the Firearms Act, 1937, no firearms (except a smooth-bore shot gun at least 20 in. long, or an air gun not declared to be dangerous) or ammunition may be possessed by anybody unless he holds a certificate granted by the chief officer of the police in the district where he resides. The certificate costs 5s. and the cost of renewal is 2s. 6d. It must be renewed every three years. It should be noted that the possession of a police certificate does not absolve the holder from procuring a gun or game licence. No one may sell a firearm to a person who does not produce a certificate for it. The vendor must take his customer's name and address and notify the police.

A licence to shoot or take game costs a sum varying from £3 to £1, according to the period for which it is required.

GUN METAL. This is an alloy consisting of about 90 per cent of copper and about 10 per cent of tin, with small quantities of iron, lead and zinc. Originally used for ordnance, gun metal is now employed for bearings and other mechanical parts. It is extensively used in ships, in the manufacture of valves and other fittings which are exposed to the action of the sea. The amateur will find it of service in the form of small castings and rods.

In model construction, gun metal forms the principal metal of which the small castings for the different parts are made. It is also utilized in hydraulic fittings such as pumps. Gun metal is deep yellow in colour and is machined, polished or lacquered as for brass.

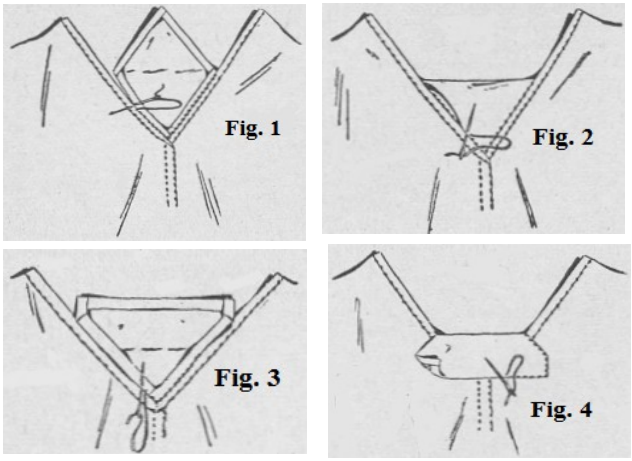
GUNNERA. The two species manicata and scabra of this large-leaved, decorative foliage plant have enormous rhubarb-like leaves. The gunneras are nominally hardy, but it is desirable to cover the rootstocks with leaves or litter in winter. They like a deep, fertile soil, with plenty of moisture. The crowns can be divided in spring if more plants are wanted.

GURNET. This fish needs first to be cleaned thoroughly, and after the fins and gills have been removed it is placed in a pan containing boiling salted water, and cooked gently until done. An average-sized gurnet, which is sufficient for 3 persons, requires about ½ hour's cooking. It may be served with anchovy, caper, parsley, or any other suitable sauce. If liked, the fish may be stuffed with veal forcemeat before being boiled.

Baked gurnet is prepared by filling a cleaned fish with veal forcemeat, sewing it up, and then trussing it with the tail in its mouth. Put it into a baking-dish with one or two thin slices of bacon laid over it, and bake it for ½ hour or more, according to size, in a hot oven. When cooked, it can be served with a sauce prepared as follows: Put 1 tablespoonful chopped onion into a stewpan with the same quantity of vinegar, cook these over the fire for a few minutes, then add ½ pint melted butter, 2 tablespoonfuls of ketchup, and the same quantity of water. Cook the sauce until it is reduced and slightly thickened, then season it with a little pepper and add the fillets of an anchovy cut into strips. *See* Fish.

GUSSET: How to Insert. In dressmaking the piece of material termed a gusset is inserted at the junction of two seams of a garment to give more spring or freedom of movement at this point. It may also be inserted at the end of an opening in a seam, to prevent any strain from splitting the seam open further.

There are two types of gussets which can be inserted at the end of an opening terminating a seam, such as at the base of the sides and sleeves of men's and boys' shirts, the most generally employed being the square gusset illustrated in Figs. 1 and 2. To make such a gusset, cut a piece of material from 2½ to 3 in. square, turn down all the edges to the wrong side about ¼ in., then fold the gusset in halves, trianglewise, and crease the fold well. Open the gusset, set one point to the end of the opening in the seam, and neatly oversew the two sides of one half to the sides of the opening, which should first have been neatly hemmed, as in Fig. 1. Fold the gusset over at the crease-line, and hem the remaining two sides down to enclose all raw edges, as in Fig 2.



Gusset. Methods of inserting a piece of material to give strength. Figs. 1 and 2. Square gusset. Figs. 3 and 4. Triangular gusset.

The second type, known as a triangular gusset, is shown in Figs. 3 and 4. For this, cut a piece of material about 2½ in. square, fold it trianglewise, and cut through the fold to obtain two triangular pieces. Take one of these sections, and turn all edges down to the wrong side about ¼ in., turning in the cut edge first, then cut away the extending side points of this edge, and turn in these edges.

Fold the remaining point of the gusset up to reach the fold of the straight edge just mentioned, and crease the fold well. Open out the gusset, set the point to the end of the seam opening, and oversew the sides to the two edges of the opening as far as the crease; then fold

the straight end of the gusset over at this crease, and hem all edges down, as in Fig. 4.

The gusset that is let into the junction of two seams to give more spring and strength is arranged in a different way. Such gussets as these are often inserted into bathing suits and children's rompers of the combination garment type, at the base of the centre front and back, where these meet the top of the short seams that run down the inside of the leg parts. A portion of the leg seams is left open here for this purpose, as Fig. 5 shows.

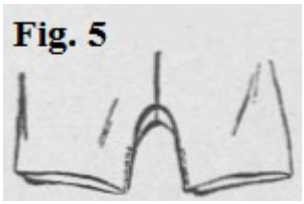


Fig. 5. Portion of leg seam left open for insertion of gusset.

To arrange this class of gusset, cut a piece of material about 3 in. square or more, according to taste; then fold it in halves, triangle fashion, and crease it along the fold. Open it out, place one point to the base of the centre-front of the garment, and run the two sides of one half to the front edges of the open leg seams, as far as the crease, which should reach the end of the leg seams.

Fold the other half of the gusset up, so that the remaining point reaches the base of the centre-back of garment, and run the two sides of this half to the back edges of the leg seam openings. Now take a square piece of material similar to the first, turn in all the edges, and hem them down over those of the first gusset, on the wrong side, to enclose them neatly.

GUT. Gut is a cord made from the fibres of the silkworm. One of its chief uses is in the manufacture of fishing tackle, generally in the form of casting lines and points, and also in short lengths attached to a hook. It is available in several thicknesses, fine, medium, and stout. Gut is very strong and of a bluish white colour, and stands prolonged immersion in water. The best method of attaching it to another line is by forming an eye at the end of the gut and whipping it with fine silk, and then varnishing it with shellac varnish. It is also useful in the stringing of beads.

GUTTA PERCHA. The solidified juice of various trees grown in Asia, this substance has many of the properties of rubber. The two are, however, slightly different in certain ways. For instance, gutta percha is less elastic than rubber, while it cannot be vulcanized. It becomes plastic at the temperature of boiling water. *See* Rubber.

GUTTERS AND GUTTERING

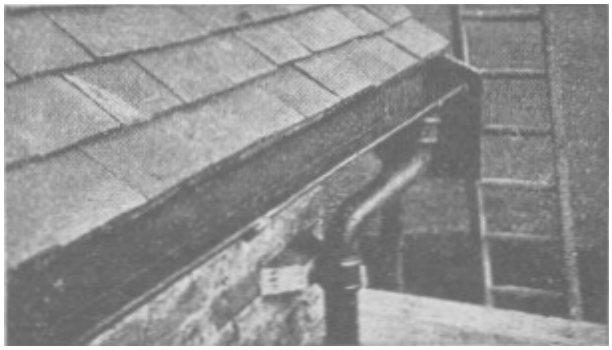
Matters of Economic Importance to Owner and Tenant.

This contribution belongs to a group dealing with the erection and maintenance of buildings. See therefore in addition to Bungalow; Cottage, House, such entries as Drains; Eaves; Flashing; Roof; Water Supply

The purpose of the gutter is to collect rainwater and conduct it to a drain or other outlet. In domestic architecture the word is applied generally to a cast-iron channel fitted round the eaves or edge of the roof and connected by down pipes to the drainage system. Land or surface gutters are found occasionally in domestic work, more especially in the country. With roof gutters the essential requirement is that the cross-sectional area should be large enough to deal with the water from the roof. A gutter about 4 in. wide is found satisfactory for small property, or where the roof area is small.

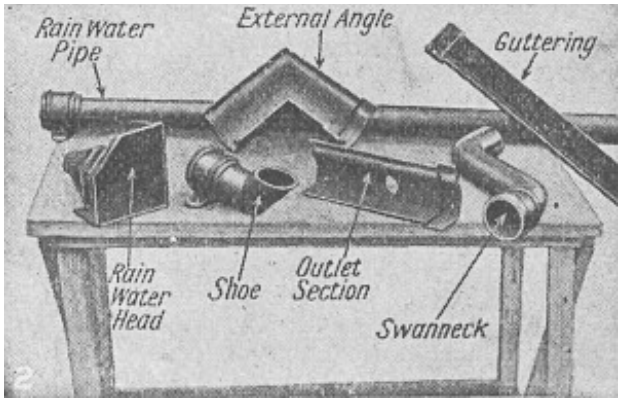
The gutter must be rigidly and firmly attached to the roof, and have a regular and steady fall to the down pipe. The ordinary span roof only requires eaves gutters, but where a part of the roof is joined to another roof at right angles to it the joint between the two roof coverings is known as a valley, and the gutter formed in it is termed a valley gutter. Such gutters are to be found round the roofs of many dormer windows, and should receive attention both during construction and, in the case of an older house, from the point of view of repairs. Many of the older houses, both in towns and in the country, are built with curb or M roofs, surrounded on all sides by a parapet.

Gutters formed of sheet-lead or zinc may have perished in the course of time and become porous. The most appropriate methods of repair will be apparent by studying their construction. Whatever may be the type, the water should flow down the gutter to one or more outlets, which should discharge into an open, cup-shaped fitting known as a hopper, or rain-water head. This forms a funnel to the down pipe, which conducts the water from the roof to the ground level, where it should discharge from a shoe into the trapped gully connected with the drainage (Fig. 1).



Gutter. Fig. 1. Down pipe swan-neck, and stop-end of an eaves gutter system.

Essential features of the down pipe and fittings include the following *(see* Fig. 2): The down pipe should be truly vertical, attached to the wall by screws or rose-headed nails, passed through the holes in the ears or lugs cast for that purpose on an iron pipe. Lead pipe is secured by straps similarly attached to the wall. The pipe should not be fixed close to the brickwork, but project 2 in. to enable the back of the pipe to be painted or attended to at any time, for which purpose packing pieces are placed between the wall and the lugs on the pipe.



Gutter. Fig. 2. Essential components of a gutter system.

The standard cast-iron rain-water pipes are made in various sizes, from 2 in. in diameter upwards. One end is enlarged to form a socket, and the other is plain. The usual length is 6 ft., although shorter or longer lengths are sometimes available. The pipe should be set with the socket upwards, the upper length having the rain-water head fitted into the socket on the pipe. The bottom length of the pipe fits into the socket on the shoe. The proper size of pipe to use will be determined, as already explained, by the area of the roof, but a 3 in. or 4 in. down pipe is generally fitted to an ordinary eight-roomed house, and is used in conjunction with a 4 in. gutter. The 2 in. pipes are only suitable for small buildings.

The fixing of eaves gutters should be carried out with care and thoroughness, for the reason that the gutters are naturally inaccessible, and once fitted ought not to call for further attention. Rigidity of attachment is essential to regularity of fall. The gutter itself is usually of cast-iron, half-round, O.G., or rectangular in cross section. The former is cheap, the latter more expensive and, incidentally, more handsome, especially if used in conjunction with square rain-water heads and pipes. The O.G. is used most commonly, as it can be screwed directly on to the fascia board, or to the feet of the rafters, whereas the half-round and other sections have to be supported by the gutter brackets. These methods of application are illustrated in Figs. 3 and 4.

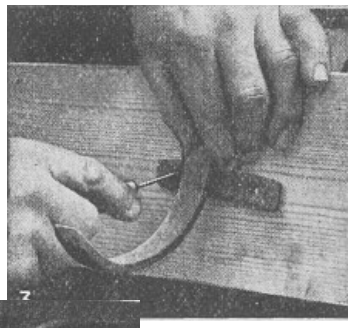


Fig. 3. Fixing a gutter bracket to the fascia board.

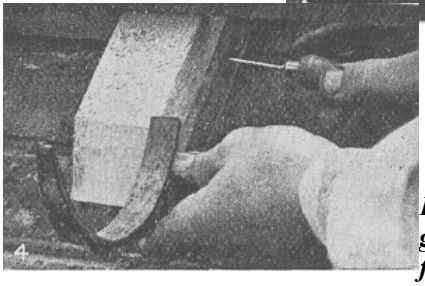


Fig. 4. Fixing gutter bracket to feet of rafters.

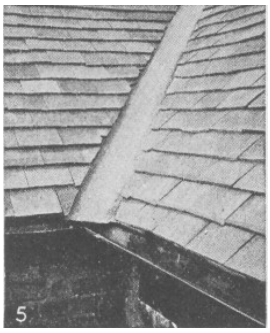
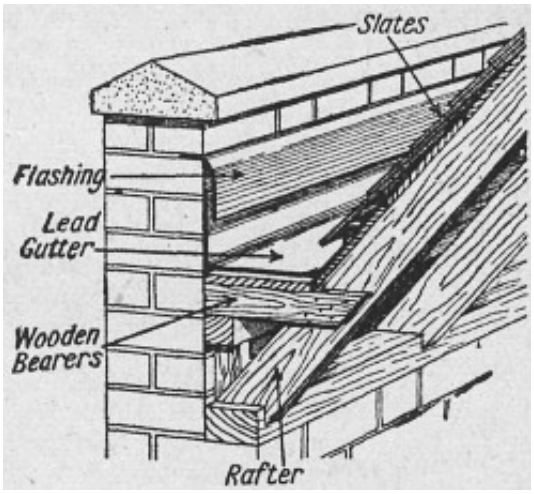


Fig. 5. Valley gutter, showing tiles cut back.

The construction of a valley gutter is shown in Fig. 5, also parts of the roof covering and the disposition of the eaves guttering. It should be made of stout sheet lead, as this has a very long life, and once properly fitted seldom causes trouble. A tiled roof may have the gutter formed by the use of the special valley tiles, which are worked in by the tilers as they cover in the roof. The parapet gutter should be laid with sheet lead or asphalt; the former is the usual material, and was used almost exclusively when this type of guttering was chiefly in vogue. The method of constructing such a gutter is shown in the diagram below (Fig. 6).



Gutter. Fig. 6. How the gutter is arranged in a parapet roof.

Wooden erections such as portable workshops or poultry houses, may have the kind of zinc and galvanized iron gutters sometimes known as shooting. They are supported by brackets or screwed to the feet of the rafters.

Repairing Gutters. A common cause of trouble is an obstruction in the gutter itself, such as a bird's nest or the accumulation of leaves. The outlet pipe of the rainwater head is choked up, and the remedy is to clear it out, either by means of an iron rod with a hook at the end, or by the removal of the obstruction from the top, and through the gutter itself. In so doing, where the gutter has a separate outlet pipe discharging into an open head, a piece of sack should be placed in the head to prevent dust and dirt falling into the down pipe, as this is very difficult to remove.

When the gutters have been cleared out, a jug of water should be poured on the roof at the highest point of the gutter. If the gutter is in correct line and has a proper and continuous fall, all the water will run away. If it is found that the gutter sags at one of the joints,

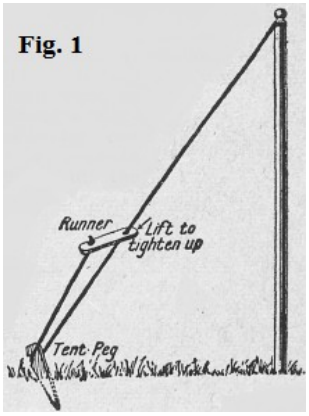
and a pocket of water remains, this indicates that the fastenings or the brackets are deficient in strength, and must be remedied. This is done preferably by fitting a new bracket, or, if that is not feasible, by inserting a packing piece between the bracket and gutter, thereby restoring the proper level.

In the case of the down pipe, it may be possible to clear it by using a heavy iron weight, sharpened at one end. Attach this to a cord, and pull it up and down in the pipe. If it fails, the pipe will have to be taken down, the choked section removed, and the obstruction got rid of by driving it through with a heavy bar, or by clearing it with a screw at the end of a drain-rod.

GUY ROPE. The use of a guy rope is to support some upright structure, which may be a tennis-net pole, a flagstaff, the mast of a wireless aerial, or a tent in the garden. As the safety of the structure largely depends upon the guy ropes, it is important to use a rope of the proper size, which may be of hemp or jute, or a steel wire or stranded steel cable.

Light mast. Height in feet	Tarred hemp rope. Circumfe-rence in inch	Equivalent size in plough steel wire. Circumference in inch.	Approximate breaking strain in tons
20	1½	½	¾
30	2¼	¾	1¼
40	3	⅞	2¼
50	3¾	1	4

The number of ropes varies; for example, a single rope of about 1 in. circumference at each corner post will suffice for a bathing tent, but a flagstaff requires more elaborate support. It may have one system of ropes from the ground almost to the top of the mast, another separate system from the ground to a point about ⅔ the height ot the mast, and a third system still nearer the ground. These are to give a distributed support for the mast, so that it will not bend in the middle. The accompanying table will serve as some indication of the use of guy ropes. In the examples given there are four ropes to each mast.

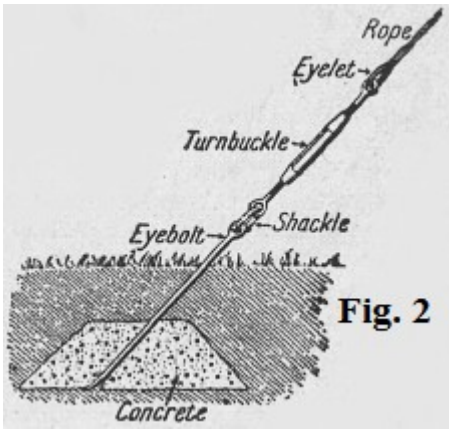


Guy Rope. Fig. 1. Tent peg and runner for setting up the rope.

Guy ropes are set up, or tensioned, in various ways. A simple method is by the use of a tent-peg driven into the ground, and a wooden runner (Fig. 1).

For permanent work, as in the erection of a flagstaff, the anchorage can be made to a concrete block embedded in the ground. An anchor bolt should be fixed in the block, and should point in the direction of the line of the rope. The rope can be attached to the anchorage by a turn buckle or wire strainer, one end shackled to the eye in the bolt and the other having a cringle or eyelet, the rope spliced round it, as in Fig. 2. The tension is obtained by tightening the turn buckle with a spanner, the rope having previously been stretched and tightened by a small purchase tackle between the rope and the eyebolt. *See* Aerial.

Fig. 2. Diagram showing anchorage and attachment of rope.



GYMNASIUM: In the Home. A simple gymnasium, with apparatus for all necessary exercises, can easily be fitted up in the house if a spare room is available. A suitable size is a room 20 or 24 ft. long and 14 ft. wide, but a smaller one can be utilized. There should be nothing in it to give rise to dust. A good light is desirable, and one at least of the end walls should be without a window so that the boys and girls can face this when jumping, and avoid accident due to a dazzling light.

The apparatus for such a gymnasium should include a portable and adjustable double beam to span the room; this should be counter-balanced in order that it can go to the ceiling and so be out of the way when it is not wanted. Two or four climbing ropes, a small vaulting horse and a pair of jumping stands are other necessary articles, as are three or four sections of wall bars and one or two mats. For men and boys a punch drum that can be fixed against the wall is useful, and the gymnasium should also contain a pulley-weight machine, boxing-gloves, Indian clubs, dumb bells and foils for fencing. As regards dress, the following is suggested as suitable for men and boys when practising in the gymnasium. A tight-fitting jersey or vest, with short arms, a pair of white flannel trousers, and a pair of canvas shoes with india-rubber soles and no heels comprise the necessary garments. A jersey of this kind will allow the arms to move freely, while for a like reason care should be taken that the trousers are not too tight at the seat. They can be fastened with a belt if the buckle and strap on them are not adequate. A sweater should also be provided, and should be put on as soon as the exercises are over, or during a pause.

Those responsible for the gymnasium should take special care that all the apparatus is properly fixed and fastened and therefore safe before being used. This is

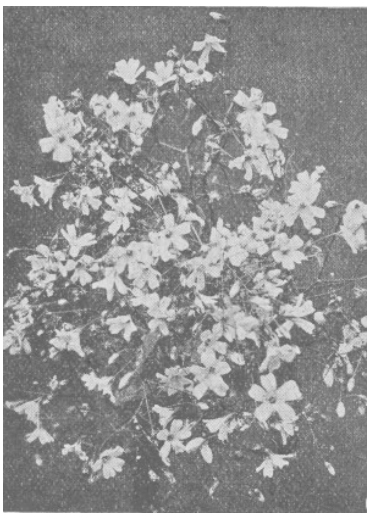
especially necessary in the case of horizontal bars and other articles that can be raised or lowered. *See* Dumb Bells; Exercise; Indian Club; Parallel Bars; Vaulting Horse, etc.

GYMNASTICS: For Health. Remedial exercises may be usefully employed in a large variety of ailments either for their beneficial action on the general nutrition of the body or for a disability affecting some particular organ or part. Some involve the use of apparatus, a high or low plinth bicycles, bars, etc., but a large number do not call for anything of the sort. These exercises, as a rule, should be supervised by a doctor. General exercises are useful in cases of poor development, convalescence from acute diseases, obesity, indigestion, etc, and should be done in the open air, when possible.

Breathing exercises are given for the cure of early and slight adenoids, for the development of the chest, to complete the cure after pleurisy and empyema by expanding the lung and stretching adhesions, and in various other conditions. *See* Beauty Culture; Breathing; Drill; Dumb Bells; Exercise.

GYMNOGRAMME. This is sometimes known as the golden fern, because of the golden powder on the undersides of the fronds of some sorts. A favourite is gymnogramme chrysophylla. They must be grown in a warm, moist greenhouse and need shade from sunshine. *See* Fern.

GYPSOPHILA or Gauze Flower. Of these hardy perennial and annual herbaceous plants the most popular species is paniculata, a beautiful spreading perennial growing about 4 ft. high. In summer it becomes a gauzy, lace-like mass of small white flowers which are in great demand for mixing with cut flowers. Although it thrives in most soils, G. paniculata prefers a light, dry, chalky soil and an open ordinary site. It can be raised from seed, but the seedlings grow slowly. Once planted it should remain undisturbed. The finest variety is one named Bristol Fairy. Gypsophila repens is a charming trailing perennial for the rock garden. Elegans is a dainty hardy annual which blooms in summer from seeds sown out of doors in April.



Gypsophila. Delicate blooms of Gypsophila elegans, a graceful annual very useful for cutting.

HABENARIA. A family of native hardy flowering orchids, the habenarias are found in meadows in Great Britain and Ireland. The best known, the butterfly orchid, has greenish-white flowers in June and is fragrant at night. There are other hardy species, which are suitable for the rockery, where they thrive in sandy peat. *See* Orchid.

HABERLEA RHODOPENSIS. An alpine plant from the Grecian mountains, this bears small, lilac-coloured, gloxinia-like flowers which spring from a rosette of leaves in June. It thrives best in a shady crevice in a compost of peat and sand. It may be raised from seeds in spring.

HABIT CLOTH. Plain, self-coloured woollens in medium or light weight, suitable for riding habits, coats and tailor-made costumes, sell under the name of habit cloth. Some have the surface of wool velours, some are face cloths of a more glossy finish, and others spongy. Made customarily from fine, short wools, they have a softness of touch, with sufficient firmness and suppleness to hang well. *See* Riding.

HACKING KNIFE. This tool is used to remove old putty from window frames and plaster from ceilings, for the scraping of paint, and similar work in connexion with the re-decoration of the home. It consists of a steel blade with a piece of leather or wood riveted on either side of it to form a handle. It is pointed at one end, thick at the back and tapering to a sharp edge.

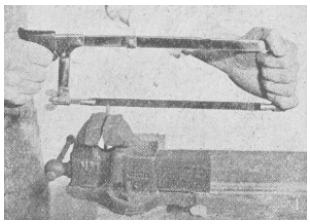
In removing putty, the point of the hacking knife is inserted into it, held in a horizontal position, and forced downward by tapping the back of the blade with a light hammer. When cleaning the plaster round a cornice or in any corners, the knife can be used as a scraper. If the end of the blade be broken, the knife can be restored to usefulness by regrinding it to a pointed shape. *See* Glass.

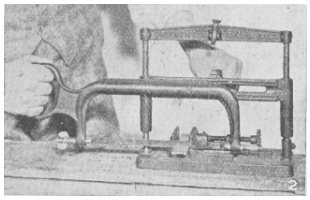
HACK SAW: How to Use. A hack saw is used for cutting metal, and consists of a blade carried in a frame. The blade is made of harder metal than the ordinary saw for cutting wood, and is either of dead hard or glass hard steel. The latter is extremely brittle. The frame of a hack saw is provided with pegs to engage the holes in the ends of the blade, and has a wing-nut so arranged that the blade can be strained quite tight by its use. Frames are made which are adjustable to take any standard length of saw-blade, but a fixed frame to take 12 in. blades will meet most ordinary requirements.

The blades vary in length, width, thickness, and fineness of teeth. The pitch of the teeth varies from 14 per in. to 24 per in. or finer. The coarser saws are used for most purposes, but the finer are essential for cutting tubing and thin sheet metal.

The blade is placed in the frame with the teeth facing outward, and inclined forward so as to cut on the push stroke. The holes in the ends of the blade being placed

over the pegs in the frame; the wing-nut is tightened so as to strain the saw quite hard. While tensioning the saw, care is needed to prevent the blade slipping off the pegs, and to see that the blade is not slightly twisted owing to the action of the tensioning screw.





Hack Saw. Fig. 1. Pistol grip hack saw frame in use. Fig. 2. Bench hack saw machine in use, the vice ensuring accurate cutting.

In use a hack-saw frame is held by its handle in the right hand and by the front bar in the left, and then pushed across the work with a light downward pressure. On the pull or recovery stroke the downward pressure is entirely removed. As the cut deepens, care is needed to ensure that the stroke is made along the direction of the cut, otherwise the saw will snap. Another cause of broken blades is allowing the frame to cant over to right or left during the stroke; the frame should be kept vertical. The full length of stroke should always be used, otherwise the teeth in the middle will get worn before the others.

A drop of oil on the teeth is sometimes a help when cutting mild steel, but the majority of mechanics use a saw dry on all materials. *See* Saw.

HADDOCK: How to Cook. Haddocks include the fresh, smoked and dried varieties, and also the specially cured finnan haddocks prepared near Aberdeen. Those caught in Dublin Bay and off the coast of Devonshire and Cornwall are said to be of the finest quality. Fresh haddocks, which may be served in various ways, should be cooked as soon as possible after purchase.

To boil them, place the fillets in a fish-kettle or frying-pan containing just enough salted boiling water to cover them, and simmer for about 10 min. or until the flesh is tender. A little vinegar may be added to the water. If steaming is preferred, cut the fillets into convenient-sized pieces, and place them on a greased plate on top of a saucepan of boiling water. Cover them with a piece of greased paper, and then with another plate, and steam them until the flesh is of a creamy appearance. This should take ¼ hour. The water in the pan must be kept boiling rapidly. Oyster sauce can accompany boiled or steamed haddock, and parsley may be used as a garnish.

To grill haddock, fillet the fish, cut each fillet into two pieces, wash them, coat them with melted butter and dip them into 1 oz. of flour seasoned to taste. Then place them on a greased gridiron and cook them for about 10 min. turning them once only.

Baked haddock makes another good dish. To prepare it, wash, clean and scale the fish, and fill the inside with veal stuffing, sewing up the opening with fine string. Then either truss it in the shape of the letter S or put its tail in its mouth, brush it all over with beaten egg and cover it with breadcrumbs. Put it in a baking-tin with a good lump of dripping. Bake it from 30 to 40 min., basting it occasionally with the dripping. Serve it with melted butter or anchovy sauce.

To fry a haddock, wash and dry the fish, and with a sharp knife cut the flesh down the centre of the back, carefully separating it from the bone. Cut the fillet across into convenient-sized pieces, brush each over with beaten egg and cover with crumbs. Fry them a golden brown in hot fat; drain them well, and serve them garnished with fried parsley. Alternatively the fish may be dipped in batter, fried, and then served with a good brown sauce.

Smoked haddock may be cooked and served in a casserole. Wash, dry, and trim the fish and cut it into quarters. Melt 1 oz. margarine in the casserole, add ¼ pint milk and the same quantity of water, and lay in the fish. Cover the pan and let its contents simmer for about 10 min. or till the fish is cooked through, when it should be taken out. Then mix ½ oz. flour with another gill of milk and pour it into the bottom of the casserole, stirring all the time. Let the whole boil up and thicken, add seasoning to taste, and then serve. The sauce should be of the same thickness as cream.

Haddock Ball. A dried haddock may be used to make balls or rissoles. Boil the fish in a fish-kettle or frying-pan until it is tender. Drain it, and separate flesh from bones. Well pound the flesh before adding 1 or 2 tablespoonfuls of grated Parmesan cheese, a little chopped parsley, and seasoning. Bind the whole with one or two well-beaten eggs and 2 teaspoonfuls of Worcester or other sauce. Form it into balls and fry these in smoking hot butter. They may be served on small rounds of fried bread.

Haddock Fritters. These are made by beating up the boned remains of a cooked dried haddock with an egg, coating neat pieces with batter and dropping the mixture in spoonfuls into very hot fat.

Haddock Scallop. Melt 1 oz. butter in a small pan over the fire and add to it 1½-2 gills milk and 3 well-beaten eggs. Stir these over the fire until they begin to thicken, taking care that they do not boil; then draw the pan away from the fire and add about 6 oz. cooked smoked haddock, broken into flakes, 2 teaspoonfuls anchovy essence, 2 oz. breadcrumbs, a dessertspoonful tomato sauce, the juice of half a lemon, and some seasoning. Heat up the whole thoroughly and turn it into scallop shells, the insides of which have been buttered and sprinkled with browned breadcrumbs. Cook the scallops in a quick oven until they are of a golden brown colour; then serve them immediately, garnished with small sprigs of parsley. This mixture can be spread on squares of buttered toast if preferred.

HAEMOPTYSIS. Coughing up or spitting of

blood which comes from the air passages or lungs is termed haemoptysis. It is one of the symptoms of consumption and may also occur in pneumonia, plastic bronchitis, and other diseases. When bleeding occurs the patient should lie down and keep quite still until seen by the doctor. *See* Bleeding; Consumption.

Haemorrhage. *See* Bleeding.

Haemorrhoids. *See* Piles.

HAEMOSTATIC. Certain substances used to stop bleeding are known as haemostatics or styptics. Cold, astringent salts of copper, tannic acid, ergot, and the perchloride of iron are all haemostatics, as they encourage clotting or cause the vessels to contract, and thus stop bleeding. *See* Bleeding.

HAGGIS: How to Prepare. This Scottish national dish is made chiefly from sheep's fry, chopped and mixed with other ingredients. To prepare it, procure the stomach of a sheep and wash the bags in several waters, rubbing them well with salt. Then scald them in boiling water, scrape them carefully with a knife, and soak them in a strong brine for 12 hours, trimming off any sinewy parts or pieces of gristle.

Wash the lights liver, and heart, and hang them up to dry for 12 hours; then put them in a saucepan with plenty of water and boil them gently. Take the small bag with the windpipe attached, wash it free from the brine put it into another saucepan, with the pipe hanging outside the pan and plenty ot water, and boil it slowly for about two hours.

Rub about a third of the liver through a wire sieve, and chop rather coarsely the small bag and 6 oz. mutton suet. Mix these with the liver, adding 1 heaped breakfastcupful of Scotch oatmeal, season the mixture with salt and pepper, and moisten with about 1 breakfastcupful of the liquor in which the lights etc., were boiled. Let the whole stand for ½ hour then stuff it into the large bag and sew it up securely, using strong thread. Put the haggis into a large saucepan of boiling water, and place a plate underneath to prevent it from sticking to the pan. Boil it quickly for 1½ hours, pricking the bag occasionally with a skewer to prevent it from bursting, and add more boiling water as the water in the pan diminishes. Serve the haggis on a hot dish as soon as it is taken out of the pan.

HAIR: ITS BEAUTY AND HYGIENE

How to Stimulate the Growth and Preserve the Natural Gloss

For other information about the hair see the articles on Baldness; Beauty Culture; Electrolysis. The reader may also consult the entries on various cosmetics and washes for the hair, e.g. Brilliantine; Henna; Shampoo.

To keep it in good condition proper care is required for the hair from earliest childhood. Five minutes' massage night and morning is excellent. It causes the blood to circulate more freely and brings the necessary nourishment to the hair follicles. It also loosens any dandruff, which is one of the worst enemies of the hair, and properly distributes the oily secretions. The last benefit is a particularly important matter in the case of fair hair, as any artificial oil at the roots has a darkening effect, and nature provides the necessary gloss. Massage with the cushions of the finger-tips, beginning by placing the fingers under the hair by the ears and with gentle pressure going over the whole scalp until it glows with the friction. Rub in such a manner that the scalp is moved and kneaded. This daily hair drill is more important even than brushing. Another method of stimulating the circulation is to take small strands of the hair and give them short, quick pulls, going over the whole head strand by strand. It is interesting to remember that whatever improves the circulation of the scalp will improve the complexion, as the muscles and tissues of the whole head are closely related.

The scalp should be kept scrupulously clean. This prevents blocking up of the hair follicles with dirt or dried sebum. Every hair has associated with it a sebaceous gland. These glands secrete a greasy substance known as sebum, which is nature's lubricant for the hair. If the follicles are blocked the escape of the sebum is prevented, and thus the hair is not only deprived of natural gloss, but the damming up of the secretion in the gland may cause pressure on the delicate hair root and permanently damage it.

The head should therefore be washed regularly, and the hair dried properly afterwards. An infant's scalp requires washing daily and drying with great care. A child should have its head washed once a week, a man usually requires a shampoo as often, and a woman about every ten days. Very dry and brittle hair should not be washed quite so frequently as normal or greasy hair.

Method of Shampooing. To shampoo the head the scalp and hair should be thoroughly wetted, and then a good lather rubbed briskly on to the scalp with the tips of the fingers. Cake soap should not be applied, as it is almost impossible to rinse it completely out. Pure castile soap may be shaved and dissolved by pouring hot water over it. This is a suitable shampoo for young children, and for fair or white hair. Tar soap lather is recommended for dark hair. A good herbal shampoo is satisfactory, and obviates the danger of leaving any soap in the hair after rinsing. The importance of complete rinsing cannot be too much stressed, and the final rinse should be with cold water. If the scalp is tender an egg shampoo is beneficial. A little borax may be dissolved in the rinsing water. For fair hair the juice of a lemon may be added to the water for the penultimate rinsing, and a little washing blue to the final one for white hair. When peroxide is employed to lighten the colour of hair, frequent rinsings in vinegar and water are advisable, as the vinegar counteracts the

weakening effect of the peroxide.

After thoroughly rinsing the hair should be dried with warmed towels. Artificial methods of drying hair, though difficult to avoid when time is a consideration, are not to be recommended, as they tend to make the hair brittle. A little brilliantine brushed through the hair after it is dry will improve its appearance and replace the natural oil temporarily removed by the shampoo.

The hair should be combed daily with a comb of good quality having rather thickly cut teeth. A comb should not be used to scrape the scalp, and no comb should be allowed to touch a baby's head, as it may damage the delicate skin.

Brushes and Brushing. The softest brush only should be used for a baby; stronger bristles will not injure the scalp once infancy is past, provided the brush is of good quality. Stiff-bristled brushes are good for strong crops of hair, but whalebone and wire brushes are seldom advisable. The hairbrush with bristles embedded in a rubber foundation is a comfortable and healthful type of brush to use for the average head of hair. Such a brush should be frequently cleaned with the smaller brush usually sold with it for this purpose. The latter can be dipped in warm soapsuds, shaken free of drips, and used to brush vigorously across the hairbrush. Rinse by applying the cleansing brush dipped in cold water, and dry as quickly as possible in the sun, or in a warm place, but not too near a fire. An ordinary wooden-backed brush can be washed by dabbing it up and down in hot water containing a little household ammonia. When clean rinse the brush in cold water, or the bristles will soften. As brushes are capable of conveying skin infection, they should be kept perfectly clean, and each child or person should have his own brush. It is unwise to use other people's brushes. A disinfectant, such as a few drops of Lysol, should be used in the rinsing water for the brush, should the scalp be troubled with dandruff.

The following method of stiffening the bristles is said to be successful. Dissolve 2 oz. alum in ½ pint of warm water, and then dip in the brush. Leave for a few moments and rinse in plain water. The operation of dipping in the alum may be repeated several times, should the bristles seem to require it.

For older children and adults, unless the hair is very brittle, a good brushing for five minutes at least once a day is beneficial. The scalp should feel slightly warm after this. The brush removes particles of scurf, stimulates the scalp, and so increases the blood supply to the hair roots and distributes the natural oil along the whole hair shaft. Brushing enhances the glossy appearance of the head.

Treatments for Bad Conditions. Should hair of any shade have been allowed to get out of condition through illness or too much exposure to sun and sea winds, and the scalp be troubled with scurf, a special treatment may be given. The head should be well massaged once a week at night with olive oil which has been heated in a small saucepan. A towel should be placed over the pillow to protect it from the greasy head and the hair shampooed in the morning. Tar soap lather is recommended, a double application being often necessary to get rid of the oil. Rinse afterwards in water to which a little borax has been added. This treatment can be assisted, until the hair is in good condition, by massaging into the roots twice a week an ointment composed of 4 oz. vaseline, 80 grains salicylic acid, and 60 grains boracic acid; alternating with this some lotion such as one made from 6 oz. bay rum, 3 drachms tincture cantharides, and 1 oz. spirit of rosemary, which should be used as a cleansing stimulant. An oil shampoo is not advisable for dyed hair, as it removes the colour.

The natural colour should return to faded hair after a two-months' course of such treatment, and it is unwise to brighten it artificially beyond the occasional use of a camomile shampoo for fair hair and ordinary henna shampoos for light brown or red hair. Brightening lotions which contain peroxide dry the natural oil out of the hair and thus contribute to premature greyness.

Any lotion or tonic treatment should be started just after the hair has been shampooed, and may be applied by means of a tiny sponge or cotton-wool swab on the end of an orange-stick, after the scalp has been thoroughly stimulated by massage. Tonics should be left off when the condition of the hair improves. Premature greyness of an hereditary nature seldom yields to treatment, but when due to dandruff, or some similar cause, may be corrected by the following pomade: Hydrochloride of pilocarpine, 2 grains; tincture of jaborandi, ½ oz.; lanolin, 1 ¼ oz.; coconut oil, 1 ¼ oz.

The value of most hair restorers depends to a great extent on the massage which is given prior to or during their application. The best contain ingredients which increase the flow of the blood to the scalp and thus stimulate growth. The commonest ingredients are some preparations of sulphur, ammonia, bay rum, pilocarpine, cantharides, capsicum, spirits of rosemary and quinine. A good tonic restorer is composed of liquor of ammonia (strong), ½ oz.; chloroform, ½ oz.; oil of sesame, ½ oz.; oil of lemon, ½ oz.; spirits of rosemary, 2 oz.

Restorers which contain sulphur are useful in cases of loss of hair due to dandruff. They act by destroying the cause and at the same time stimulating the skin. In general terms it may be said that the use of hair restorers is futile in cases of baldness where the hair papillae (the papilla is the active part of the hair) have been destroyed, whereas if the hair papillae still exist the stimulation of a good hair restorer may quicken the local circulation and the papillae may recover some of their old activity.

Despite every care a child's hair may become infested with parasites at school. To get rid of the nits the hair should be thoroughly moistened with equal parts of vinegar and water and carefully gone over

with a fine toothed comb. Care must be taken to see that all nits and scurf removed are burned in the paper in which they are collected.

The simplest preparation for killing lice is paraffin oil. This should be rubbed into the head at night, a rag soaked in the oil placed over the head and covered with a rubber cap. The treatment should be repeated the following morning and evening, and on the morning after the head should be thoroughly washed with soap and water. Paraffin is very inflammable and naked lights must not be brought near it. If there is any soreness of the scalp an equal mixture of olive oil and paraffin should be applied at night for the next ten days.

Alternative applications are the B.P. ointment of stavesacre, which is obtainable from any chemist, or the following: white precipitate ointment, 60 grains; zinc ointment to make 1 oz.

Brushes, combs and caps must be disinfected by being soaked in Lysol solution— 1 teaspoonful to a pint of warm water—and then rinsed thoroughly in soapy water.

Hair Dyes. Hair dyeing and tinting is best performed by experts, and henna dyes are usually the most satisfactory and also the safest to use. Some of the preparations sold for dyeing hair contain powerful irritants which may cause skin trouble involving not only the scalp but the face and neck. Unfortunately these dyes include some of the most satisfactory brown colourings. At a reliable hairdresser's an expert will experiment with a small portion of hair before applying such a dye over the whole scalp, in order to see if the customer is immune from possible bad results. Henna dyes for various shades of hair are sold with full instructions for use.

The henna paste is left on the hair for the time required for the particular tint, and then washed off with water. If using any form of hair dye at home it is advisable to wear rubber gloves and protect the skin of face and neck by smearing them with vaseline before applying the dye. The troubles with dyed hair are that it is difficult to keep the scalp in good condition owing to the effect of oil and tonics on the colour, that the white hair growing at the roots shows fairly soon and requires frequent touching up, that it presents a hard and lustreless appearance and that it can rarely be successfully permanently waved.

Hair can be bleached to blonde shades if this is carefully done. The bleaching should be effected gradually or the hair will suffer. Some women go over the scalp after a shampoo with peroxide (10 volume solution), applying it with a small toothbrush specially kept for the purpose.

Superfluous Hair. Peroxide is particularly useful for bleaching dark superfluous hairs on the face or arms, and rendering them less noticeable. It can be used in a treatment with resorcin soap, a cake of which is dipped in hot water and rubbed on the skin. Water will remove the stain of this soap, but it should be left on at night. After washing the face in the morning apply peroxide of hydrogen and ammonia in the proportion of 10 drops of peroxide to 1 of ammonia. The solution must be freshly mixed each time and applied with a pad of cotton wool. It may smart a little at first, but the skin will grow used to the treatment, which should be persevered with. After some time the skin may be able to stand a stronger solution in the proportion of 5 drops of peroxide to 3 of ammonia. Apply cold cream afterwards if the face feels sore. This treatment should eventually not only bleach but kill the hair roots. For strong, persistent growths of superfluous hair on the face either electrolysis or diathermy is often employed. It is essential to have such treatments performed by a good operator (See p. 709).

Waving the Hair. Home waving with curling irons is always a difficult matter and apt to be unbecoming. The simplest method is to part the hair and wind it round rather thick irons. This gives big natural looking waves, but is only suitable for longer hair. Hair with the slightest disposition to a natural wave should be encouraged by being set in combs after a shampoo. Straight hair when beautifully kept to give it a smooth sheen is becoming to women with well-shaped heads.

Permanent waving solves many hairdressing problems. At the same time it is not a means of lessening proper care of the hair. The scalp should be in good condition before the hair is permanently waved, and the process should be considered as a decorative step towards a charmingly finished head rather than as an end in itself. Cheap permanent waving should not be risked. The best operators—and the operator is of more importance in this connexion than the system employed—are to be found at the best hair-dressing establishments, or in such departments at well-known stores.

Where disappointment follows after permanent waving it is usually due to lack of experience on the part of the operator or to lack of subsequent care of the hair. If the scalp is dry the permanent wave will make it dryer. The hygiene of the hair, as described in the first part of this article, must be daily practised and foolish prejudices about disarranging the set of the waves by massage and brushing must be discarded if the result is to be worth the expense not only of the initial operation, but also of the settings, necessary at least once a fortnight, to keep the waves from developing into a mere frizz.

This setting can be done at home with a setting lotion and by careful adjustment of special combs or metal clips used after a shampoo. A net should be worn over the head while the hair is setting. Some women wear a shingle net over combs at night to keep their permanent waves set, but the practice is not really good for the hair, which benefits by being left quite loose.

In dressing long hair the smallest number of hairpins, compatible with making the knot securely close to the head, should be used. Slides for children's hair should be of non-inflammable material.

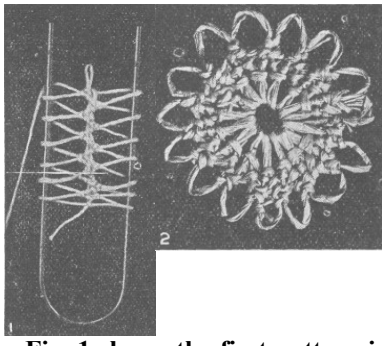
HAIRCLOTH. Mohair, alpaca, camel-hair and other cloths made from hair as fine as or finer than wool are only technically haircloths. What are usually known by this name are such coarse fabrics as horsehair or crinoline cloths, used by tailors to stiffen the shoulders of jackets, or the hair interlining for making soft lapels. Haircloth is employed for interlinings because of its resiliency; when bent, it tends naturally to return to its position, thus keeping the garment in shape.

Crinoline cloth lent its name to the style of dress in which the skirt was distended by the stiffness of the horsehair. Tail hairs of horses woven one at a time across a set of cotton or linen threads make both crinoline cloth and the horsehair seating to be seen on furniture. As chair-seating material, haircloth is immensely durable. Crinoline made from real horsehair for hat shapes has been largely replaced by a form of artificial silk.

To make flexible canvas hair interlinings, Chinese human hair, as well as goat and other strong hair, is used; the fabric resembles a brown flax canvas, but is more springy. The hair carpet sold for stairs and passages is made in the Brussels style from cowhair. Cowhair often forms the pile of cheap plushettes for portières, mantelpiece drapery, and the covering of toy animals, such as Teddy bears.

Haircloths are made for strainers for kitchen use, and for belts for driving machinery. In buying haircloth for interlining coats the resiliency may be tested by folding and creasing the sample, and noting how it recovers its flatness.

HAIRPIN WORK. This work is so named because of the fact that it is done on a two-pronged fork which resembles a large steel hairpin. It is made in several sizes, and there is also an adjustable fork, the width between the prongs being regulated by a screw. On this implement insertions from 1 in. to about 4 in. wide can be worked in thick silk, cotton, or raffia.



Hairpin Work. Fig. 1. Showing how the first pattern is worked on the prong. Fig. 2. Medallion of coloured raffia, a suitable trimming for a summer hat.

Fig. 1 shows the first pattern in hairpin work, and it is on a prong measuring 1¼ in. wide. A steel crochet hook is also required of a size according to the thickness of the working thread. Make a loose crochet chain on the hook and draw it out until it is about as long as half the width between the prongs of the pin. Draw out the crochet hook, slip this loop on the left-hand prong, and see that the length of working thread is in front of the fork. Hold the pin with the thumb and middle finger of the left hand and the rounded part in the palm. Pass the thread round the right prong from the front, and put the hook upward, from the front, through the loop on the left prong. Catch the thread and draw it through the loop, thread over the hook and draw it through the loop which is on the hook, making a double crochet.

Pass the thread from behind round the left prong, and turn the latter to the right, so that the thread now surrounds the right prong. As the pin is turned, let the crochet hook pass between the prongs so that it will be in position to work from the front again. * Draw the thread through the loop on the hook, then put the hook upwards from below through the loop on the left prong, draw the thread through and work a double crochet as before. Repeat from * until the pin is full, then take the loops off the prongs, and if more are wanted replace two or three of the loops at the top and continue working as before.

When the work is taken off the prongs the little loops twist into a figure 8. To make an insertion, join the silk to the first loop by working a double crochet into it, inserting the hook from right to left all through to preserve the twist or figure 8. After the double crochet make one chain stitch, and continue all along, alternately working one chain and one double crochet in the loop. Work the opposite loops in the same way to complete the insertion. A lace can be made by working a shell edging along one side.

Fig. 2 shows the hat trimming worked with raffia, and a No. 00 steel crochet hook, on the small prong 1¼ in. wide. Raffia can be bought in many colours, as well as natural colour. Before working the raffia it is best to soak it in cold water for about 10 min. to make it more pliable, after which wipe the water off. Proceed as in Fig. 1 until there are 18 loops on each prong, slip off the pin and cut the raffia, then tie this cut end to the end at the beginning of the work to form a ring. Run a piece of raffia through one round of loops and draw up so that it forms a flat piece; tie and secure the raffia. A piece of silk could be used for the latter purpose, as it is inside the loops and the ends need not show. When a sufficient number of these rings have been made in various colours they can be arranged round the crown of a shady garden hat made of coarse straw. *See* Crochet, Raffia.

HAIRSPRING. This name is given to a small spring used in conjunction with the balance-wheel staff of a timepiece. Its function is to control the regular motion of the balance wheel. It is a very delicate spring and should never be interfered with. *See* Clock; Watch.

HAKE: How to Cook. Many consider hake to be superior to haddock and plaice, both in flavour, digestibility, and nutritive qualities. To bake it, cut four slices from a medium-sized hake, wash and dry them, and lay them in a greased fireproof baking-dish. Dredge them with flour and sprinkle over them a good seasoning of salt and pepper, a teaspoonful each of finely chopped parsley and onion, and 1 oz. butter cut into small pieces. Bake the fish gently for ½ an hour,

basting it occasionally; then place it on a hot dish, strain the liquor over it, and it is ready for the table.

Hake au gratin is prepared in the same way except that the parsley and onion are omitted and a tablespoonful each of browned crumbs and grated cheese used instead. Hake may also be cooked according to any of the recipes given for cod. *See* Cod; Fish.

HALATION: Of Negatives. Halation is a fogging of negatives caused by scattering or reflection of light in the film. Thus if a window through which sunlight or a strong light passes is included in a photograph, not only will the window part of the picture be considerably over-exposed, but all round it a fog of light, without any detail whatever, will appear in the print.

Similarly, halation will appear when trees against a bright sky are photographed. The trouble is largely overcome by coating the back of a glass plate with a preparation which absorbs the light passing through the film and prevents its reflection on the underside of the film. This is known as backing the plate. It has been found that unbacked plates coated with a matt emulsion hardly suffer from halation at all.

Films do not suffer from halation to the same extent as plates, but care should be taken not to over-expose if strong high-lights are in the picture. Where moderate halation occurs with over-exposed high-lights, the defect can be overcome to a certain extent by local reduction of the negative. The fogged over-exposed portion is treated with a weak reducing solution applied with a piece of cotton wool on a match-stick. *See* Reducer.

HALF TIMBER. This term is used to describe those buildings, chiefly houses, in which the framework is of timber, the intermediate panels being filled with brick, plaster stucco, or other material of that kind. In some of these houses the masonry or brickwork rises through two storeys, and the half-timber work is confined to the gables, Many old examples were covered with plaster or stucco, but in some cases this has been subsequently removed.

This style, which prevailed in England in the 16th century, when native timber was plentiful, has been much imitated in the 20th century. Modern half-timber houses, however, differ essentially from the old ones, for in them the timbers are merely on the surface, being only thin pieces of wood nailed to a brick backing and lacking the solid look that real half-timber work can produce. *See* Architecture; Cottage.

HALIBUT. Baked halibut is prepared in the same way as hake (q.v.), except that it is covered with thin slices of bacon or ham.

To stew halibut, wash and dry 3 to 4 lb. of the fish, put it into a stewpan, and barely cover it with milk. Add an onion with 3 or 4 cloves stuck in it, a bay leaf, and a little salt and pepper, and bring all gently to boiling point. Mix together 1 oz. flour and 1 oz. butter; add this to the halibut and simmer the whole gently until the bones can easily be separated from the flesh.

Serve it on a hot dish and pour over it some of the liquor, to which has been added a teaspoonful of lemon juice and seasoning. The remainder should be sent to table in a sauce boat. This provides a specially good way of cooking the head and shoulders of halibut.

HALLS: DECORATION AND FURNISHING
Suggestions for Treatment in Various Styles

This article concludes with a section on the construction of a hall stand. See also the entries on Carpet; Chair; Chest; Chimney Piece; Cupboard; Door; Electric Light Fittings; Flowers; Frieze; Furniture; Grandfather Clock; Landing; Panelling; Settle; Staircase; Table

It sometimes seems as though the hall had been neglected in a scheme of house decoration; yet, apart from the fact that every corner of the home should be well and suitably planned, the hall is also important because visitors take their first impressions of the house from the entrance. Therefore it is necessary to give the hall as hospitable and friendly an air as possible.

This is especially difficult with the small narrow hall, which is still too often merely completed with an umbrella and coat stand, a hard wooden chair and a hall table of un-pleasing shape. For the larger type of hall it is easier to evolve a good decorative scheme, whether on classical lines or with comfortable lounge furniture; but here, too, details of colour, flooring and lighting fittings are sometimes not carried out to a harmonious conclusion.

In furnishing much depends on whether the staircase opens directly out of the hall or from an inner hall, which may or may not be entirely cut off. A beautiful staircase opening out of the hall directly makes all the difference; it is an architectural feature which can only be modified or disguised at considerable cost if it is not well designed and executed when building the house.

In some modern houses there is a square entrance hall, of which the fourth wall is left incomplete, leaving an open archway to the back hall from which the staircase ascends. If the hall is to be used as a lounge and living room, it is convenient to have an inner glazed door, so that there is light and a view on to the garden, as the main door can then be left open. This is desirable, because it is rarely possible to secure more than one window in the hall. The glass panels and wrought ironwork of this type of door look particularly well in a dignified hall with black and white tiling and one or two pieces of beautiful furniture.

In some houses the hall is converted into a lounge by removing the partition which separates it from the front room. Here also an inner door is advisable, more for the purpose of keeping out draughts than for giving extra light. In the absence of such a door, draughts may be avoided to some extent by the use of a leather screen.

Suitable Furnishing. If there is a fine pavement, such as a black and white square, this is always effective. A composition paving which simulates stone, an oak plank or a good parquet flooring, an inlaid linoleum to resemble the last, or rubber-tiled and marble floorings are all suitable. Persian, other Oriental, or modern rugs which introduce brilliant colouring in geometrical designs, give an air of comfort. For the long narrow corridor often met with in a flat, a strip of wide stair carpet in a good design is usually a better choice than intermittent rugs when the boards have to be stained. Plain carpet looks attractive but shows every footmark. Hall door mats should fit neatly.

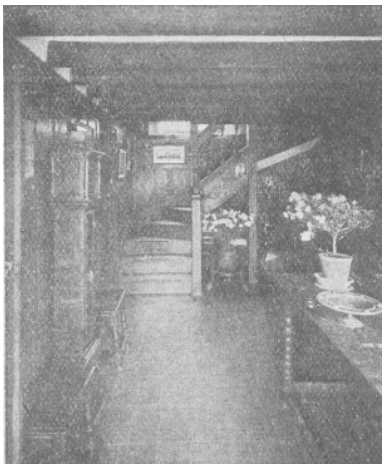
Where there is either an outer hall or a back hall the question of the position of the hall stand is solved. These pieces of furniture are not decorative, and coats, especially when they are wet, are not benefited by being hung up on them. The cupboard, either built-in or movable, is a welcome alternative and serves also for an umbrella stand, when fitted with a rack for this purpose fixed to the inside of the door. In the small flat wet coats and umbrellas are often accommodated, while drying, in the bathroom, a row of pegs being provided on the door for the former and the latter being left open till dry. In larger old houses and in most modern ones there is usually a cloak room off the hall where coats and mackintoshes can be properly hung up.

In old country houses the open fireplace is usually an important feature of the hall. In the modern house, if there is no central heating, the most practical fireplace is the anthracite stove. Radiators can be cleverly hidden behind wrought iron or wooden grilles under the window or at a turn of the stairs.

A favourite style of furniture for the lounge type of hall is the Jacobean, or, if it can be obtained, Normandy oak. Old oak chests for keeping requisites for outdoor games, a big oak cupboard for hanging mackintoshes and coats, a gate-leg table for tea, an oak bureau, high-backed chairs, some easy chairs and a settee covered in velvet or in a printed linen of Jacobean design, a table for visiting cards, in post and out post, and in the country, should there be no electric lighting, another table by the staircase for bedroom candles and lamps—these are the usual pieces of furniture required for such a hall. As there are often many exits and entrances, a tall draught screen placed where wanted is a useful addition.

For floral decoration much depends on the type of hall and the taste of the owner. Formal orange trees in big tubs are picturesque in a hall with paved floor. In a country house such plants as hydrangeas, azaleas or geraniums in tubs or large pots, palms or small flowering trees or Japanese trees can also be used with good effect. In many country houses a feature is made of this floral decoration of the hall, and it is transformed into a winter garden during the gloomy months. In the summer an arrangement of flowers on the hearth gives a very inviting air.

The colour scheme must be carefully thought out, as the decoration of the hall is the keynote to the whole house. Where this is treated on modern lines, the furniture and decoration of the hall will, of course, fall in with it. Where there are panelled walls and an old wooden staircase the choice of furniture and flooring for the hall will not quarrel with the period. The latter type of hall needs few wall ornaments. Pictures should be scarce and oil paintings look best when let into a panel over the fireplace. Panels of tapestry also give good notes of colour.



The question of lighting is important. The choice of hall fittings is varied and many firms specialize in good designs suitable for various styles and periods.

Hall. Fig. 1. Panelled and tiled hall, with Jacobean oak furnishing and heavy beams.

Our Illustrations. A particularly charming old wrought iron lamp head fitted for electric light completes the newel at the base of the polished and uncarpeted stairs in the first illustration. This hall is furnished in a delightful style. Its dark panelling, leaded casement and heavy beams demand plain furniture. The Jacobean table and stools accord perfectly with them, while the early 18th century grandfather clock is equally happy and the red tiled floor adds a rich note of colour. This is further enhanced by the azaleas and a few pieces of old brass.

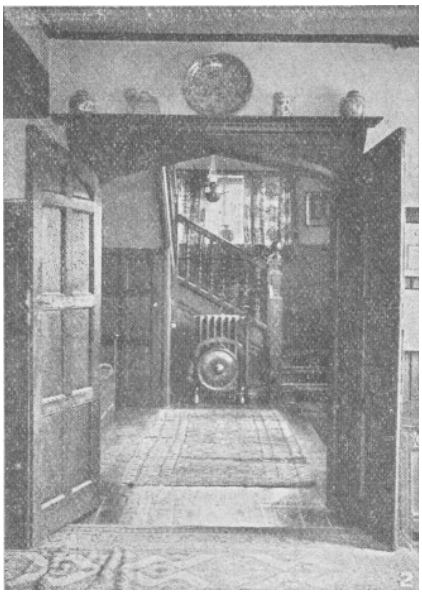


Fig. 2. Small oak furnished hall with panelled and carved oak staircase and doors. (Humphrey Joel)

Another inviting but smaller panelled hall is shown in Fig. 2. Here the interest is centred on the carved oak of the double doors into the sitting room and of the staircase. A Persian rug on the oak boarded floor makes a connecting colour link between the Oriental design of the silk casement curtain and the pottery on the shelf formed by the

architrave of the door. An old settle is visible on the left and there is an attractive gong. This hall is warmed by a radiator and lit by a hanging oil lamp.

Although imitations are seldom deceptive, quite a good effect can be obtained by using lincrusta moulded wall covering, which simulates oak panelling. Made in rolls and fixed like wallpaper, some of the designs are exact copies of old English panelling. In flats or houses rented for periods of a few years, most people would hesitate to pay the large sum necessary to panel a hall and staircase in real oak. These lincrusta wall coverings are useful in such cases especially when sur-mounted by an anaglypta frieze with plaster-like relief, as shown in Fig. 3. The dark oak coloured cornice is a change. Both frieze and ceiling are distempered an old ivory shade The carved pedestal with its Chinese jar, the oak chair and the Oriental carpet are all well chosen to furnish this small but rather highly decorated town hall, which requires no heavy pieces.

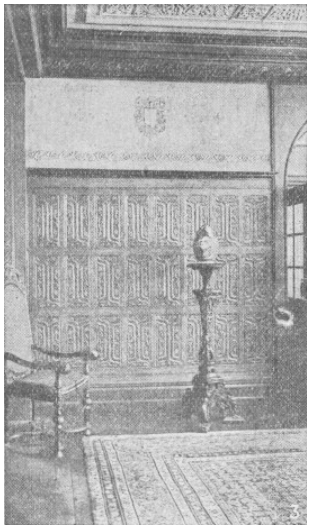


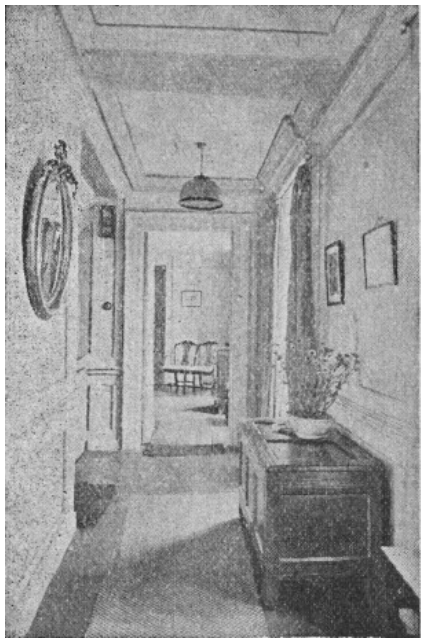
Fig. 3. Lincrusta panelling to imitate carved oak surmounted by a frieze, suitable for a modern flat. (Courtesy of Arthur Sanderson & Sons, Ltd.)

A very different type of entrance is shown in Fig. 4. Here the black and white marbled tiling and pillared archways call for dignified and restrained furnishing. The white painted staircase with its mahogany handrail has a suggestion of Georgian style. Colour accents are supplied by the pieces of old china and the flowers on the table.



Fig. 4. Large hall, simply furnished, with low pillared archways and windows set near the ceiling.

A difficult hall to decorate successfully is the long narrow corridor type found in many flats. Fig. 5 shows a hall of this kind panelled in simple Georgian style in accord with the furnishing of the sitting rooms opening off it. The polished chest just breaks the straight look of the passage, the round mirror also helping to do this on the other side. Wherever an appearance of space is needed light self-coloured walls should be chosen. A modern treatment for such a hall might be pale grey papered walls and a silver ceiling. Colour would be introduced by the curtains and carpet. For either flat or small town house the treatment shown in Fig. 6 is suitable. The landscape wallpaper motif is bought separately and applied with the framing of raised moulding. In a tiny hall, one such motif is sufficient, but in the case of a house the landscape might be repeated on suitable spaces on the landing walls. The paper used with the motifs has a marble tiled effect in grey-green colouring which is in pleasing harmony with the sky, foliage and water of the landscape.



Hall. Fig. 5. A narrow hall treated in such a way as to give an effect of spaciousness.

Hall Stand in Oak. The hall stand shown in Figs. 7 and 8 is made from a set of prepared materials put up by a well-known firm of dealers in handicrafts requisites. Joints are already cut, and the difficult portion of the work has been done.

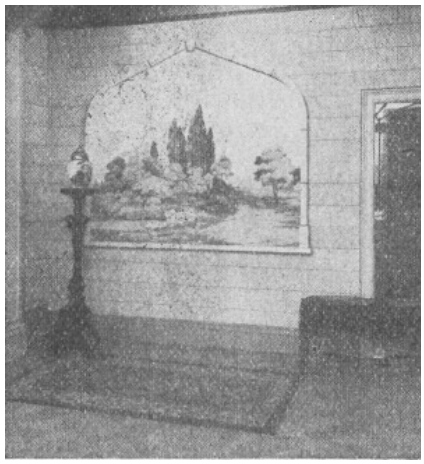
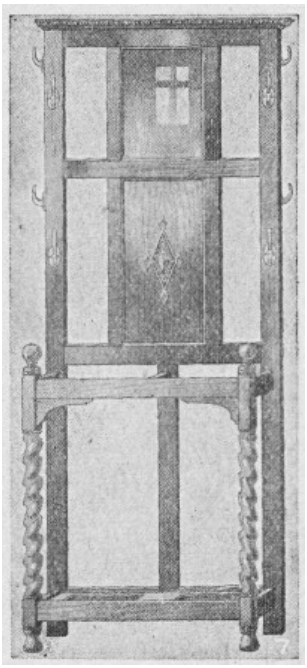


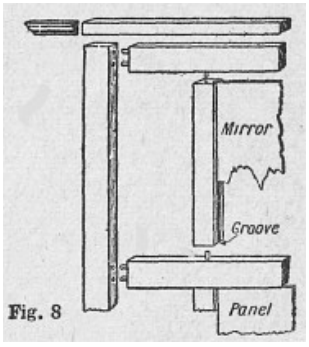
Fig. 6. Wallpaper treatment with applied landscape motif on a varnished and marbled paper. (Arthur Sanderson & Sons. Ltd.)

The diagram shows the method of assembling the component parts. The back is taken in hand first, the joints being glued up and the whole cramped and put aside for the glue to set. It will be seen that dowels are largely used, this method presenting little difficulty to the worker. The mirror and plywood panel fit into the grooves in the uprights (Figs. 8 and 9), a bead being mitred round the front to finish. The mirror is secured at the back as shown (Fig. 9), and is covered in by a plywood backboard.

The front of the stand is glued up, less the shaped brackets, and put aside to set hard. It is connected to the back by glueing up and fixing the top and bottom rails. The board which receives the two drip pans is supported by slips glued to the side rails. The shaped brackets are added afterwards. The methods of fixing the capping and securing the plywood panel are shown in Fig. 9.

Hall. Fig. 7. Hall stand, the making of which is described in the text.





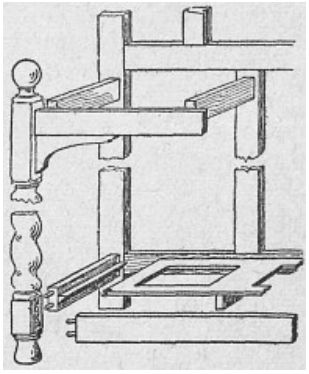


Fig. 8. Details for the construction of this useful piece of furniture.

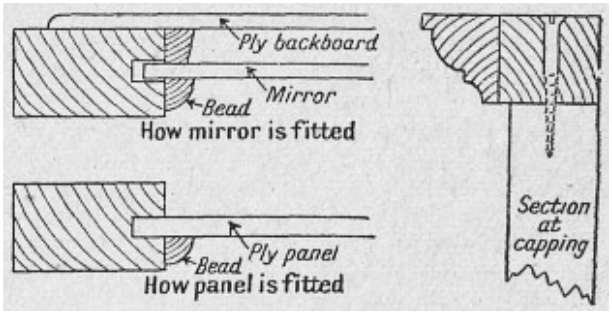


Fig. 9. Diagram showing method of fixing mirror, panel, and capping of the hall stand illustrated above.

Hall Mark. *See* **Silver.**

HALLOWE'EN. Hallowe'en, or All Hallowe'en, is kept on Oct. 31, the eve of All Saints' Day, and from the customs of pagan times some games have come down to us.

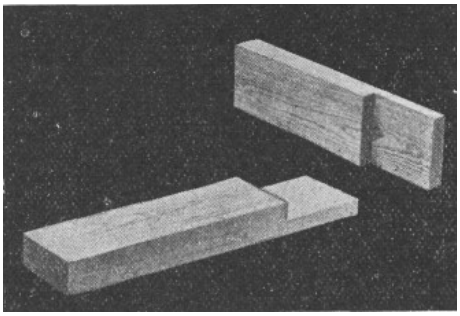
Chestnuts are used for purposes of divination. They are roasted on the bars of the grate by different people in turn. If a girl is in charge she names three chestnuts after men of her acquaintance, and the one that pops first bears the name of the man she will marry. The men name their chestnuts after girls with the same purpose. If two nuts are put on the bars side by side, one named after the girl and the other after the man, and they both burn together, the two will be married.

Another familiar game is bob apple. A tub is filled with water and a number of apples floated in it. The players have to catch the apples with their teeth as best they can, which usually means ducking their heads well into the water. In another form of the game, apples are suspended by a string from the ceiling, or some high bar near the ceiling, and each player in turn stands in front of an apple and, with hands clasped behind the back, endeavours to catch it with his or her teeth.

HALMA. This game is played on a square board divided into 256 squares, 16 each way. Wooden pieces are employed, something like the pawns in chess, but smaller. It is usually played by two players, who have each 19 pieces, one group being black and the other white. The pieces are grouped when play opens in opposite corners of the board, enclosures being marked off for them on the board.

The object of the game is to get one's 19 pieces into the opponent's enclosure before he can do the same. The players move alternately, one piece at a time, into an adjoining square, except when a piece can be moved over another piece into a vacant square beyond. In one move a piece can be passed over as many pieces as possible, and the pieces can be moved over friendly as well as hostile ones. If four persons play, each has 13 pieces, coloured white, black, red, and green, and they can play either each for his own hand or two against two.

HALVED JOINT. The general appearance of a lapped halved joint is illustrated on the next page. As an example, suppose it is desired to make a joint at the corner of a simple frame work, and that the material is 3 in. wide and 2 in. thick. First plane up the material on all sides, and square off the ends. Then at a distance of 3 in. from the end square a line around three sides of the material, set the marking gauge exactly at half the thickness of the wood, and mark a line on the edges of the pieces of wood, on both sides, and the end where the joint is to be made.



Halved Joint. Method of joining two pieces of wood, securing the carefully fitted parts with glue or screws.

Place the wood horizontally in a vice, or rest it against the bench hook, and saw across the wood exactly on the line marked across it, and to a depth of half the thickness of the material. Put the material in

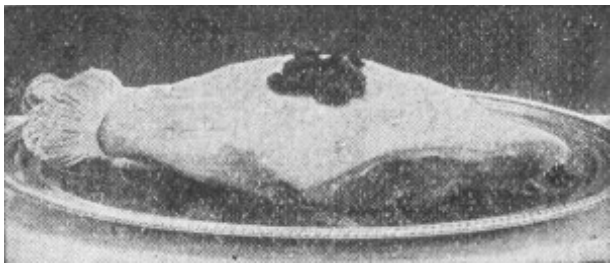
an upright position in the vice, and then saw along the line cut by the marking gauge, sawing to the edge of the line. This will remove a square piece of wood, 1 in. thick, from the main portion, and if both are carefully sawn, the result should be a neat and accurate joint when the two pieces are put together.

The joint surfaces should be trued up with a sharp chisel, and the two pieces accurately fitted. The joint is completed by glueing, screwing, or nailing the parts together. The same principle can be adopted for oblique-angled joints, or for running joints, as when joining the ends of two pieces together in a straight line.

HAM: Curing and Cooking. When selecting a leg of ham choose one that has a short shank and a moderate amount of fat, and test its freshness by inserting the knife under the bone. The ham is good if the knife comes out clean and smells fresh, and bad if daubed and of a rank, disagreeable odour.

Hams may be cured at home by rubbing them well with common salt, leaving them to stand for three days, and then draining off the brine. Mix 1 lb of brown sugar, the same quantity of common salt, and 2 oz. of saltpetre, rub the hams well with this mixture, and put them in a vessel large enough to hold them. Leave them for another three days; then pour a quart of vinegar over them. Turn them over in the brine once every day for a month, then drain them well and hang them up to dry. When sufficiently dry put them in muslin bags to protect them from flies and dust. After draining them from the brine, an alternative method is to smoke them over a wood fire, hanging them directly above it.

To boil a ham, first soak it for about 12 hours, or longer if it seems very dry, wash it thoroughly and trim away all rusty parts. Put it in a pan with enough cold water to cover it, and bring it gradually to the boil, removing all scum as it rises. Then let it simmer gently until tender. A ham weighing about 10 lb. will require 4 hours' gentle cooking. When done, take it out of the pot, strip off the skin, and sprinkle over it some browned crumbs or raspings. If the ham is to be served cold let it remain in the water until quite cold, as this renders it more mellow.



Ham. Boiled ham sprinkled with breadcrumbs and garnished with parsley and a paper frill round the bone.

A ham may also be baked. To do this, first soak it in cold water for 12 hours, then wipe it dry and trim off all rusty parts. Make a crust of flour and water, thick enough to keep in all the juices, cover the ham entirely with this, put it into a baking tin in a moderately hot oven, and bake it for about 4 hours. Then remove the crust, and skin. Cover the top with raspings, and pin a paper frill round the knuckle.

A favourite breakfast dish, fried ham and eggs, is prepared by cutting the required number of slices and frying them. Cook the ham on both sides and then keep it warm while the eggs are being prepared. Break these, one at a time, into a cup and then cook them in the fat which remains in the pan, adding a little more if necessary. Baste the eggs with the hot fat to set the tops. When set take up with an egg slice and lay them on the ham. Ham prepared in this way may also be served with baked or grilled tomatoes. Grilled ham may be cooked in a Dutch oven before the fire or beneath a gas griller.

Potted ham is made by mincing together ½ lb cold lean ham and 3 oz. cold roast veal, and then pounding them in a mortar with ¼ lb. butter, added by degrees. When all are well beaten, sprinkle over them a mixture comprising ½ teaspoonful freshly pounded mace, a little less than quarter of a grated nutmeg and a good pinch of cayenne. Mix all together, and then press the meat into pots, pouring clarified butter over the top. If kept in a cool, dry place this meat will remain good for over a fortnight.

To glaze a ham, take off the rind, trim it and, after placing it in the oven for a few minutes, dry it with a cloth. Dip a paste brush into some melted glaze and brush it over the ham, giving two or three coats.

Ham Pie. To make this pie, boil 3 oz. of macaroni, allow it to get cold, and cut it into inch lengths. Mince ½ lb. ham, and put a layer of this at the bottom of a pie-dish. Season with pepper and sprinkle over it some minced parsley; then add a layer of macaroni, some chopped onion, and some small pieces of butter. Continue these layers until the dish is almost filled, and then add a little white sauce, a layer of fine breadcrumbs, and some more pieces of butter. Bake the pie in a moderate oven until it is lightly browned.

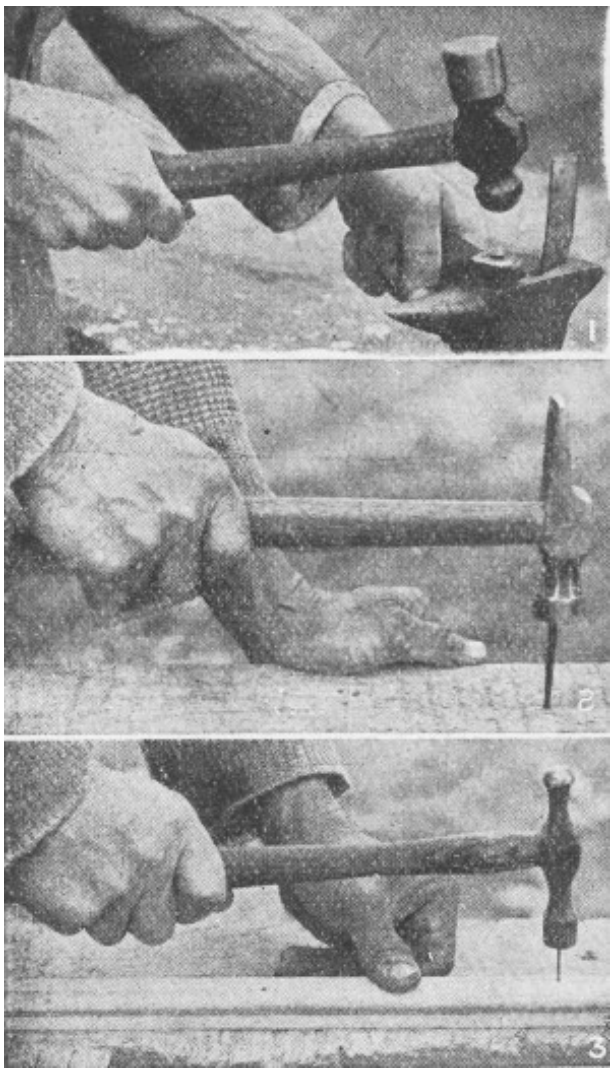
Ham Soufflé. A large cold ham soufflé or several small ones can be made as follows: Chop ½ lb. lean cooked ham, and pound it in a mortar with ½ pint brown sauce, afterwards rubbing them through a sieve. Whisk 1½ gills of melted aspic jelly until it begins to set; then stir it into the ham mixture, seasoning it with salt, pepper, ground nutmeg and mace. Whip ¼ pint cream until it will just hang on the whisk; then stir it in, whisking it for about 5 min.

Have ready some small soufflé cases, tie a band of foolscap paper round each, reaching about 1 in. higher than the top of the case. Put in the mixture, arrange in the centre a star or other design cut from truffle or chilli, and pour over a little melted aspic. Leave the soufflés until they are set; then draw off the bands of paper. *See* Bacon; Carving; Chicken; Glaze; etc.

Hamamelis. *See* Witch Hazel.

HAMBURG FOWL. One of the most graceful and attractive of fowls, the Hamburg is a fine layer where a good strain is secured. It does better on a wide range than in confinement. The best known colours are the blacks, gold, and silver spangled, and gold and silver pencilled. *See* Fowl; Poultry.

HAMMER. The commonest type for metal-worker's use is that known as the engineer's ball-peine hammer, Fig. 1. These are made in all weights, from ¼ lb. to 4 lb. or more, the weight being that of the head, or metal part, of the hammer, which is of cast steel, with an ash or hickory handle. For use in ordinary woodwork, a Warrington hammer or an Exeter pattern hammer is convenient. The former is similar to the engineer's cross peine hammer, but longer in the head. In the Exeter pattern (Fig. 2), the cross peine is set to the back of the head, and not central as in the former case.



Hammer. Fig. 1. Engineer's ball-peine hammer. Fig. 2. Exeter pattern. Fig. 3. Pin hammer in use.

The Kent pattern claw hammer is useful in the house, the claw being handy for the withdrawal of nails. Riveting hammers are made with a small cross section and a long head with a cross peine. The ball-peine pin hammers (Fig. 3) are almost as suitable for riveting, and extremely handy for driving all classes of fine tacks, panel pins, and for such purposes as fixing the bead round a window frame. The upholsterer's hammer (Fig. 4) is notable for its great length of head, and is made in two forms, one with a claw and the other, known as a cabriole, with a narrow cross peine.

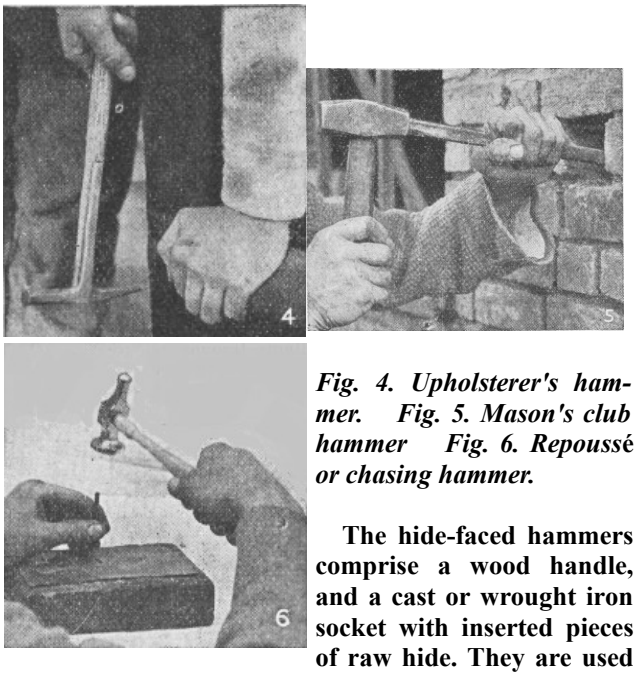


Fig. 4. Upholsterer's hammer. Fig. 5. Mason's club hammer Fig. 6. Repoussé or chasing hammer.

The hide-faced hammers comprise a wood handle, and a cast or wrought iron socket with inserted pieces of raw hide. They are used for sheet metal work, or on parts where hammer marks or bruises would be objectionable. A somewhat similar hammer is made of brass. Jeweller's or watch hammers are small and very light in weight; their use is necessary in this class of work.

Sledge hammers are outside the scope of amateur work, except perhaps the 3 lb. hand sledge or smith's hammer, which is often useful for small forging jobs worked cold in the vice. A somewhat similar hammer is the mason's club hammer (Fig. 5). The lath hammer has a flat face for driving the nails, and a broad axe-like face for cutting the lath. Chasers or repoussé hammers (Fig. 6) have a face large in diameter and a ball or other shape peine.

Fitting a Handle. When fitting a hammer head to a handle the end of the handle is shaped to fit tightly through the eye of the hammer. A slot is cut in the end of the handle, and a thin metal or hardwood wedge driven into it. Very often the hammer head and the end of the handle are first dipped into water, as this causes the wood to swell and makes the handle fit tight. Generally speaking, the lighter the hammer, the longer and finer the handle, a more effective blow being struck when the handle is resilient. Claw hammers and some others are provided with forged ears or side plates, which are fitted to the side of the handle.

After heavy wear a hammer may require re-grinding to restore the smooth and true surface of the face, which is essential to accurate work. If the head gets slack on the handle it should be refitted, otherwise it is liable to fly off. No hammer should be used except

when its face is clean and dry. Oil or glue on the face will cause the hammer to slip, and painful bruises may result. *See* Amateur Carpentry; Claw Hammer; Nail; Repoussé; Tool.

HAMMER TOE. In this condition the toe is bent upward at the first joint and downward at the second. The second toe is most commonly affected. It may be due to wearing short and narrow boots, and is often associated with hallux valgus, or displacement of the great toe towards the middle line. Claw foot is usually accompanied by some degree of hammer toe. Corns form on the parts pressed on, with resulting pain and discomfort. In the early stages the condition may be rectified by wearing well-fitting boots and perhaps a splint; but generally an operation is necessary. *See* Boots; Clawfoot; Foot.

HAMMOCK. In the domestic sense, the hammock is a swinging seat fixed up in the garden, and may serve on occasion for a bed. There are numerous types, varying from the simple article made of cord or canvas and slung between two trees, to elaborate devices fitted with specially constructed stands, spring mattress and cushion beds, wind shields and awnings. Simple hammocks vary in prices from 10s. to 50s. A padded couch hammock with an adjustable canopy, and upholstered in gaily striped canvas, is considerably more expensive, especially a model with a patent adjustable tea tray.

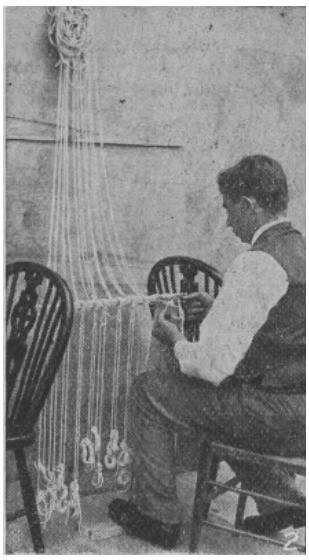
A simple form of hammock may be made by taking a piece of stout canvas and turning a very strong hem at each end, inserting through each a 1 in. diameter hardwood rod. Strong ropes are fitted to the extremities of the rods, an eyelet or thimble being worked into the bight of the rope. The hammock is suspended by chains or ropes hooked into or passed through these eyes. Another style of hammock is made from separate strips of webbing, such as is used in upholstery work; a good plan is to make the stretchers first and to fix them on to the back of a chair, so that they are at the desired distance apart. A sufficient quantity of webbing having been obtained and cut off to the proper length, the outer pieces are applied to the stretchers, putting a double thickness of webbing at each side and securely sewing them together.



Hammock. Fig. l. Hammock of netting hung between two trees.

Other long pieces of webbing are then spaced about 1 in. apart, folded round the stretchers and sewn together at the joints. Those in the centre should hang down a few inches below the line of the side pieces. The cross pieces should be placed underneath the long-way pieces and sewn to each of them. They may be spaced about 2 in. apart. The hammock is suspended by ropes.

Fig. 1 shows a netting hammock suspended between two apple trees. Any good-quality twine or string may be used, picture cord or stout cotton cord. The hammock can be made like a net with shuttle and cord, and another method is to tie the cords together, using a reef knot. To make a hammock about 12 ft. long, which is the usual length, will require a set of cords each measuring 18 ft. long; these are arranged in pairs, and 24 pairs are required. Work is commenced in the centre by looping the pairs of string round a stick such as a broom handle, supporting this at each end on the backs of chairs so that the stick is at a convenient height; the loose ends are hung up out of the way while the first half of the knotting is in progress, as in Fig. 2.



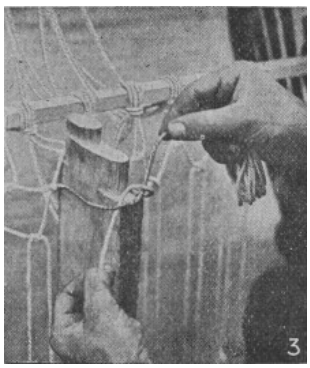


Fig. 2. Tying the first row of knots in netting a hammock. Fig. 3. Close view of first stage in tying a knot.

All the knots have to be made at the same distance apart, and to do this it is necessary to make a mesh stick or post. The latter has a foot-piece that enables it to be kept upright with the foot while the hands are free to effect the knotting. Fig. 2 shows the first stage. The mesh stick is simply a post of wood about 30 in. high, 3½ in. wide and about 1 in. thick. The upper end is shaped to an oval form, and half of it cut back to a depth of ½ in. to serve as a guide for the first row of knots; the other knots are tied around the thicker part. The shape of the top will be clear from Figs. 3 and 4.

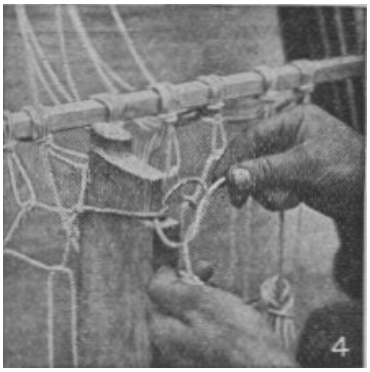


Fig. 4. Second stage, showing how reef knots are made.

Commence at the left-hand side of the centre post, and place the mesh stick against it, with the outer pair of strings separated by the mesh stick. The outside cord A is taken in the left hand and placed behind the smaller notch on the mesh stick. The cord B to the right is taken in the right hand, passed over A and held by the left hand. A is passed over and under B, then under and over B, and the result is a reef knot that will not slip. Figs. 3 and 4 show how all the cords are tied with this knot.

After tying the first pair of cords the mesh stick is removed and the next pair tied, and so on until all the 24 pairs have been tied once. The mesh stick is then used at its full width for all the remaining knots on the first half of the hammock, but instead of starting by tying the outer pair together, only the inner one of the outer pair of cords is used, as the outer cord has to remain straight. The inner cord of the outer pair is tied to the outer cord of the next pair, and so on, as in Fig. 5, continuing to the other side of the hammock, thus leaving a single cord on the outside.



Fig. 5. Second row of knots in process of tying.

The knots that make up the third row are then tied in the same order as the first, and this procedure is continued until the netted portion is about 4 ft. long. The centre bar is then removed by sliding the cords off it, and the loops smoothed out; the stick is then placed through the original second row of knots and the other half of the hammock is tied as before, starting the first row of the knots with the full width of the mesh stick. When all the cords are knotted in this way the ends are brought together and worked around the end rings, and the hammock is ready for use, but can be embellished with a pendant fringe, if desired, attached to the sides of the hammock. The hammock is suspended by chains or ropes, as shown in Fig. 6, or can, as before stated, be slung between two trees. *See* Garden Furniture; Knot; Netting.

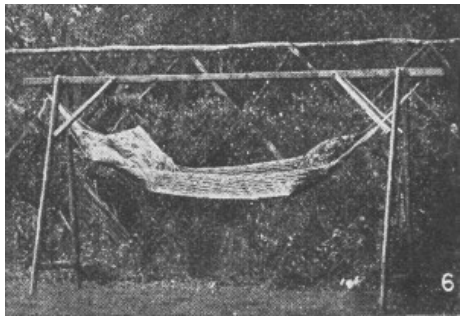


Fig 6. Simple stand for use with the hammock.

HAMPER

. A hamper is a large basket usually made of wicker or cane and fitted with a lid. It is used by laundries for conveying clothes, and also by many persons for carrying food to race meetings, picnics, and the like. *See* Basket; Picnic.

HAMSTER. This fur, obtained from the rodent of the same name, is cheap and of hard-wearing quality. Short and shading from yellow to grey, with curiously shaped black markings down the back, it is used chiefly in the form of linings for winter coats. *See* Fur.

HAND. The utility of the hand mainly depends on two factors: namely, the power to oppose the thumb to the other fingers so that we can grasp implements, and the large amount of brain surface devoted to its surface.

A wound of the upper part of the palm may divide one or both arches and lead to very free bleeding. It may be arrested by putting a firm pad of moderate size over the wound and making the hand into a fist over this; then applying a firm bandage and supporting the hand, well elevated, on a lesser arm sling. If some difficulty is experienced in checking the bleeding, the brachial artery should be compressed, an improvised tourniquet being applied if necessary.

Care of the Hands. Well-shaped, supple hands with long, smoothly jointed fingers, nicely kept nails, and skin which retains its softness and delicacy of tint in all weathers are a rare but important point of beauty culture. Although structural shape cannot be altered, much can be done to improve appearance and render defects less noticeable, but it is the constant everyday attention which counts; spasmodic treatment is of little use.

Unsightly hands are a drawback, causing a feeling of discomfort which renders their possessors self-conscious. Those who suffer from red, swollen hands in cold weather should pay particular heed to general hygiene, as well as to local care. Regular massage and electrical treatment are beneficial in many cases. Vigorous scrubbing with a soft nailbrush when washing stimulates the circulation, and it is a good habit, after the use of hot water, to run the cold tap over the hands before thoroughly drying.

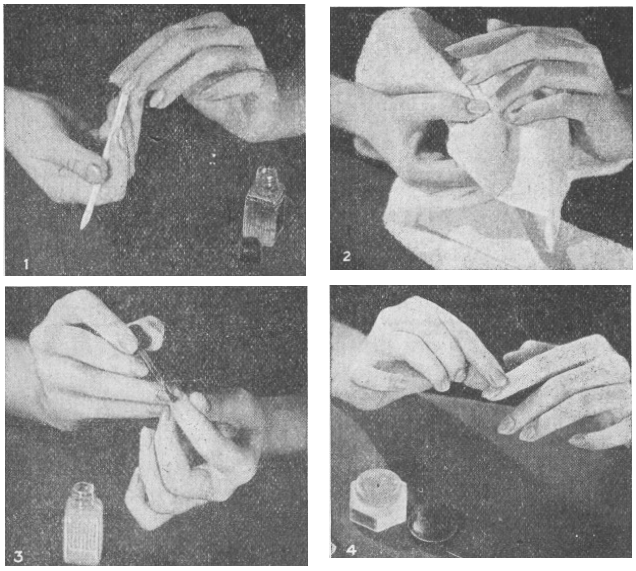
A pure toilet soap—that is, one which does not contain free alkali and is made of the best quality of fats—should be used to cleanse the hands. A night treatment is started by washing and kneading them well in the soapy lather, drying on a soft towel, care being taken to press down the cuticle of each nail in turn, massaging a hand balm into the skin and leaving a liberal allowance of the emollient on the backs of the hands, to be protected during the night by a pair of loose wash-leather gloves from which the tips of the fingers have been cut.

An excellent balm for this purpose, adapted from an old French prescription, is made by mixing 2 oz. hydrous lanolin with ½ oz. olive oil and ½ oz. almond

oil in a warmed mortar or in a basin placed over hot water; beat in 2 drams zinc oxide and 1 dram boracic acid until quite smooth, and then, while continuing to beat the cream, slowly add ½ oz. orange-flower water with which 2 drams of glycerin have been mixed.

This balm has a smoothing and whitening effect on the skin, and should be applied at least three times a week. A little glycerin jelly may be massaged into the hands on other nights, or a bleaching lotion made of 4 oz. rose water and ½ oz. each of hydrogen peroxide and strained lemon juice may be used when it is desirable to reduce redness or tan from exposure or freckles. Warmed buttermilk is a good and soothing bleach.

For chapped hands, the use of glycerin and rose water is a simple but efficacious remedy. Great care should be taken, especially in cold weather, thoroughly to dry hands which are liable to roughness. A little fine oatmeal rubbed over the skin after drying absorbs any moisture.



Hand. The principal stages in manicure. Fig. 1. Clean the nails with cotton wool soaked in peroxide. Fig. 2. Press back the cuticles after washing. Fig. 3. Paint on the nail varnish in firm downward strokes. Fig. 4. Use a hand cream at night.

Loose gloves should be worn when doing rough work, and after laundry or washing-up glycerin jelly should always be applied. Stains are best removed by pumice-stone, which is also helpful for rubbing down hard skin on the finger-tips or palms of the hands. Lemon juice is of constant use. Half a cut lemon should always be kept on the wash-hand stand or by the sink. Rubbed over the hands and washed off with cold water, lemon juice tightens up wrinkled skin and removes dirt from nails when each finger-tip is thrust into the pulp in turn, and then the nail is carefully cleaned by means of an orange stick, its point wrapped in a shred of cotton wool.

Before starting any work which may soil the nails it is a good plan to dig them into white powder—cornflour will do—-leaving it under the nails until the work is finished and then removing the powder with an orange stick, when the nails will be perfectly clean.

Perspiring hands are a great nuisance and a source of expense in the matter of gloves. Washing with formalin soap at night is often recommended, and a good hand astringent applied regularly in the daytime. The following powder may be dusted over the palms after washing, or before putting on gloves: Powdered starch, 2 oz.; powdered talc, 1 oz.; powdered alum, 15 grains.

If hands are kept in good condition, ten minutes devoted to them will further improve their appearance when desired.

The nails should be filed and then nicely shaped with an emery board. They should not be filed down at the sides (a common fault) as this removes the support from the tip, causing it to break. They should be cleaned with a piece of cotton wool soaked in peroxide (Fig. 1) round the end of an orange stick. The hands should then be washed and dried carefully with a soft towel and the cuticle pressed back with the fingers (Fig. 2). Nail varnish can be obtained in liquid or cream form, in varying colours. It should be applied evenly in firm, downward strokes to the end of the nail (Fig. 3) and wiped off the end with cotton wool, or not, according to taste. A greaseless hand lotion or cream can then be worked into the hands from finger tips to wrists. A greasy cuticle cream, and hand cream, can be applied at night (Fig. 4) and cotton gloves worn if desired. Many are the hand preparations nowadays marketed; but women know how essential, too, are graceful movements of the hands, lest the trouble of manicure be wasted by clumsiness. *See* Bandage.

Hand. This measure of length, which is used for measuring horses, is one of 4 in. *See* Horse.

HANDBAG. Small bags that can be carried in the hand are of two main types, those carried by women for purses, travelling or shopping, and those carried by men. The former are made in a great variety of styles and materials, and some are beautifully ornamented and fitted.

Handbags as carried by men have been largely supplanted by attaché or despatch cases, but bags are still seen. These are mainly of leather, and are provided with a lock and key. When purchasing one care should be taken that the fastenings are sound and the bag well lined and finished. The leather is cleaned as are other leather articles. *See* Attaché Case; Bag; Leather.

HAND BELL. Hand bells are still used to some extent in the home, although they have been largely supplanted by electric bells and gongs. The better ones usually are made of brass, either genuinely antique or reproductions of old designs. *See* Bell; Gong.

HANDKERCHIEF. Fine handkerchiefs are of pure linen with hand-embroidered initials. Coloured varieties may be of linen, but are more usually of some thinner fabric, such as cotton cambric or a silk that

may be boiled without losing the original colour. Women's fancy handkerchiefs are made of crêpe-de-chine, silk, ninon, floral chiffon, or are lace-trimmed. Men's handkerchiefs are 16 in. to 18 in. square, and may be of silk, linen, or various cotton fabrics, white or coloured. Contrasting borders are frequent.

All handkerchiefs except the purely decorative varieties should wash readily and without losing colour. White handkerchiefs should be boiled or, if that is not possible, soaked in water and lemon juice for several hours to keep them white. Coloured ones need washing in moderately warm water. All kinds should be ironed damp. The hems, which are of doubled material and hold the damp longer, should be ironed first, otherwise the moisture from them will penetrate into the already ironed centre portion and spoil its appearance. When ironed flat they should be folded, and each fold ironed down.

Machine-made handkerchiefs for everyday use can be bought so cheaply that few people make their own. Real silk and linen handkerchiefs, however, are worth the trouble. The following method involves the use of a very easy drawn-thread work, and is consequently only suited to materials with a thread that draws readily.

For a woman's handkerchief take a 12 in. square of linen, drawing threads to make sure the edges are straight. An inch from each edge draw a thread straight across, then draw the thread immediately inside this one just far enough to get an end long enough to tie. Take a strand of filoselle silk or stranded cotton at least 24 in. long, double it, and tie the end of drawn thread to the looped silk.

This done, draw the thread out gently and gradually from the opposite end. As the thread is pulled out from one end it draws the doubled coloured silk tied to it into its own place at the other, leaving a line of perfectly woven colours stretched across the handker-chief. Two or three coloured threads ½ in. apart along each edge make a charming decoration to the handker-chief, which is then hemmed down very neatly to the outermost line of colour, and may be embroidered in one corner if desired. Men's linen or silk handkerchiefs should be made in the same way, choosing suitable colours, and may have an embroidered monogram in one corner.

Various methods of trimming coloured handkerchiefs are employed. Sometimes the whole handkerchief is coloured, with the merest line of white at the edge in the shape of a rolled hem; while in other cases the order is reversed, the handkerchief being white, bound with a colour. Widely striped borders are used as well as veining edges in a pale colour, with small initials or monograms to match. Cross-stitch is introduced in others for ornamental corner designs.

The fragrance of fresh violets may be imparted to handkerchiefs without the use of scent. Tie a few pieces of orris root in a muslin bag and put the latter into the water in which the handkerchiefs are boiled. When dry they will be found to be delicately perfumed. *See* Hemstitch; Initial; Laundry.

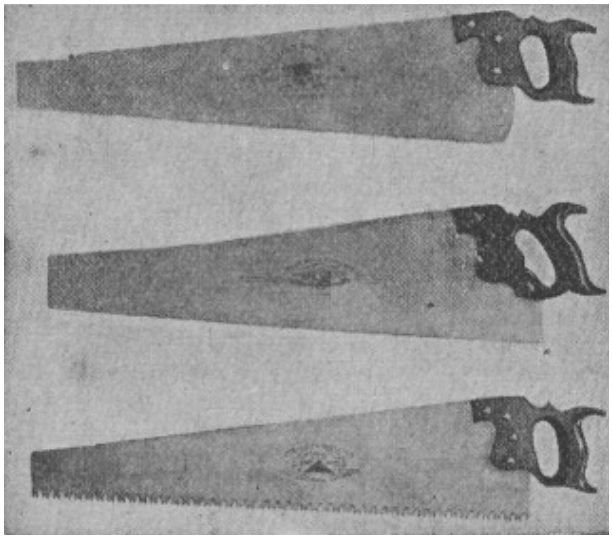
HANDKERCHIEF SACHET. The most serviceable sachets are those made of fine white lawn, muslin, or linen embroidered or trimmed with drawn-thread work, as they can be washed repeatedly.

More elaborate sachets are made of fancy and plain silk, crêpe-de-chine, satin, velvet and ribbon. These are usually padded and ornamented with embroidery. Silk cord and ribbons are utilized to form fastenings.

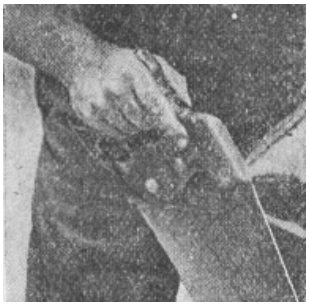
A simple sachet can be made by folding in half a padded length of satin 18 in. by 10½ in. The outside can be made of embroidered satin, of taffeta, or of a tinsel brocade, and the lining of some pale self-colour. Gold or silver cord is sewn round the edge, and is also used to make fastening loops. *See* Drawn Thread Work; Embroidery.

Handle. *See* Door.

HAND SAW. There are many types of hand saw, the straight-backed pattern illustrated being suitable for most work. These are made in various lengths, from 20 in. to 30 in., with teeth of different shape. Saws with ratchet-shaped teeth are preferable to those of the pyramidal shape, and the 26 in. size is handy for general use.



Hand Saw: three types. Top, London pattern; centre, skew back; bottom, farmer's saw.



Left, method of holding; note position of thumb and forefinger.

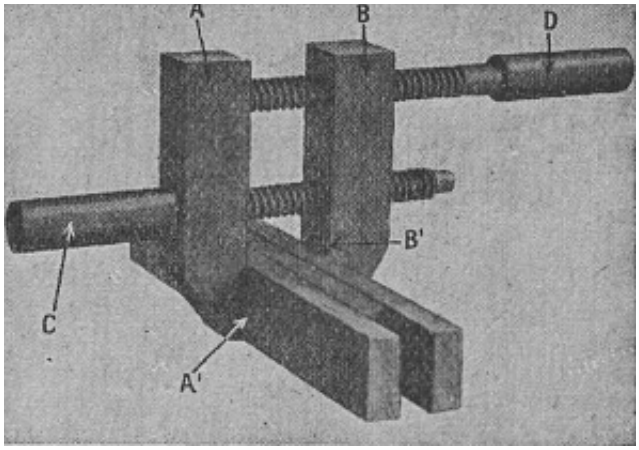
Hand saws in general are intended for two classes of work. The cross-cut saw is for cutting across the grain; the rip saw is better adapted for cutting or ripping timber in the direction of the grain, the teeth being larger. The handle is held with the first finger of the right hand extended along the right-hand side of the handle and the right thumb along the left-hand side of the handle, as in the illustration. For ordinary

household work, the crosscut saw will answer most requirements.

Another type, known as the farmer's saw, is made with teeth of a different shape, a number of notches being cut at regular intervals along the edge of the blade, thus enabling the saw to cut wet timber. This type is indispensable where rough logs have to be sawn up, as for firewood. *See* Cross Cut Saw; Saw.

HAND SCREW: Its Uses. Hand screws are a useful form of cramp, used by wood and metal workers. They consist essentially of two blocks, which are drawn together by the rotation of two long screws fitted with hand grips. Those favoured by wood-workers are usually made of hardwood throughout. An improved pattern is made in pressed steel, and adapted for grasping work that is tapering or of irregu-lar shape. Hand screws intended to be used for metal work are generally smaller in size. These tools are employed on work such al holding one part to another to act as a drilling jig or guide piece while preparing a duplicate.

The woodworkers' hand screws are invaluable to the home worker. They can be employed to hold together the corners of a light framed building in course of erection. They serve as a clamp when glueing up joints, and another use is clamping a piece of work down to the work bench. They should always be kept in a dry place, otherwise the wood screws are liable to swell and work stiffly; this can be remedied by coating the thread with black-lead. Unless they turn freely, much of the strength of the grip will be lost, and there is a risk that the screw will be twisted asunder.



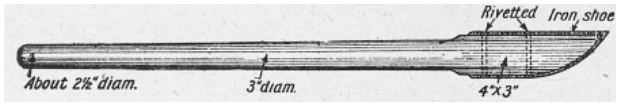
Hand Screw: method of action. A key to the lettering will be found in the text.

The diagram clearly illustrates the action of the appliance. A and B are the two blocks whose movement is controlled by the two screws C and D, A^1 and B^1 being the jaws or gripping faces. The screw C passes freely through a plain hole in A, but screws through B; D also screws through B, but the end of D works freely in a blind hole in A; both screws are right handed.

In order to bring the jaws A^1 and B^1 closer together while keeping their faces parallel, C is screwed up while D is unscrewed by an equal amount. When the jaws have thus been brought near enough together the clamp is put in place and C is screwed up and D unscrewed at the same time, so that the jaws are home on the work. If the jaws are biting tighter at the throat than at the tips, C must be unscrewed a little and D screwed up by a larger amount; if, on the other hand, the jaws are slack on the job at the throat and tight at the tips, D must be unscrewed a good deal and C screwed up a little. This method of adjustment also enables the tool to be used to hold jobs whose opposite faces are not parallel.

When the clamp has been adjusted to press evenly on the work, it is tightened by first screwing up C quite tight and then screwing up D as far as it will go; this order is adopted because D has a bigger leverage on the job than C. To release the clamp, first unscrew D till it is quite free, and then unscrew C.

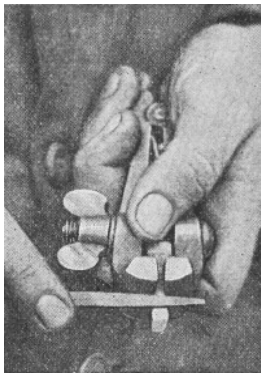
HANDSPIKE. This is a long bar of wood about 3 in. in diameter, tapering at one end, the other shaped in the form of a shoe and clothed with iron. Its general appearance is illustrated, and the implement has many uses in the handling of heavy articles. The shoe should be inserted underneath the sack or other object, and it can be raised slightly by depressing the handspike.



Handspike. Long bar of wood, capped with metal at the tip, used for lifting stones and other heavy articles.

For domestic purposes a useful implement can be made from ordinary deal about 4 in. wide and 3 in. thick, shaped on the lines illustrated. The iron shoe should be fitted if possible, as it adds greatly to the effective strength of the implement, and can be bent from a piece of wrought iron 1 ¾ in. wide, ¼ in. thick, and 18 in. in length. It may be secured by screws, or preferably by riveting with long rivets. *See* Lever.

HAND VICE. A small vice that can be held in the hand is a very adaptable tool that can be turned to many uses in the home. It is useful for a great many small filing operations, as it can be turned about in any direction. The ordinary black pattern is shown in the illustration. Another type with wooden handle and a parallel action to the jaws is useful for fine work, such as model making or clock repairing. In choosing a hand vice note that the jaws close up evenly, that they are free from shake, and that when closed they are quite true and level on the upper side, the faces in close contact. *See* Amateur Carpentry; Vice, etc.



Hand Vice. Manner of holding and method of use for small work.

HANGING: Of Meat. The length of time required for hanging meat depends mainly on the weather. English beef and mutton, if kept in a well-ventilated larder and the weather is cold, may hang for 2 or even 3 weeks in carcass. In summer, on the other hand, meat should not hang more than a week.

Mutton keeps better than beef, and all meat keeps longer in the carcass than in joints; but it should always be hung up in the larder and never laid on a dish on the shelf. Always remove the kernels if meat is to be hung, also the marrow, as both have a tendency to become tainted and infect the meat. The flesh of young animals cannot be hung so long as that of older beasts. Foreign meat should not be hung, as it will waste; it is supposed to come from the butcher ready thawed and in condition for cooking. When the weather is frosty, however, all meat is better for hanging some hours in a warm place after being exposed to the frosty atmosphere during carriage. Pork and veal should not be hung longer than is necessary before cooking, as they taint very quickly.

The time varies for hanging poultry. In warm weather fowls can be hung only for a day, and that must be in a cool, well-ventilated place. In winter hang them for about 4-6 days. Turkeys in very cold weather may hang as long as a fortnight, but the time must be regulated by the weather. Geese should hang some days, pigeons for a few days only. In cold weather venison may be hung for 14 days, but it must be examined occasionally. An old hare can be hung for 10 days, but a young one not more than a week, and neither should be paunched before 4 days have elapsed. Game may hang any time from 10 days to 3 weeks if the weather is cold, but neither venison nor other game is now eaten very high. Birds keep better if the feathers are left on and they are undrawn. It should be remembered that poultry is hung by the feet, game by the neck. *See* Food; Game.

Hanging Cupboard. *See* Cupboard; Corner Cupboard.

HANK. A hank is two or more skeins of wool, thread or silk tied together. Silk, both real and artificial, as used for knitting, is often sold in hanks. *See* Knitting; Silk; Wool.

HAPPY FAMILY. For this card game, which is best played by four persons, a specially prepared pack is necessary. A pack consists of 44 cards, each containing a fantastic figure representing a member of one of the eleven families. Each family has four members, Mr., Mrs., Master, and Miss, and each is pictured with the implement of the family trade, e.g. a bone for the butcher. The names given to the families vary, but the most popular are as follows: Block the barber, Bones the butcher, Bun the baker, Bung the brewer, Chips the carpenter, Dip the dyer, Dose the doctor, Grits the grocer, Potts the painter, Soot the sweep, and Tape the tailor.

The game consists in each player in turn asking any one of the others for a card he himself has not got, but he can only ask for a member of a family which is represented in his own hand. The player to the left of the dealer begins. If he asks for a card which the person asked possesses, it is handed over and he asks again, continuing until he asks for a card which the player asked does not possess. The latter thereupon answers "not at home," and it becomes his turn to ask. Each player aims at getting the four members of one family into his hand, and each family counts one trick. The player who secures the most tricks wins.

The game may be continued as follows: The players in turn ask for whole families instead of for single cards, under the same conditions as before, and continue until all have passed into the possession of one player.

HARDBAKE. Hardbake is a simple form of toffee, its chief constituents being sugar and butter. Almonds or other nuts may be used to give it a flavour. *See* Almond Toffee; Toffee.

HARDENING AND TEMPERING.

Tough though it is, tool steel in its soft or annealed condition is not hard enough to resist hard wear. Tools must therefore be hardened, after being made, by heating them to the correct hardening temperature and plunging them into a quenching bath. Tool steel so hardened has the defect of extreme brittleness; this can be overcome by tempering, raising it gradually to the appropriate temperature and then plunging it in cold water. The process of case hardening is quite different, and is dealt with in a separate article.

The art of hardening and tempering tool steel consists in getting the correct hardening temperature for the particular steel, choosing the right liquid for the quenching bath, having in view the use for which the tool is intended, and getting the distribution of tempering temperature in the tool so arranged that the different parts of the finished article are all of suitable hardness and toughness for their particular work.

Tool steels vary considerably in composition, and each has its own special colour of red heat for hardening. Each steel that is used for making tools loses its magnetic qualities entirely at and above a certain temperature, which is identical with the ideal hardening temperature in every case. This fact enables the hardening operation to be carried out with certainty by the use of an ordinary pocket compass; but attention must be paid to avoiding complications from the presence of such iron articles as stoves, fenders, fire irons, etc., near the compass. In particular, iron or steel tongs or pincers must not be used for handling the red-hot tool.

The procedure recommended for hardening a tool is to hold it by tying a piece of stout copper wire round the middle, and place the pocket compass on the floor a yard or so away from any iron, but within convenient reach of the fire and the quenching bath, remembering that if the bath is of tin or enamel it must not be too close to the compass. Any fire will do for the work if it

is hot enough; a hot coal fire or a paraffin blow lamp is satisfactory, or even a gas ring if the tool is not too big. Then the tool is to be made red hot in the fire and tested from time to time by withdrawing it by the copper wire, and holding it close to, but at one side of, one end of the compass needle.

If the needle responds by a movement, the steel is not yet hot enough, and must go back in the fire; but when the steel is so hot that the needle disregards its presence, the tool is to be plunged at once into the quenching bath and moved rapidly about in it till it is cold enough to handle, when it may be withdrawn and wiped dry. When transferring the tool from fire to compass and from compass to bath, the movements must be smartly carried out to avoid any unnecessary cooling of the red-hot metal.

In heating it is essential that the tool should be of a uniform temperature all over. Evenness of heating is readily secured by turning the tool about so that any part that is noticed to be at a darker red than the rest comes in a hotter place in the fire and so catches up to the general average temperature.

In quenching, a rapid agitation in the bath is necessary to secure even and rapid cooling. The bath is simply any kind of vessel containing enough of the quenching liquid to ensure that it does not get much heated when the red-hot steel is plunged in it.

Various liquids are in use. Cold, fresh water, soft, not hard, is satisfactory in most cases. If, however, it is found that a tool quenched in water cracks, oil should be tried, and any lubricating or other heavy oil will be found to overcome the difficulty.

Tempering. After hardening, the tool has to be tempered. This is done by raising it slowly to a temperature which depends on the use to which the tool is to be put, and then quenching in cold water. Steel has the property that when it is clean and heated slowly in air a thin film of oxide forms on the clean surface, and the colour of the film changes progressively as the temperature rises. First a pale straw colour appears and gradually deepens to brown, then the brown gives place to a purple, which presently clarifies into a clear violet; next the violet turns dark blue, and finally the blue fades out.

After hardening, therefore, the tool is first rubbed bright with emery cloth, taking care not to touch it with the hand, as the slightest trace of grease prevents the proper formation of the temper colours; then, if it is required to be at the same temperature throughout, it is laid on an iron plate, which is placed over a flame. The succession of colours is watched, and the tool is quenched at once when the desired colour is reached. If by accident the colour changes have advanced too far before quenching, the tool must be hardened and correctly tempered all over again; but if the colours have not gone far enough, it may be repolished and retempered without hardening.

Most tools require to be of a certain hardness on the point or working end, but to be softer in the shank and at the handle end. This result is obtained by taking the tool by the middle in a pair of pliers and holding the butt end in a flame such as a blow lamp or gas ring; the series of colours then passes along the tool, which is quenched when the desired colour reaches the point. If it is desired to keep the hard region near the point as much as possible, the butt end must be put well into a hot flame, when the successive colours follow each other so closely that the bulk of the tool is soft.

To obtain the reverse effect, i.e. a tool which is of progressive hardness over a considerable length of the point end, the tool is caused to warm up more slowly by occasionally withdrawing the butt end from the flame; the colours then follow down the tool at longer intervals so that the hardness extends for some distance from the point. Slow tempering is preferable to fast tempering, as it is easier to carry out accurately, and tools so tempered are more satisfactory in use.

When tempering, a very pale straw colour is used for reamers; light straw for twist drills and tools for turning metals; dark straw for woodworking tools in general and for taps and dies for screwing metal; brown for hatchets and chipping chisels; and dark purple for springs. *See* Case Hardening.

HARDENING-OFF. This is the process of treating plants grown under glass to render them fit for planting out of doors; it is carried out by gradually inuring them to cooler conditions. They are transferred from greenhouse to frame; the frame is at first kept closed, and after a week the ventilation is increased gradually until finally the top of the frame is removed.

HARD STOPPING. Usually a mixture of resin and beeswax, hard stopping is employed to fill up small holes and defective places in woodwork, being first warmed and then worked into the cavity with a warm knife. A superior variety is known as beaumontage (q.v.). Various proprietary mixtures can be purchased ready for use from the oil and colour shops.

HARDWARE. This is the name given to all kinds of household and other articles that are made of the baser metals, especially iron and copper. Among them are the ordinary cooking and kitchen utensils, fire irons and tools of all kinds. *See* Baking; Copper; Hammer; Kettle; Lawn Mower; Nail; Poker; Tool Chest, etc.

Hard Water. *See* Water Softener.

HARDWOOD. The various woods are divided into two classes, hard and soft. Of the former there is a great variety, but the softwoods are few in number and belong to coniferous trees. Those in common use are pine, spruce, fir, and pitch pine, the first three coming under the general head of deal.

Chief among the hardwoods are oak, mahogany, walnut, elm, ash, birch, beech, greenheart, teak. They are mostly heavy woods compared with ordinary deal, and more power is required to cut them with chisel or plane. The grain is often more curly than that of the

soft varieties, and the cabinet maker has to finish with a scraper, because a plane tears up the grain in some kinds.

Hardwood of some particular kind may be selected because it is better adapted for the purpose required, or its appearance may be the main consideration. Colour or the figure of the grain may make it desirable, though, as far as utility is concerned, it may be no better than cheaper woods. This is the case mainly in furniture. Hardwood costs more than soft, and some varieties of it cost far more than others. It is usually sold according to size, at so much per foot; in a few cases, where the wood is heavy and scarce, it is sold by weight. *See* Beech; Elm; Oak; Walnut; Wood, etc.

HARE. Caught in the leveret stage, hares, though by nature timid, are easily tamed, and will appeal to those who like a pet out of the common. They require a large roomy hutch, and may be fed principally on greenstuff, suph as lettuce and cabbage tops, and bread. The hare does not breed in confinement.

How to Cook. It may be roasted, jugged, braised, or cooked in other ways. After cleaning, wash the hare quickly in lukewarm water and dry it with a cloth.

Braised Hare. To braise a hare, skin and clean it, and line the inside with slices of fat bacon. Chop the heart, liver, and kidneys, adding to them 1½ oz. chopped calf's liver, the same quantity chopped fat bacon, 3 oz. breadcrumbs, a small chopped onion, and 2 teaspoonfuls each of chopped herbs and parsley. Season these to taste and bind them with 2 beaten eggs. Put the stuffing inside the hare, sew the latter up, and cover the back with a piece of raw fat bacon. Wrap the whole in buttered paper.

Cover the bottom of a long braising pan or fish-kettle with some bacon trimmings, 2 onions, 2 sticks of celery, a carrot, and a turnip, and lay the hare on these, adding a bunch of herbs, a pint of good stock, season-ing, and, if liked, 2 glasses of sherry. Cover the pan closely and braise its contents over a low fire for 3 hours, basting the hare occasionally with stock and renewing the latter whenever necessary. When almost cooked through, take out the hare, remove the paper from the back, and strain off the stock, at the same time skimming off any fat. Pour a pint of good brown sauce into the pan, put back the strained stock and the hare, and finish cooking. Serve the hare with the sauce poured over it, garnish with thin rolls of fried bacon, and hand round some red currant jelly.

Jugged Hare. A hare that is to be jugged should be cleaned, cut into joints, and the blood reserved. Wash the head, heart, and liver in cold salted water, and put them into a saucepan with the blood and bones. Add 4 pints of cold water and a teaspoonful of salt, and bring the stock to the boil. Remove the scum, add a few mixed herbs tied in a piece of muslin, a little powdered mace, and pepper to taste. Scrape and wash a carrot, and add it to the stock with an onion, peeled and stuck with 3 or 4 cloves. Simmer the whole for 3 or 4 hours, keeping it well skimmed.

Dredge the joints of hare with flour and try them to a light brown colour; then place them in a large brown jar or casserole. Mix 6 oz. flour to a smooth paste with water, and add it to the stock previously strained into another saucepan. Stir these well, boil them for a few minutes, and, if necessary, add a little browning. Strain the gravy over the hare, just covering it, and reserve about 1 pint in which to cook the forcemeat balls (q.v.). Put the casserole in a moderately hot oven, bring its contents to the boil, and then simmer it for about 2 hours.

The forcemeat balls should first be rolled in flour, then fried, and afterwards put into a saucepan with the remainder of the hot gravy and simmered for about ½ hour before the hare is ready to be served. Just before sending the latter to table add a wineglassful of port wine.

Roast Hare. For roasting, a young hare is best, preferably under a year old. First press some forcemeat inside, and sew it up with a trussing needle and fine string. Truss as for roast rabbit, tie a few pieces of fat bacon over the top, and cover with greased paper. Cook the hare in a moderately hot oven, basting it frequently with milk and dripping. When it has almost finished cooking take off the bacon and greased paper, dredge the back with flour, and continue roasting. Untruss the hare when done, and serve it with the gravy thickened with flour and flavoured with port wine and red currant jelly. Red currant jelly may also be served separately, and bacon rolls used as a garnish.

Hare Forcemeat. This is made by part boiling the liver, heart, and kidneys of a hare, and then adding an equal quantity of grated breadcrumbs, twice as much fat bacon, chopped finely, and a piece of butter about the size of a walnut. Mix these well, season them with salt, pepper, nutmeg, a tablespoonful each of chopped thyme and parsley, and a little grated lemon rind, and bind the whole with a well-beaten egg.

Hare Pie. To make this pie, soak a hare in warm water for 15 min., then wipe it dry, cut it into joints, and season it with salt and pepper. Fry these until they are golden brown on both sides, reserving the head and any other inferior parts for the making of jugged hare, etc. Line the edge of a pie-dish with short-crust pastry, and arrange in it the joints of hare, the minced liver, a sliced onion, a teaspoonful each of chopped parsley and thyme, and seasoning to taste. Lay on these four rashers of bacon and pour over all ½ pint of gravy to which ½ glass of claret or port wine has been added. Cover with some more short crust, and bake the pie in a moderately hot oven until the crust is brown. Then reduce the heat and continue cooking. In all, the pie requires about 1 ½ hours. It is sufficient for about six persons.

Hare Soup. Half a roast hare may be used in the preparation of soup. Cut the meat into small joints and slice 3 or 4 onions, 2 carrots, and a little celery, putting these into a pan with a bunch of mixed herbs, a bay leaf, 2 or 3 rashers of fat bacon, ½ gallon of stock, and seasoning to taste. Boil the soup for 3 hours before adding a tablespoonful of red currant jelly, and then put it through a fine sieve. Re-boil it, adding more stock if necessary, and pour in a tablespoonful of Worcester sauce or sauce and ketchup mixed. Add also a few forcemeat balls and a glass of claret or port wine. Serve with fried croutons. *See* Game; Pastry.

Hare Fur. This fur, though not hard wearing, has soft, long fine hair and forms a favourite trimming for evening wraps. Generally it is dyed to imitate the more costly kinds of fur. The pure white variety is imported from Russia and Siberia. Hare fur may be cleaned according to the directions given in the article on furs. *See* Fur.

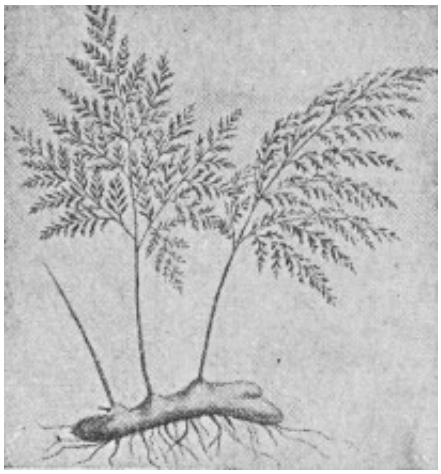
HAREBELL. The common name of Campanula rotundifolia, a perennial herb of the order Campanulaceae. It is a charming wild plant with blue, bell-shaped flowers. It grows 10-12 inches high and is suitable for planting in the rockery.

HARELIP. Children are sometimes born with this deformity, which consists of one or two splits or fissures in the upper lip. In about half the cases there is a cleft palate, a fissure in the roof of the mouth. Generally a child with harelip has a broad, flat nose.

A child should never be allowed to grow up with this disfiguring affection. The surgeon will advise an operation, and the best time to perform it should be left to his decision. In the case of strong, healthy children the operation is usually performed at the age of six or eight weeks, but if the infant is delicate it may be deferred a little longer. After six months, teething interferes with the success of the operation.

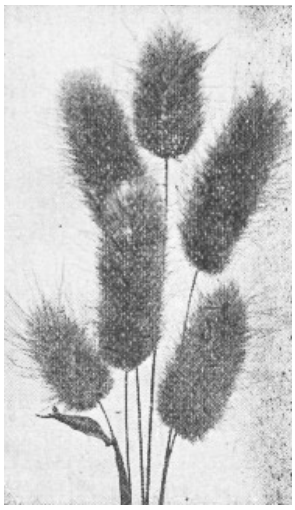
HARE'S EAR. The popular name of bupleurum. The chief kind of garden value is Bupleurum fruticosum, a shrub from Spain, 3-5 feet high, which bears umbels of yellow flowers in late summer. It should be grown against a wall except in mild districts. Propagation is by cuttings in a frame in August.

HARE'S FOOT FERN. The best known hare's-foot fern is Davallia canariensis, whose long creeping roots or rhizomes grip the sides of the pot or pan in which the fern is grown, and resemble or suggest the foot of a hare. D. bullata is sometimes called the squirrel's foot fern. These ferns should be grown in pots or pans containing a mixture of peat, sand, and sphagnum moss, in a warm greenhouse. A Japanese variety of the hare's foot fern consists of roots, or rhizomes, of D. Mariesi, fashioned into the shape of monkeys, birds, crosses, coconuts, and other designs. The plants arrive in Great Britain in the wintertime, when they are brown and dormant; in early spring, if they are hung up in a warm greenhouse and liberally watered with tepid water, they are speedily covered with masses of delicate, vivid green fronds. *See* Fernery.



Hare's Foot Fern. Indoor foliage plant with creeping brown roots.

HARE'S TAIL GRASS. This is the common name for lagurus, a hardy annual flowering grass, growing about a foot high. It grows in ordinary soil in a sunny border, and is useful for mixing with cut flowers. Seed may be sown outdoors in March or April.



Hare's Tail Grass. Ornamental grass bearing soft furry heads.

HARICOT BEAN: In Cookery. Certain sorts of French and kidney beans which have white pods and seeds are known as haricot beans. They need no special culture, but, instead of being consumed when fresh, are usually dried and stored for future use, as they are highly nutritious, and are much used in cookery, either as a vegetable or for soups and curries. They require to be soaked for about 24 hours before being cooked.

To prepare haricot beans as a vegetable, after being soaked they are put into a pan of cold salted water, brought rapidly to the boil with the lid on the pan, and then allowed to simmer slowly until they are tender. Strain them and return them to the saucepan to dry, placing the latter at the side of the fire. Add a small lump of butter or margarine and seasoning to taste; shake the whole over the fire for a minute or two, and then serve the beans in a hot vegetable dish, with a little finely chopped parsley sprinkled over them.

Haricot beans make an excellent addition to stews and other made dishes, for they serve both to thicken and to flavour. They also make an appetizing dish when curried and form the basis of vegetarian cutlets or rissoles.

Bacon and Haricots. Stewed with bacon, haricot beans make an excellent dish. Soak and boil a pint of beans as already directed, and, while they are draining, cut ½ lb. of bacon into dice. Over the latter pour some boiling water, let them stand for 2 or 3 min., and then drain them also. Put the bacon into a pan and shake it over the fire until it is slightly browned; then add to it ½ pint of good brown gravy, previously thickened with a little flour, and a large, finely minced onion. Add seasoning to taste, and let the stew simmer for about 20 min. before putting in the beans. Continue simmering for another 20 min. or so, and then serve the stew hot. *See* Butter Beans; Parsley Sauce; Tomato Sauce.

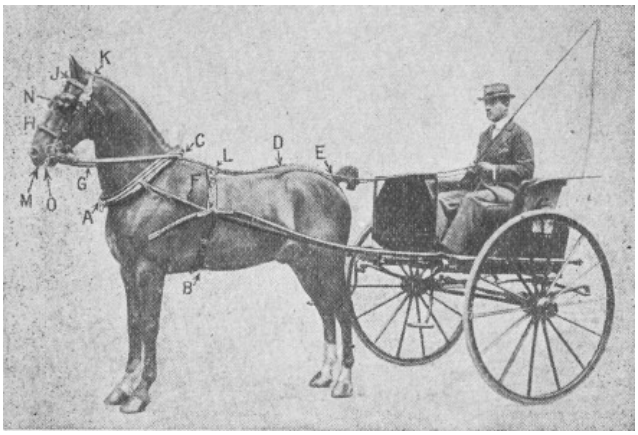
HARICOT MUTTON. This dish is generally prepared with a neck of mutton which has the breast attached, but the scrag is not used. If the dish is designed for an entrée, only the cutlets are to be used.

To prepare the haricot, cut about 3 lb. neck of mutton into neat pieces, removing all superfluous fat. Fry the meat till it is a nice brown colour, using a little good dripping to start it. A brisk heat will be required. Remove the meat and lay it in a stewpan, then pour off most of the fat and sprinkle over the hot pan about 2 tablespoonfuls of flour. Stir this over the fire until the flour is well coloured and cooked, but do not let it burn. Moisten the whole by degrees with a quart of well-flavoured stock or water and keep stirring until the liquor boils. Pour the gravy thus prepared over the meat and set the stewpan on the fire, then add ½ lb. carrots and turnips, previously washed, peeled and cut into dice or neat shapes, also 2 moderate-sized onions and a bouquet garni. Season well and let the whole simmer for about two hours.

Before dishing, skim off the fat, remove the bouquet, and place meat and vegetables neatly. If the liquor is too thin, dish the meat and boil the gravy quickly to reduce it. Haricot beans, soaked and blanched, are sometimes added to this stew. Haricot mutton cooked in a hay box is prepared in the same way except that simmering continues for 10 min. only, instead of 2 hours. The whole is then boiled quickly for 2 min., with the lid on the pan, placed in the hay box and left there for 2½ hours. *See* Hay Box; Mutton.

HARMONICS: In Wireless. These are frequencies which are multiples of another frequency, called the fundamental. Thus frequencies of two, three and four times the fundamental frequency are known as the second, third and fourth harmonics respectively. *See* Frequency.

HARNESS: Its Care. A set of single harness, i.e. harness for one horse, comprises a bridle with blinkers; a collar, with hames and traces attached; a saddle, with turret rings, back strap; crupper and breeching. The breeching is unnecessary, excepting in hilly districts, though it always forms part of a set of harness, together with the reins. Its use is to prevent the hind-quarters coming in contact with the vehicle. It is better to have a breeching strap attached to the back part of the shafts, as this gives the animal more freedom of movement, and annoys it less. Moreover it only comes into operation when it is needed.



Harness. Parts comprising a set ot single harness: A, collar; B, saddle band; C, hames; D, back strap; E, crupper; F, traces; G, reins; H, nose band of bridle; J, brow band of bridle; K, bridle band on poll; L, turrets; M, snaffle; N, blinkers; 0, check piece of bit.

The bridle is composed of a throat-strap, a brow band, cheek straps, and a bit, either single or double ringed, called a snaffle, or bit and chain. All the bridle straps have keepers, so that they can be adjusted to fit properly. The proper adjustment of the bit and the curb requires to be carefully attended to. Many horses have had their mouths and manners permanently ruined through faulty bitting; the so-called hard mouth may be produced in this manner. The curb chain ought to be so fixed as to allow it to lie loosely in the curb groove beneath the lower jaw.

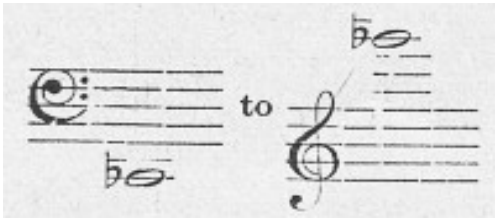
The collar necessarily forms an important part of the harness, and unless it fits properly, its movement is very liable to bruise and chafe the skin, resulting in the production of the collar gall, just as a badly fitting saddle produces saddle gall. Leather-lined collars are preferable to those lined with cloth; the carthorse's collar, lined with felt, is often used, but cannot be recommended. When a horse comes in from work the hames should be removed from the collar, and the latter allowed to remain in position for half an hour until the skin beneath the collar has had time to cool. Neglect of this precaution favours sore shoulders, owing to the sudden cooling of the skin. The same remarks apply equally to the saddle.

The driving saddle is, preferably, lined with leather, and it ought to combine lightness with strength. In addition to the turrets for the reins to pass through, the stout shaft band forms part of it, and so does the belly band. In fitting on the saddle the belly band must not be adjusted too tightly, whilst the shaft band is adjusted so as to allow the points of the shafts to lie in a straight line just below the level of the points of the shoulders, and not tilted. In the latter case the power of draught is greatly diminished and the appearance of the equipage unsightly. Sometimes a breastband is used in place of a collar, especially for trotting purposes. For

a pair of horses double sets are sold.

Neither harness nor saddlery should be kept in the stable, as the odour from the latter rots the leather. To clean harness, remove the mud by sponging, and as soon as the harness is dry rub it over with either black or brown harness paste, and then polish. Damp leather will not polish, therefore the harness must be thoroughly dry. Soft soap should not be employed as a substitute for paste, as it rots the leather. Take particular care to have the lining of the collar and saddle clean and dry. Unfasten all buckles and keepers to facilitate cleansing of both. Every horse-keeper should insist that leathers and bright parts are kept polished and burnished with regularity, and repaired immediately if damaged. *See* Horse.

HARP: How to Play. The harp has 47 strings. All but the 11 longest are of gut, each C being generally coloured red, and each F blue; the others are of steel wire wound over. The compass is from



and every note stands in the major scale of C flat.

The harp is now as it always has been, an essentially diatonic instrument, and the difficulty of making it available for use in keys other than that in which it stood was partially overcome by the invention of the single action, in which by means of seven pedals it became feasible to raise the pitch of the strings by a semitone. Erard's invention of the double action, however, made a tone as well as a semitone possible, so that notes of any pitch became available.

The mechanism by which these modifications of pitch are effected is contained in different parts of the instrument. That part which stands upon the floor is the pedestal, or pedal box, which holds the pedals. Rising from this, but in divergent directions, are the vertical pillar in front, and the inclined soundbox at the back. These are united at the top by the curved neck.

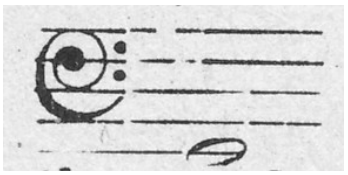
Each of the pedals acts upon all strings having the same alphabetical name; consequently there are seven of them, B, C, and D to the player's left, and E, F, G, and A to his right, the order being away from him. In the frame of the pedal box are two notches for each pedal. When a pedal is fixed in its first notch, the pitch is raised by a semitone; when in the second, by a whole tone. A spring enables the pedal to return to its static position.

It will readily be seen that as each string can thus supply the flat, natural, and sharp pitches of its alphabetical name, the key of seven flats was the obvious one to be selected. The mechanism by which the strings are shortened is placed within a portion of the neck called the comb, the connexion between it and the pedals consisting of metal rods concealed within the pillar. The tuning pegs are fixed in the neck, and it is very important to bear in mind that as the harp requires constant tuning, the performer needs always to have a tuning hammer handy for use when occasion arises. The thorough understanding of the pedals is of primary importance as the harp can not only be set thereby in any key, but also so as to make it possible to play certain chords scale-wise or even glissando. Within the limits of space available, the possibilities cannot be fully set out here. One or two simple examples must suffice.

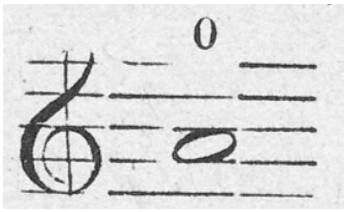
Remembering that the fundamental key is C flat, it is evident that in order to play in the key of C it is merely necessary to depress all the pedals to their first notches. To get the key of D flat or C sharp, it would be possible to fix them in their second notches, but it would be preferable to fix only the F and C pedals in their first notches. Accidentals and modulations, if not too abrupt, can also be effected by means of the pedals.

The tone of the harp is full and rich throughout the greater part of the middle compass, but the extremely high notes, owing to the shortness of the strings, are dry and brittle in character. The flat keys have a more resonant tone than the sharp keys, the reason being that in them the strings are more open.

Changes of tone colour can be got in different ways. By damping the string with either the hand or the fingers as soon as it has been plucked, a somewhat dry-sounding pizzicato, like that of the violin, is produced. By plucking the string near the sound-board with the finger-nail, a metallic tone is the result, similar to the guitar. Harmonics are another beautiful effect. They are confined to three octaves from:—



or even less, as outside those limits they are very ineffective. The only harmonic used is that produced by lightly stopping the string at half its length, with the result that the note sounds an octave higher. An harmonic is indicated thus:—

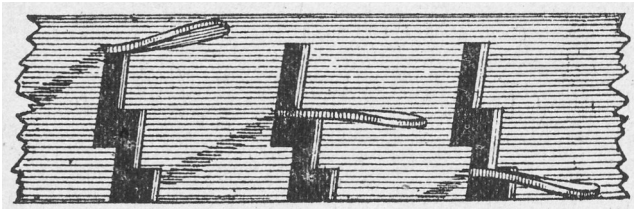


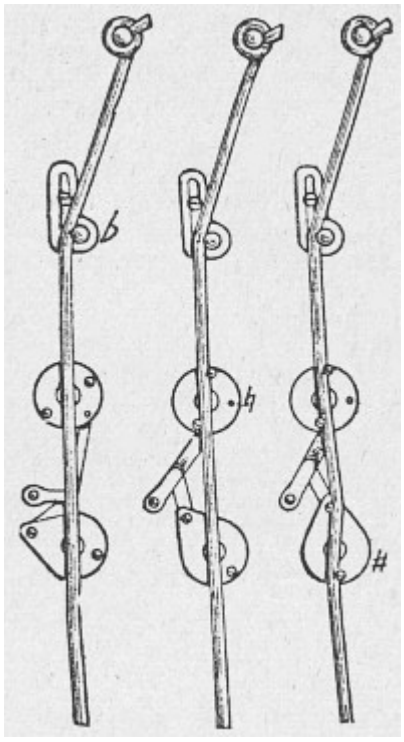
but its sounds may be set down thus:—



A harpist plays seated, and rests the hollow sound-box against his right shoulder, the instrument being tilted back to allow of this. The little fingers are not used in playing, but, owing to the closeness of the strings, a greater range of notes lies under the hand than with the pianoforte. Instead of an octave, a tenth may be regarded as the normal stretch. The pedals

required to be set are indicated by their names being given in brackets. For example, to set the harp in D flat the indication would be
(F♯ C♯). Two staves, as in pianoforte music, are required for the notation, the Fand G clefts being used. Almost invariably chords are slightly spread; when that effect is not desired, the French word sec (dry) is used. The playing in succession of two constituent notes of a chord is so characteristic of the harp, that it gives rise to the term arpeggio (in the harp style) in music. Repeated notes are possible in rapid tempo on different strings, according to the setting of the pedals, whereby enharmonic unisons, called homo-phones, are secured on adjacent strings. The glissando is another effect used. It is performed by drawing a finger rapidly over the strings, and it is applicable, according to the use of the pedals, not only to scales, but to chords.

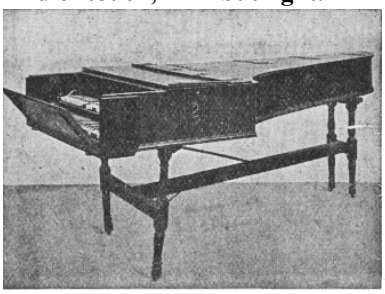




Harp. Left, diagram of strings showing altered positions when playing, left, flat; centre, natural; right, sharp. Above, relative positions of the pedals when the strings are keyed as left. (Courtesy of S. & P. Erard)

The old single action harp in E flat was at one time extremely popular as an instrument for ladies, but the double action harp, which speedily rendered its predecessor obsolete, was never such a favourite with dilettanti. So far as fingering was concerned, however, it was certainly not more difficult. It is rare now to meet with it in the drawing room, though it is still an indispensable member of the orchestra. To those who can afford its purchase as well as the time necessary to overcome its difficulties, the harp offers undeniable attractions, if only by way of change from the piano and the violin.

HARPSICHORD. The harpsichord was never standardised. Some had two keyboards, and stops whereby differences of quality were obtainable. The harpsichord differs radically from the piano in almost every way. The strings are plucked by quills attached to the jacks which rise from below the wires when the keys are depressed, and the action also is entirely different, so that the performer must employ a distinct kind of touch, firm but light.



Harpsichord. English 17th. century instrument in walnut case. It has cut and engraved brass hinges, two key-boards giving a range of five octaves, and four draw stops. It originally stood in the chapel of Ightham Moat, Kent.(By permission of the Director, Victoria & Albert Museum, South Kensington)

The instrument has but a very limited dynamic variety of tone, this deficiency being partially compensated for by the second keyboard and stops spoken of above, the effect of which on any individual instrument must be discovered through experiment. It has no sustained tone whatever, a circumstance which gave rise to the numerous graces and ornaments which are such a feature of 17th century music.

Many old specimens exist in public collections and in private hands; they are more or less delicate in constitution and require to be handled carefully by an expert. Modern harpsichords of more robust character are still manufactured for those who indulge in the cult of old world music played on the kind of instrument for which it was originally composed.

HARRIS TWEED. This cloth is defined by the Harris Tweed Association as tweed hand spun, hand woven, dyed and finished by hand in the islands of Lewis, Harris, Barra, and their several purtenances, and all known as the Outer Hebrides.

In working the wool before spinning it the crofters apply an oil, the effects of which are too penetrating to be entirely removed by any subsequent process; the oil retains the characteristic odour of peat smoke. The tweed is woven mostly with a diagonal twill, which gives it a bulky appearance. Similar cloth, known as kelt, has long been made in the Hebrides from wool dyed with vegetable colours obtained from plants and blended into heather moorland tints.

Harris tweeds are made in rather soft-handling wool not very fine spun or hard twisted and from single-ply yarn. They are about 28 in. wide, and 7 yd. are needed for a man's suit. Being hand-made and finished, they vary from piece to piece of what is nominally the same pattern, and some are heavier and more densely compacted than others. A favourite pattern is the cassimere twill.

The pattern most to be recommended for wear is the herring-bone, or chevron formed by short zig-zag

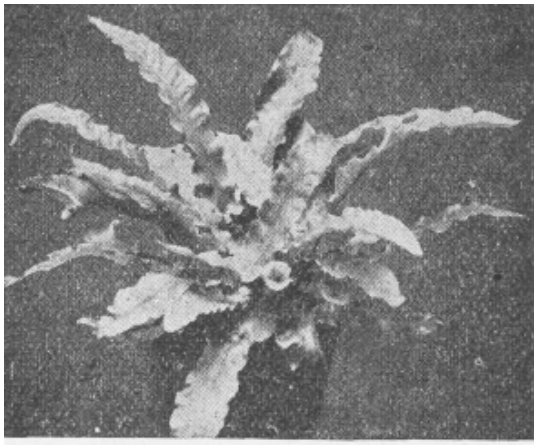
opposed twills.

Harris tweed is especially suitable for shooting, fishing, and golf suits. It makes good overcoats and capes, because it sheds water better than tweeds of some other kinds.

HARSLET. An alternative name for pig's fry, the word harslet is also used to describe a country dish prepared from the whole fry or a mixture of fry and pork. To make the latter, wash the liver and blanch the sweetbreads and pound ¾ lb. pork to make it tender. Season all highly and flavour with a small chopped onion and 6 sage leaves, chopped if fresh, and rubbed through a sieve if dried. The liver and sweetbreads may be cut into slices or minced finely or left whole.

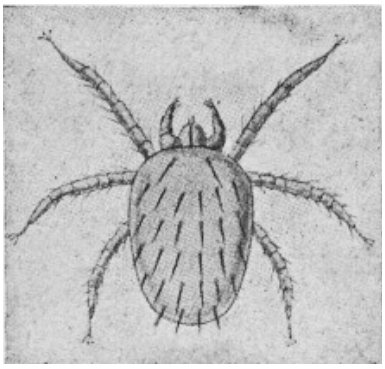
Mix these ingredients together with 3 oz. finely chopped suet, place them in a cleansed bladder and sew up the end securely. The harslet may be either boiled or roasted, but if roasted it should be well basted and served with a rich brown sauce. The cooking must be gentle and will take from an hour to an hour and a half. When the whole of the fry is used, omit the pork, and use 4 oz. suet. *See* Fry.

HART'S TONGUE FERN. There are many pleasing forms of this hardy fern, Scolopendrium vulgare, which will thrive in ordinary soil and prefers a damp shady position. If grown in pots they are useful for the cold greenhouse and window. Among the best named varieties are crispum, cristatum, and laceratum. *See* Fernery.



Hart's Tongue Fern. Hardy fern with undivided fronds, grown as a pot plant for house decoration.

HARVEST BUG. The minute reddish-coloured beetle known as the harvest bug is often present in immense numbers in fields and gardens, especially in chalky districts. It mostly attacks the legs, children being the greatest sufferers. Red pimples or wheals like those of nettlerash appear on the skin, and there is intense itching. As a preventive, eucalyptus ointment rubbed on the legs and feet sometimes is successful. When the insects succeed in attaching themselves, the rubbing in of a weak sulphur ointment will destroy them. On the following morning after applying the sulphur ointment a hot bath with plenty of soap should be taken. The itching and irritation may be relieved by smearing with carbolic acid ointment.



Harvest Bug. Minute beetle, the bites of which produce an itching rash. It is here highly magnified.

HASH: How to Prepare. Beef hash is prepared by melting 1 oz. good dripping in a stewpan, stirring in ½ oz. flour and frying it till brown. Add ½ pint gravy or stock, and stir it over the fire until it boils; then put in a tablespoonful of Worcester sauce, a teaspoonful of made mustard, and, if liked, ½ wine-glassful port wine. Season well with salt and pepper. Cut ½ lb. cooked beef into neat slices, put them in the sauce and heat the hash very gently, without letting it approach boiling point. Serve in a hot dish, garnished with sippets of toast and small heaps of red currant or rowan jelly.

To make mutton hash, cut 1 lb. cold mutton into neat slices, putting the bones and trimmings in a saucepan with ¾ pint water to make stock. Let them cook steadily over a moderate fire, and in the meantime wash and prepare 2 or more carrots and potatoes, scooping them into neat balls with a round vegetable cutter. Boil these until tender in salted water, then peel and slice an onion and a carrot, and fry them in a saucepan containing 2 oz. butter. Sprinkle in 1 oz. flour, fry that also, and then add ½ teaspoonful vinegar, stirring all over the fire for 2 or 3 min. Strain in the stock and continue stirring until it boils. Season the whole carefully, adding a tablespoonful of ketchup; then pour it over the mutton previously placed in a casserole. Put in also the potato and carrot balls, place the casserole in the oven and let the meat heat through very gently. Serve in the casserole. Cold veal or pork may be hashed in much the same way with the addition of a bunch of herbs instead of the ketchup or sauce.

A rabbit makes a good hash when enriched with red-currant jelly and port wine. Cut the flesh from the bones, and season to taste. Put the bones into a saucepan with a pint of water or stock, a slice of ham, a bunch of herbs, an onion, and a little seasoning, and let them simmer for about 1 hour before straining.

Melt a lump of butter about half the size of an egg in a saucepan over the fire, add a heaped tablespoonful of flour, and mix the two smoothly. Pour in the stock, stir the whole until it boils, and then put in the pieces of rabbit and cook it very slowly for 10—20 min. Small forcemeat balls added shortly before it has finished cooking make a good garnish. The port wine and jelly, a wineglassful and a tablespoonful each respectively, can be added before serving. *See* Casserole; Stew.

HASP: How to Fit. The hasp is a hinged fitting passed over a staple and secured by means of a padlock or other fastening. The usual pattern, as fitted to doors of outbuildings, comprises a sheet of metal plate, to which is hinged the clasp, bent to shape from stout iron wire. Stronger patterns are made like a butt hinge from stout wrought iron plate. Those of ornamental shape are more appropriate for the door of a garage or for any prominent position.

For security the hasp and staple should always be fastened from the inside of the door by passing a bolt through from the front, and securing it by a nut at the back of the door. A metal plate or washer is interposed between the nut and the surface of the door. To avoid rusting, the joint should be well oiled when fitted, and lubricated from time to time. *See* Door.

HASSOCK. From a remnant of carpet or felt a hassock or round or oblong footstool can be made at home and stuffed with shavings, the bottom being covered with coarse canvas. A small, semicircular tab of the felt or carpet, lined inconspicuously with a strong material, should be attached to either side to allow of the stool being easily handled. In certain districts of the north of England a hassock is known by the name of buffet.

HASTY PUDDING. To prepare the cheaper variety, boil a pint of milk, salted to taste, in a pan over the fire. Immediately it boils sprinkle in gradually enough flour to make a stiff batter, stirring and beating all the time. Let it boil for a few minutes so that the flour may cook; then put it into a dish with a few lumps of butter, a little grated nutmeg, and, if liked, some sugar. Golden syrup, jam, or any other kind of preserve may accompany this pudding. If a richer pudding is desired, two or three eggs should be added after the flour and milk have been mixed. The batter must be allowed to cool a little first, and must not be brought to the boil again, otherwise the eggs will be certain to curdle.

HAT: Choosing and Wearing. Fashions in women's hats change from season to season, but the well-dressed woman adapts the fashion to suit her own features. If she is tall, with a thin face, she avoids narrow hats with high crowns as these accentuate both height and thinness. She chooses instead the styles that give width, such as the low-crowned "cartwheel" hat, the flat, peaked beret, or any similar style that is in vogue. Also she studies her reflection in a full-length mirror, for only by seeing the combined effect of hat and gown can she avoid an unbalanced or top-heavy look. By using her own candid judgement, she helps designers to bring individuality into hats.

Straws and Felts. Straw hats are mainly manufactured at Luton in Bedfordshire. The kind of plait used depends on fashion, and much millinery straw is imported either ready dyed or natural. Crinoline or tagel plaits are classed as straws, though the former is usually made of artificial silk and the latter of hemp. Pedal straw is largely manufactured in Italy. From Italy also are imported large quantities of straw hoods. A hood is the material of a hat, either straw or felt, formed into an unstiffened, roughly shaped piece, ready for making into the required style. This piece may be woven as in Panama fabric and its imitations, or made of straw plait machined into shape, of felt, or of velours.

Felt hats are made from the fur of rabbits, hares or beavers in the better qualities. Cheap grades are of wool, sometimes finished with a fur veneer. Fur felts are lighter and more pliable than wool felts; also, they retain their gloss owing to the bright hairs of the fur fabric. Although there are brushed wool felts they cannot be said to imitate velours successfully. Real velours is an expensive material, composed chiefly of hare's fur with sometimes a slight mixture of rabbit's fur. Many velours hats are imported, both finished and in the form of hoods, from Czecho-Slovakia, Austria, Germany and Italy.

Hats for Men. The hats chiefly worn by men and boys are stiff and soft felts, straws for summer and silks for evening wear.

The silk hat has a cylindrical crown made from several layers of muslin stiffened with shellac, covered with a silk plush, and sewn so neatly that the seam is invisible. From time to time hat manufacturers make slight alterations in the height and shape of the crown, or size and curl of the brim, so that a wearer should ascertain if his silk hat is of the style in vogue.

The most popular hats are the soft felts and velours, although the stiff black felt or bowler enjoys a very big sale. The cheapest varieties are those made from wool; they lack the finish and wearing capabilities of the fur hats, and are harsher to the touch. Quiet tones of grey, brown and fawn are generally fashionable in soft felts, which can be bought with wide or narrow brims, flat set or curled, bound or unbound.

Velour hats originally were made only from hare's fur. For a cheaper hat rabbit's fur is used extensively, but it is distinctly inferior, and anyone can detect the difference between velours made respectively from hare's and rabbit's fur by the feel. It is not possible to obtain the pile of the real velour made from hare's fur if inferior material is used. The velours is made on the same principle as the soft felt, the pile being obtained by repeated brushings during the stage of manufacture known as planking. Straw boaters are made with a saw or cable edge to the brim, and usually finished with a broad black ribbon.

Practically all hats have a sweat band of leather or other suitable material sewn into the crown, and this is the only part of the hat actually coming in contact with the head. This band should allow perfect adjustment to the head and at the same time permit ventilation.

When buying a stiff felt or silk hat obtain it from an establishment where care is taken in fitting. With a soft felt or velours fitting is a much simpler matter, but it is

well to remember that all felt hats stretch slightly in wear. Hats of all kinds should be frequently brushed, and if possible kept in hat-boxes when not in wear. As a matter of economy it pays to buy a good quality hat, be it velours or soft felt, as it will stand the renovating process, whereas a low quality hat scarcely pays for the trouble. Most hatters undertake the pressing of silk hats and the renovation and re-blocking of others, whether of felt or straw.

The sizes of hats are calculated by their circumference, measured just inside the crown divided by 3-1/7. A ready way of reckoning is to add the length to the breadth, and divide by two. Thus, a hat measuring 8 in. by 6 in. is size 7. The sizes run in eighths, and the usual range of sizes for men is 6½ to 7¼, the middle sizes predominating.

Hats for Children. Children's hats usually conform to their school regulations. Caps of light-weight flannel or tweed in winter and straw hats or basin-shaped felts with pliable brims in summer are worn by boys, while for girls, berets may be of knitted or crocheted wool, and hats of felt, straw or velvet. Trimmings should always be simple.

Hat Bands. On men's hats black bands are most usually worn. In the case of grey and other light-coloured velours or felts a band of the same colour is sometimes worn, but here, too, many persons prefer black. Black bands are also often seen on Panama hats and on straw ones. Many men, however, like to have on a straw hat a band of club or association colours.

With school children, of both sexes, hat bands striped with the school colours and completed by a badge in front are worn. Hat bands can be bought separately from most hatters.

Hat Box. Hat boxes are of two kinds: the large square or oval boxes of stout cardboard in which hats are sent home from hatters and milliners, and the strong fibre or leather ones with handles in which they are carried in travelling.

A travelling hat box, if of fibre, has the merit of lightness over a leather one; but it should be finished with leather corners for greater durability. For women more popular are the round hat bags made of American cloth, with soft lids, and straps which make them easily carried on the arm.

Hat Brush. Silk, felt, cloth, or real velours hats all require the regular use of a brush. A good hat brush, like the clothes brush, is everlasting, being similar in make and quality, but the shape is narrow, and curved to meet the requirement of rounded brims.

To brush silk hats, a soft mixture of bristle and horsehair will not disturb the even surface of the silk, which should then be finished with a plush pad. For all other hats, including ladies' hats, a pure bristle brush is the best, soft substitutes being less durable, and coarse adulteration like fibre may depreciate the quality of the hat. Both single and double brushes are made, the former having well-finished backs of polished satin-wood, walnut, mahogany, etc. *See* Brush; Clothes Brush; Headlining.

HATCH. In one sense a hatch refers to a small gate or door, and especially to the lower part of a divided door. Hatches are put in houses, inserted in the dividing wall between the kitchen and the dining room, in order to facilitate the service of meals. *See* Dining Room; Service Hatch.

HATCHET: Varieties and Use. The hatchet is a small, short-handled axe, adapted to be used with one hand. Several varieties are obtainable, each comprising a steel head or blade and a wooden handle or helve. For household use the Canadian or hunter's hatchet is handy for splitting firewood; the carpenter's or Kent hatchet, slightly different in shape, is used for heavier timber. The shingling hatchet, with its broad cutting edge and short steel poll or hammer head, is useful for cutting timber for rustic work, one part of the head being employed for cutting, and the other for driving nails. Apart from the preparation of firewood, the hatchet is important in the garden for shaping the ends of stakes and light fencing posts.

In use the tool is grasped firmly in the right hand and the wood to be cut is supported in the left, with the end resting upon the ground, but in any case so positioned that the cutting edge of the blade will not be damaged. The method of use is shown in the illustration.



Hatchet. Showing how the tool is held when in use.

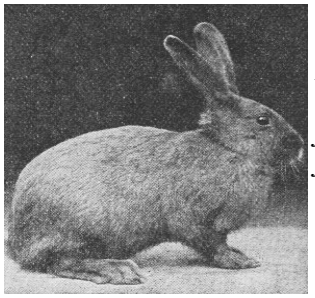
The edge should be kept sharp and free from notches. This may be accomplished by grinding the blade on a grindstone and whetting with a whetstone, using this with a circular rubbing motion. The cutting edge is variously formed according to its purpose. Ordinary varieties are ground uniformly on each side of the face, and the cutting edge becomes central, but on the Kent squaring hatchet the grinding is restricted to one face, bringing the cutting edge to one side of the head, and is thus like the chisel. By this means work can be cut more square than would otherwise be practicable. *See* Adze; Chopper.

HATTER'S PLUSH. Specially made for hat coverings, hatter's plush is a light silk fabric with a laid, glossy pile which can be smoothed down by brushing in one direction. The support of a firm foundation is required to show off the principal feature of the material, which is made principally in black;

brown and other colours are obtainable for millinery. Hats made of this plush need frequent brushing.

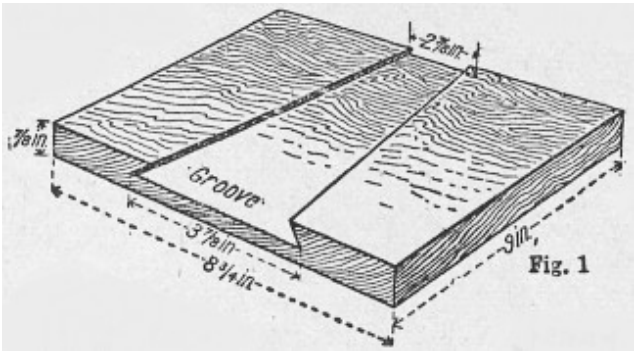
Haunch. The haunch of an animal is the fleshy part of the hip and buttock. *See* Beef; Mutton; Venison.

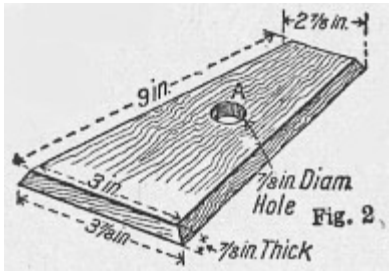
HAVANA RABBIT. The Havana rabbit excels as a flesh producer, weighing, when fully grown, from 5| to 7 lb., and its meat is of first-class quality. It is also bred largely for its fur, which is of a deep rich chocolate colour with a purple sheen. It is very hardy and does well either indoors or in outside hutches. *See* Fur; Rabbit.

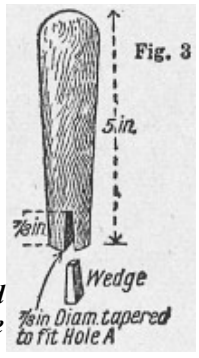


Havana Rabbit. Prize specimen of a rabbit largely bred for its beautiful fine brown fur.

HAWK: For Plastering. The plasterer's hawk is a species of board with a handle projecting vertically downwards from the centre. It is held in the left hand, to support the plaster or mortar when carrying it from the mortar board. The diagrams show its parts, and give the necessary dimensions and details of construction. Although deal is generally used for this tool, a close-grained wood such as birch or beech is preferable, as neither is so liable to warp. Moreover, hardwood will stand rough usage much better than softwood such as deal.







Hawk. Figs. 1-3. Measurements and details for making board, wedge piece and handle.

The board piece, Fig. 1, may be made from 9 in. by 1 in wood, and should be planed up on both surfaces, and on all the edges. A tapered groove, with a V-shaped undercut, is cut across the centre of the underside of the board, this being done with a tenon saw, by cutting the sides or shoulders and then chiselling out the surplus material. Into this groove is fitted a piece of 1 in. hardwood, planed and bevelled, so that it fits firm in the groove. This can be fitted by the aid of a plane, and to ensure proper contact the sides of the groove may be rubbed with blacklead or chalk, the wedge piece inserted, and on its removal the high parts will be indicated by the black-lead.

A perfect fit having been obtained a ⅞ in. diameter hole is drilled into the centre ot the wedge piece, Fig. 2, the hole slightly tapered, and a wooden handle, Fig. 3, prepared to the shape shown in the illustration. It is tapered at the end, slotted to take a hardwood wedge, and the whole glued and wedged into the hole in the tapered piece, any surplus that projects upon its surface being removed with a chisel or plane.



Hawk. The correct way to hold and to use a plasterer's hawk.

The use of the hawk will be apparent from the illustration. The board should always be kept clean and free from hard lumps of plaster or mortar. These are scraped off with a trowel every time the supply of material is replenished and at the end of the job the wedge piece is knocked out of its place and the board washed clean, the wedge replaced, and the hawk stood aside until it is again required. *See* Plaster; Trowel.

HAWKER. English law does not distinguish very clearly between a hawker and a pedlar, although one Act of Parliament defines a hawker as a man who goes about with a vehicle in which to carry the wares he has to sell, and a pedlar as one who goes on foot. In practice, however, there is no difference between the two.

A hawker, therefore, may be defined as one who trades by going from house to house, having with him, either on his person or in a vehicle, the goods he wishes to sell. He may be, too, one who seeks to secure orders for the sale of goods to be delivered immediately, or who offers for sale his skill in any handicraft; for instance, repairing chairs or grinding scissors.

Under an Act of 1871 a hawker or pedlar must take out a licence before he can carry on his trade. These licences can be obtained from the police authorities at a charge of 5s. each. The licence only lasts for a year, and must be renewed at the end of that time. An applicant for a pedlar's licence must be at least 17 years old, and must have resided for at least a month in the district where he makes his application. He must be of good character, and must show that he really intends to trade as a pedlar. If a hawker makes use of a cart

or truck the words "licensed hawker" must be visibly and legibly inscribed upon it.

A hawker's licence is issued by the Inland Revenue Commissioners and expires on March 31 in each year. A certificate of good character must be obtained signed by a clergyman or minister and two householders, or by a justice or superintendent of police. If a hawker acts contrary to the provisions of the law concerning hawking he may he punished hy a fine or by the withdrawal of his licence. The latter takes effect if he is convicted of begging.

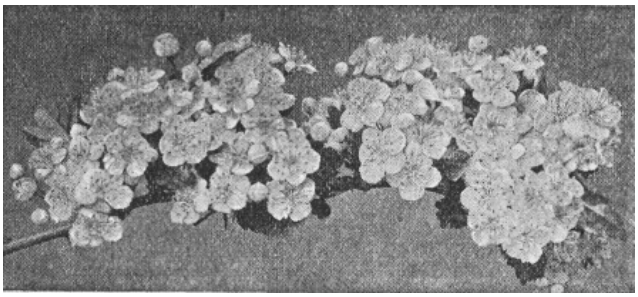
Dealers in certain commodities can sell their wares from door to door without a licence, and so in the eyes of the law are neither hawkers nor pedlars. Such wares include fish, fruit, vegetables, and other victuals. The word "victuals" includes all foods. Coal can also be sold without a licence, while commercial travellers, canvassers, and others who seek orders for clothing, books, etc., are also free. Hawkers, therefore, are chiefly confined to men who sell notepaper, matches buttons, bootlaces, needles, cotton, cheap jewelry, and other articles of that kind. Gipsies form a large proportion of the hawker class, offering for sale baskets and other articles of wicker, as well as lace curtains and various household requisites. Many hawkers, especially in the poorer neighbourhoods, do useful service by catering for legitimate wants, conferring a benefit on the busy housewife by bringing to her door the articles she needs. Others, however, are little more than beggars in disguise. They will offer some worthless article for sale, and when the goods are declined will beg for old clothes or a copper.

Housewives should firmly decline to buy from hawkers goods they do not need, and on no account should allow themselves to be intimidated. If a hawker refuses to go away when told his wares are not wanted the police should be informed.

HAWK MOTH. This is the name of a group of twilight-flying moths, so called because their method of flight is similar to that of the hawk. They cannot be regarded as pests of serious importance in the garden, although one of their number, the death's head hawk moth, is sometimes the cause of damage on the potato plot. This member is not often seen, but may be identified by its large size, black and yellow hind wings, blackish brown marked fore wings, and the curious semblance of a skull upon its thorax. Its caterpillars appear from midsummer to autumn, measure about 5 in. in length, and have fat yellow bodies with violet stripes. No special remedy is necessary beyond destroying the larvae and pupae if they are found when lifting crops.

HAWKWEED. A hardy perennial of the daisy order, the hawkweed (hieracium) is not particular as to soil, but prefers a sunny position on banks or rockeries. The best is aurantiacum, 12 in. high, with orange-coloured flowers, easily grown from seeds.

HAWTHORN. A group of hardy ornamental trees of which the commonest is Crataegus oxyacantha (hawthorn, whitethorn or "may"). There are many varieties of this species, some with double, others with single flowers which are beautiful in May. The variety praecox is the Glastonbury thorn. The whitethorn or quick forms an excellent hedge. Some of the hawthorns introduced from other countries are splendid garden trees, valued for their flowers in May and their ornamental fruits in Autumn. Two of the best are the scarlet haw, coccinea, and the cockspur thorn (crus-galli). The firethorn (Crataegus pyra-cantha) is described under its correct name, Pyracantha.



Hawthorn, Flowering spray of this fragrant wild tree which, under the name of whitethorn or quick, is used for hedge planting.

HAY. Apart from its use as food for cattle, hay is of value for other purposes, both in the house and the garden. In the poultry yard it is common as a nest lining for sitting hens, although its tendency to turn fusty perhaps reduces its value when compared with short, broken straw. Whichever may be used, either for nesting or as litter in house or run, it must not be allowed to get damp or dirty, and the poultry-keeper should scatter hay or straw loosely, so that grain may sink into it, and thus compel the birds to scratch about for food. Hay, especially clover hay, may also be used as a substitute for fresh green food, being steamed for some hours until it swells to something resembling its original state.

The keeper of small livestock should, without trespass, endeavour to secure free hay from lane and hedgerow, gathering clover, grass, and herbage, and exposing them to sun and wind until dry and sweet for use in winter. Cutting is best done when the majority of the grasses are in flower, and should always be completed before seeds begin to ripen, otherwise the stems become tough and dry.

Hay also has its use in the garden, being handy as a mulching medium; stuffed into a small flower-pot as a trap for earwigs, especially those attacking dahlias; or as a substitute for manure in making mild hotbeds for plants such as vegetable marrows. In the latter case it must be very firmly trodden and damped before use. In the home, pillows stuffed with hay are esteemed as a soporific for insomnia, while hay boxes are used for cooking purposes.

HAY BOX: To Use and Make. In using the hay box, if it is intended to cook two dishes at the same

time, the pans must be put in and taken out together, or two separate cushions made so that one pan can be removed without causing loss of heat to the other. Soups, stews, porridge, puddings, etc., may all be cooked by the hay box method. Suet puddings are best cooked in a basin with a screw-down lid, and put into the hay box in a pan of boiling water. For stews prepared in a hay box the meat must be perfectly fresh.

All food must be actually boiling when put into the box, and most will require to be partly cooked in addition. The pan must not be uncovered until it is to be removed, and its contents must be reheated before serving. The main advantage of a hay box is that it effects a great saving in fuel and gas, and needs no attention during the cooking process.

A rough and ready hay box can be prepared at a cost of a shilling, or less. Procure a wood box, say a sugar case, and line it with seven or eight thicknesses of newspaper to keep out all draughts. A useful size, which will allow of two divisions, is about 22 in. by 15 in., and 15 in. or 16 in. deep. A box for only one stew-pan will do at about 14 in. cube. The size depends on the cooking vessel used. At the bottom of the box there should be an allowance of 6 in. for hay, and a minimum of 3 in. of hay at each side. Above the pan it is necessary to allow 4 in. for a cushion filled with hay.

About sixpennyworth of hay will fill the larger-sized box. This should be packed as tightly as possible. Cushions to place above the stewing-pan can be made of linen. These are tightly stuffed with hay, and should be of a size to fit the divisions closely. Any ordinary saucepan can be used, but as beginners find the handles in the way, it is better to commence with either aluminium pans with a small handle on either side (aluminium holds the heat well), or enamel cans with a handle over the top. An ordinary brown stewing-jar will serve equally well. These jars can be bought for a few pence, are cleanly and can be placed over a low gas flame.

The stew-pan, with the food, is brought to the boil over a gas-ring (or a fire) and is then placed in the box. It rests on the hay; hay is all around it, and the hay cushion is put above, being held down either with a weight or with the lid of the box. The water remains practically at boiling point for many hours, and in this way food may be cooked without requiring the usual constant attention. In many cases it may be cooked over-night.

HAY FEVER. This is an acute inflammation of the mucous membrane of the nose, eyes, and air passages. It usually appears in Great Britain between May and August and affects about twice as many men as women.

The cause of hay fever is the pollen of certain grasses and other plants, the pollen containing a poisonous principle. The pollen of rye is particularly rich in this poison. But pollen or any other irritant is capable of producing the affection only in certain susceptible subjects. In some people dandruff from horses or other animals, in others some particular food, and in others still the inhalation of a larger variety of substances, is the exciting cause.

The symptoms are much like those of a severe cold. There is violent sneezing, and a copious watery discharge from the nose and eyes. Itching of the palate and the back of the mouth becomes troublesome, and there is not infrequently a hard, dry cough, and perhaps asthmatic paroxysms with wheezy breathing. The sense of smell may be lost, taste impaired, and hearing more or less affected. The patient suffers from depression and low spirits. There is usually loss of appetite, a feeling of lassitude, and often sleeplessness.

When practicable, a person who suffers much from seasonal hay fever should go to live at the seaside or some mountain resort during the summer. As the specific irritant varies in each case, an effort must be made to find out which is responsible. The patient's own observations may be very helpful in such an investigation. Where it is not possible to ascertain the cause, inoculation with pollen extracts or vaccines may be successful in preventing or mitigating the severity of the attacks.

The general health must be kept up. Locally a simple spray may be used, such as weak boric acid solution, 3 gr. to the oz. of water; a solution of 2 gr. bicarbonate of soda and 2 gr. common salt in 1 oz. of water; a 1 per cent solution of protargol. Very often some defect within the nose favours the occurrence of hay fever. Sufferers should therefore be examined by a surgeon. *See* Asthma.

HAZARD: A Card Game. This is a game for four players, two being partners against the other two. The pack consists of 25 cards, all the cards below the nine in an ordinary pack being thrown out, and the joker added for the 25th card. Players cut for partners, the two lowest playing against the two highest, aces counting high in cutting. The player cutting the lowest card deals.

The joker is the best trump, then the jack of the trump suit, then the jack of the same colour, and then the ace, king, queen, ten, and nine. The cards of suits not of the same colour as trumps rank ace, king, queen, jack, ten and nine.

Six cards are dealt each player three at a time. The last card is placed by the dealer on the table face downward, and must not be looked at till the game is over. Eldest hand has first bid, and he names or hazards the number of the tricks he thinks he can make, without, however, naming any suit as trumps. Each player in turn either passes or bids higher, the highest bidder naming trumps and leading the first trick. Each trick counts one point, and for each trick he fails to make on his bid the player is set back a point. Ten points constitute game.

In the double-pack game, two, three, four or six players may take part. The pack consists of a double pack of ordinary cards from which all cards below the nine have been removed. The joker is not used in the double-pack game. If duplicate cards are played on a trick the first one played takes the trick. With two or

three persons playing, each plays for himself, with four, two against two, and with six, three against three. Four cards at a time are dealt. The lowest bid allowed is six tricks. If a bidder thinks he can win all tricks he may name the trumps and discard two of his own cards, asking his partner for his two best cards. The bidder then plays a lone hand.

If the game is four-handed his side scores 24 if he succeeds, and is set back 12 points if he fails. In a six-handed game his side scores 26 for the win or is set back 8 points. Normally each trick counts 1 point, and 62 points constitute game.

HAZEL. The hazel is a native British tree that grows plentifully in the home counties. The timber, which is a reddish white in colour, soft and highly elastic, is not sufficiently durable for good cabinet making, but it is employed for crates, barrels, and fencing stakes. Charcoal is also made from it, and the water diviner uses a hazel twig.

Hazel Nut. The hazel nut is the fruit of the hardy shrub Corylus avellana, which flourishes in ordinary soil. The golden-leaved variety, aurea, is ornamental. The purple-leaved variety of another hazel, Corylus maxima, is also showy. Propagation is by setting the nuts in autumn out of doors or by layering in summer.



Hazel Nut. Fruit and leaves of a decorative tree which can be trained to form a garden hedge.

HE. This name is sometimes given to the popular children's game known also as touch, tag, or tick. *See* Touch.

HEADACHE: Its Treatment. An occasional headache is due generally to some purely temporary cause such as overwork or stomach disorder, but if it is persistent medical advice should be sought, as more serious troubles may be involved. In children especially a headache requires attention. Women always suffer more than men and very often do harm to themselves by the excessive use of drugs which produce temporary relief.

Eye strain, decayed teeth, adenoids, ear trouble and disease in the nose are all possible sources to be considered. Headaches due to eye strain are common in children. The eyes should be examined by a reputable oculist, and suitable glasses provided. The commonest causes of the condition in women are constipation, neurasthenia, and anaemia. In men, overwork, work done at high pressure, and particularly when distracted by noise or poisoned by bad air, excessive smoking and drinking, with its usual consequence, catarrhal dyspepsia, are very common causes. Heavy indigestible meals, drinking strong tea or coffee, wearing too close-fitting hats, sleeping in ill-ventilated bedrooms, sleeping too long, using heavy impervious bedclothes, any kind of mental strain, may, any of them, give rise to troublesome headaches.

Where disorders of the stomach are at the root of the trouble the pain is felt towards the front of the skull and equally on both sides. The pain of the anaemic headache is most severe on the top or at the back of the head. The congestive form, in which the brain is overloaded with blood, is accompanied usually by throbbing in the head and a flushed face. Alcohol and strong tea or coffee should be avoided. Aperients such as 5 grains of blue pill may be taken twice a week at bed-time, and the diet should be light and digestible. To relieve an attack, put the patient's feet and legs in a hot mustard bath, bathe the forehead with ice-cold water or put an ice-bag to the head. The safest remedy for a nervous headache is to rest in a darkened room.

Certain drugs are much used, to the great injury of the patients. The doctor should be asked to prescribe, as harm may result from frequent resort to headache powders.

HEADER: In Brickwork. The word header is used to describe a brick that is set horizontally with its greatest length at right angles to the face of the wall. The proper arrangement of bricks, and the relative placing of headers across the wall and bricks laid in the same direction as that of the wall and called stretchers, is known as bond, or bonding. A header course is a row of bricks set at right angles to the face of the wall. *See* Bond; Bricklaying.

HEAD-LINING. Material shaped to fit the inside of a hat is called the head-lining. Such things are usually of silk and are quite simple to make, but a correct fit is important as they wear or tear quickly if too tight, besides being uncomfortable on the head.

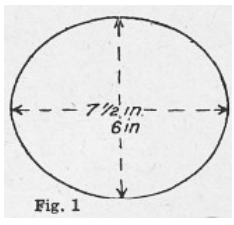


Fig. 1

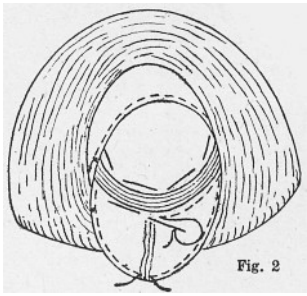


Fig. 2

Head-lining. Fig. 1. Measurements for the crown lining. Fig. 2 shows a simple method of attaching the lining to the hat.

A strip of material, cut on the cross or straight as desired, measuring 23½ in. or 24 in. long and about 6½ in. wide, must be cut, and an oval-shaped piece, as shown in Fig. 1, is necessary to line the top of the crown. Place the oval piece into the crown, catching it through with long stitches to the outer part (Fig 2). Pin the straight piece round the inner edge of the brim so

that it fits exactly. Leave ½ in. for turning at the ends, which must be joined up. Run a slot, ¼ in. wide, along the outer edge, leaving eyelet openings on each side of the join so that a China ribbon may be threaded through; this enables the lining to be drawn up to fit the head. Should the hat be of a soft material the head-lining may very easily be sewn in as shown in Fig. 2, leaving a good ½ in. margin in case the material should fray; but if the hat is straw, the needle should be pushed right through to the outer side, making very tiny stitches on the outside and long ones, inside which will not show when the lining is turned over them.

HEALTH: Its Essentials. Speaking broadly, health consists in all the organs and parts of the body performing their functions quite comfortably and with such vigour as to allow of our doing the day's work, including reasonable strain, without undue fatigue.

In addition to the sudden and great danger from infectious diseases and physical injuries, health may be undermined by personal habits which are hygienically wrong. Amongst the many things essential to bodily and mental welfare, there are three which are too frequently inadequate, viz. fresh air, exercise, and sleep.

Lack of exercise is usually associated with a lack of fresh air, and the results may be rickets in young children, anaemia, constipation, a sluggish digestion, and an inelasticity of mind and spirits, partly due to the bodily state and again reacting upon it. Late hours, especially when too many of them are filled with feverish excitement, are also undermining factors, and as life becomes more strenuous a sufficiency of sleep becomes all the more necessary.

Much ill health is due to want of knowledge and judgement in the use of food. It is now recognized that vitamins play an essential part in nutrition and that the foods containing these, such as fresh milk, butter, meat fat, eggs and fresh vegetables, cannot be neglected with impunity. Almost as important for our nutrition is the possession of sufficient teeth and proper habits of eating and drinking. The abuse of alcohol, tea, tobacco, and other drugs are dangers to be avoided.

It has been noted that most people who live an unusually long span of years have been characterized by cheerfulness of disposition. *See* Breathing Exercises; Diet; Drill; Exercise; Insurance; Ventilation; etc.

HEARING. When anyone finds his sense of hearing becoming in the least defective, he should at once consult a doctor. There are some affections of the ear which can be cured when treated at an early stage, but which, if neglected, may result in complete loss of hearing. The ear is one of the most delicate and complicated of our organs, and when affected in any way it is imprudent to practise self-treatment. *See* Deafness; Ear.

HEART: Structure and Disease. The main organ of the circulatory system is the heart, which is divided into four chambers, the two upper ones being termed auricles and the two lower ones ventricles. The two great veins, through which passes all the blood returning from the body, open into the right auricle. From this chamber the blood flows into the right ventricle and passes along the pulmonary artery into the lungs. Having been recharged with oxygen in the lungs, the blood is carried into the left auricle, then to the left ventricle and, passing into the aorta, is then distributed to the body. The heart being a group of four pumps, each of which is emptied in the same way as is a rubber bulb when it is squeezed, valves exist at the openings to maintain the flow in one direction. The sounds audible when the heart beats are made chiefly by the closing of these valves. The average number of beats per minute in an adult is 72.

Diseases of the Heart. The great majority are valvular diseases, and these are of two main kinds, stenosis, or narrowing of the valve, which obstructs the blood flow, and incompetence through leaking of a valve. In the treatment of valvular disease the main objects are to lessen the work of the heart by removing resistance and avoiding strain as far as possible, to strengthen the heart itself and to relieve distressing symptoms when they appear in the later stages. Valvular diseases may, for this purpose, be divided into two main classes, those in which compensation is maintained and those in which it is failing or has failed. In the former the patient will suffer no great discomfort unless he overworks his heart.

A boy or girl suffering from valvular disease cannot safely join in violent games such as football. The clothing should be warm, the diet nutritious, and everything indigestible should be strictly avoided. At school study should not be carried to the point of mental exhaustion, and excitement must be avoided. With adults similar precautions should be taken. Slight ailments such as colds, bronchitis, etc. must be taken more seriously than in people with healthy hearts. It is of great importance that the mouth be kept clean, carious teeth being removed, and pyorrhoea dealt with energetically; the same applies to sepsis anywhere.

Functional or nervous disorders are very common, and are frequently referred to as D.A.H., or disordered action of the heart. They are not due to organic disease, but to some outside influence acting usually through the nerves. Thus excessive use of tobacco, tea, or other drugs, as well as hysteria, neurasthenia and dyspepsia, may give rise to irregular heart action. The condition may follow acute disorders such as influenza, rheumatism, trench fever, malaria, etc. A septic mouth or sepsis elsewhere in the body may also cause the symptoms, or these may be due to anaemia. The treatment of D.A.H. will vary to a large extent with the cause.

Angina pectoris is a disease due to morbid changes of the heart muscle, and is generally characterized by agonizing paroxysms under the breast-bone, accompanied by a feeling of suffocation. No person who has suffered from angina should ever be without the small glass phials of amyl nitrite (two to five

minims each), which any chemist can supply. At the first sign of an attack he should break one of these phials in his handkerchief and inhale the fumes. The doctor should be summoned at once, and meanwhile a hot-water bottle may be placed over the heart and sips of hot water and brandy should be given. After an attack the greatest care must be taken to avoid physical and mental strain.

Like any other muscle, the heart may be weak without being actually diseased. It then gives rise to distressing symptoms and often causes needless alarm. Tobacco smoking, drinking strong tea, and other habits may cause weakness of the heart, which is always curable by removing the cause. After an attack of influenza or any of the infectious fevers the heart may be weak for some time, but this passes away as the patient grows well and strong. It sometimes occurs that the heart becomes weak in middle-aged people, solely because they eat and drink too much and do not take sufficient exercise.

HEART: In Cookery. The heart of a bullock, calf or sheep makes a savoury dish if properly flavoured and roasted. Two or three sheep's hearts are generally required. Wash them in several waters, warm for preference, removing any clots of blood remaining in the cavities. Cut off the lobes, remove any cartilage or gristle and separate the cavities inside the heart. Then stuff it with a well-flavoured forcemeat, skewer or stitch up the opening, and tie greased paper over it.

Roast or bake the heart in a tin with plenty of dripping, and baste it well, but do not let it cook too quickly or the flesh will be hard. As soon as the stuffing is set remove the paper so that the surface of the heart may brown evenly, and turn it over in the tin from time to time. Serve it with brown gravy, to which should be added the sediment left in the tin after the fat has been poured off. Remove skewers or thread.

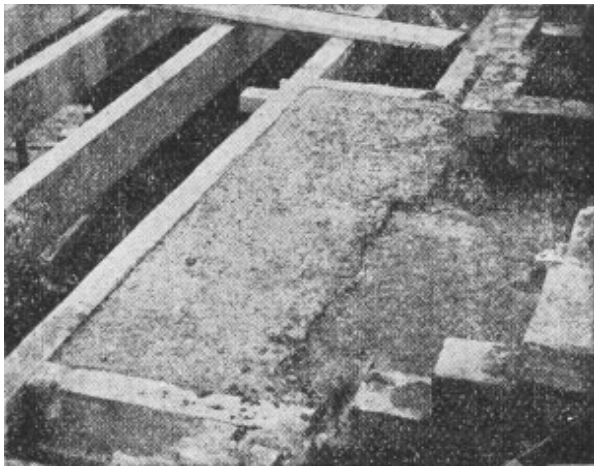
A bullock's heart takes from 2½ to 3 hours to roast, a sheep's heart about 1 hour, and a calf's heart 1½ to 2 hours. *See* Forcemeat.

HEARTBURN. A burning sensation in the gullet and stomach behind the lower end of the breast bone is known as heartburn, but it is in no way connected with the heart. It results usually from the presence of excessive quantities of acid in the stomach. When some of this is forced up the gullet it causes a scalding sensation in the throat.

Relief can usually be obtained by using one of the following remedies, but none of these remove the cause, to which appropriate treatment should be directed. Perhaps the best remedy is a powder of menthol, 1/6 gr., carbonate of magnesia, 10 gr., and bicarbonate of soda, 12 gr., taken in ½ tumbler of hot water. Another useful remedy is a powder composed of 10 gr. subnitrate of bismuth and 10 gr. of the compound tragacanth powder, three times a day. One or two sodamint tablets ½ hour after meals often give relief. *See* Gastritis; Indigestion.

HEARTH: Its Construction. Literally the hearth is the fireproof flooring immediately in front of the fireplace, of which it is a part, and various forms of decorative treatment are applied to it. On the ground floor level, if the floor is solid, the hearth may be built up with concrete, covered with tiles, stones, or brickwork, but is mostly constructed of one material.

In most small houses the ground floor is built up of timbers, and to protect this woodwork a little wall of bricks is built around the fireplace opening, filled with rubble, and concreted to a level surface. This terminates about 1 in. below the floor, so that when faced with tiles the hearth will be level with the floor.



Hearth. Construction of a hearth on an upper floor, showing how the trimmers are arranged to furnish the necessary support.

In a cheap construction, the hearth may be floated off with granolithic concrete and worked to a smooth, trowelled surface.

On an upper floor the floor joists are trimmed to form a framework about 2 ft. away from the fireplace opening and extending to the sides of the chimney breasts, or to the width of the mantelpiece. A fillet of wood is nailed round on the inside of this framework, near to the bottom of the joists, and the aperture temporarily closed by rough boarding supported on props to the ground floor. The box-like structure thus formed is filled with concrete strengthened by reinforcing bars of iron about ¾ in. in diameter, disposed according to the structure of the building. The concrete is then allowed to set thoroughly hard, and finally the wooden props are removed. The surface of the concrete is left about 1 in. below floor level, floated over with granolithic concrete, and trowelled to a smooth surface, tiled or otherwise finished.

When it becomes worn or cracked a concrete hearth may be repaired by chipping off the surface and floating off with new concrete composed of one part of Portland cement and one part of fine granite chips.

To clean a hearth, remove the cinders with a shovel and brush up the ashes that remain with a hearth brush. If it is tiled, wash it with warm, soapy water; then rinse and dry it, and finally polish with a soft cloth or chamois leather. Stone hearths should be washed with warm, soapy water and then rubbed with

hearthstone. *See* Chimney Piece; Concrete; Fireplace; Floor; Grate, etc.

Hearth Brush. Brushes of this kind are employed to sweep up the ashes from the hearth and to remove the soot and dust from the back of the grate. They have handles which are usually made of brass or of oxidized metal to match the fire irons.

A neat type of hearth brush is fitted with a cylindrical brass case which slides up and down the handle according to the position in which the brush is held. When the latter is hung up, the case slips to the bottom of the handle and so acts as a covering for the brush. Hearth brushes are sometimes included in sets of fire irons which hang on small stands and are conveniently placed beside the fire. *See* Fire Irons; Grate.

Hearth Cloth. Employed to protect that portion of a carpet surrounding the fireplace when the latter is being cleaned, a hearth cloth can be made of any coarse material such as sacking, felt, etc. While the cleaning is being done, the fire irons, sticks, and cleaning materials may be placed on the cloth. Care must be taken in laying the latter that the clean side is always placed underneath.

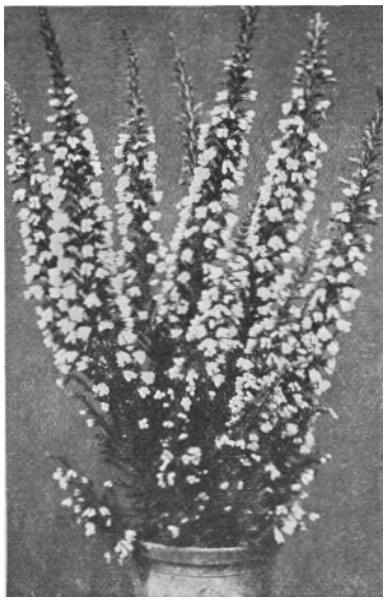
Hearth Stone. This is a preparation sold in block form for cleaning stone hearths, steps etc. It is made by mixing equal parts of whiting and plaster of Paris with enough water to turn them into a stiff dough-like mixture. The latter is then placed in moulds to set.

Hearth Rug. *See* Rug.

HEARTSEASE. This lovely old-fashioned flower may be treated as an annual, biennial, or perennial. It may be raised from seed sown in July in light, leafy soil, in pots or pans, and placed in a cool spot. It may also be increased by cuttings or by layers. *See* Pansy.

HEATH. The botanical name of heath or heather is erica, a genus which contains many beautiful hardy flowering and greenhouse plants. By planting a collection of hardy heaths it is possible to ensure flowers almost all the year round. They prefer peaty or leafy soil but will flourish in lime-free ground to which mould has been added freely: they do not thrive in limestone soil. Planting is best done in early autumn. Cuttings placed in pots of sandy peat in a frame in August provide the best means of propagation. The only pruning needed is to cut off faded flowers, but the tips of young plants should be pinched off to make them branch out.

These are the best hardy heaths for general cultivation—carnea, reddish, spring; darleyensis (mediterranea hybrida), rose red, November-May; maweana, red, August-September; cinerea, the common hillside heather, purplish, September; vagans, the Cornish heath, pinkish, August-September. Arborea and lusitanica, the so-called tree heaths, grow 5 feet or more high, bear white flowers in spring and need a sheltered place.



Heath. Greenhouse variety bearing spikes of white flowers in great profusion.

For cultivation in the greenhouse the following are some of the most attractive heaths: caffra, white; Cavendishiana, yellow; gracilis, reddish; hyemalis, red and white; and melan-thera, white. They must be potted in well-drained sandy peat and grown in a tempe-rature of about 50 degrees. After flowering the shoots should be cut back lightly. Heaths in pots must be watered very carefully; the object should be to keep the soil uniformly moist. If it becomes sodden or is allowed to get dry the plants will fail. In summer they should be placed out of doors or in a cold frame.



Heather. Flower sprigs of the summer moorland plant.

HEATHER. This name is usually given to Erica cinerea, which covers large tracts of country in various parts of the British Isles and is very beautiful when in bloom in September.

HEATHER MIXTURE. Cloths, usually tweed, in colours closely resembling the heather of the moors, and known as heather mixtures, are employed in the making of sports and other outdoor costumes and hats. Stocking wools in heather mixture are made by blending in differing proportions wools which have been dyed brown, red, green, and purple. *See* Tweed.

HEATING: Some General Directions. In this work the various methods of heating a house are described in such primary articles as Central Heating, Electricity, Gas, and Oil. Reference should be made also to Anthracite, Coal, Coke, Fireplace, Grate and Stove.

An open fire radiates heat from the incandescent coals, coke or logs used as fuel. The heat travels out in rays from the glowing surface, heating only the solid bodies upon which the rays impinge, and passing through the intervening atmosphere. Such heat is analogous to that given off by the sun. Modern well designed gas fires furnish most of their heat by radiation, and in electric fires the same end is aimed at, the fireclay back plate being shaped so as to reflect into the room the heat emitted by the glowing element.

Here it may be pointed out that the term "radiator," used loosely for tubular warming appliances heated by steam or hot water, is not a good one, as these function mainly by convection, not radiation. It is true that the casing radiates heat, but owing to its shape only a comparatively small portion of its surface area can effectively send out heat waves into the apartment. A steam or water-heated appliance, or an air warmer, of the electric type illustrated on page 703, heats the air in contact with its walls or casing. This heated air expands and rises, giving place to colder air, which in turn becomes warmed, so setting up a circulation of heated air in the apartment. This is warming by convection.

Another type of convection heater is the cylindrical slow combustion stove. The fireclay lined iron walls become heated and thus warm the surrounding air. Disadvantages of convection heating are that the air in an apartment may become stuffy, and the air currents set up tend to cause draughts. There are difficulties also in suitably ventilating the room without unduly cooling it.

Radiated heat, on the contrary, passes through the air in rays (i.e. straight lines), and after impinging on walls, furniture and other solid bodies, is partly absorbed and partly reflected. It does not warm the intervening air to any great extent, although air in contact with the walls, etc., which have absorbed radiant heat, gradually becomes heated by convection.

An apartment warmed mainly by radiation is generally more comfortable than one in which a convection system is employed. The contrast can be realized by comparing the enervating heat of a Turkish bath, provided entirely by convection, with the bracing warmth of sunshine (radiant heat) on a day when there is a slight but cool breeze blowing.

If it is desired to heat uniformly throughout, particularly if a constant hot-water supply is to be maintained, the merits of central heating should be considered. The economy of labour and fuel effected by this method is considerable, and the atmosphere of the house is kept at a uniform temperature throughout. On the other hand, central heating exhibits a total lack of those cheerful qualities associated with the open coal or log fire. The chief objection to open fires is that they cause a certain amount of extra housework as well as smoke and dirt; but these factors have been reduced practically to a minimum by the modern forms of slow combustion grates.

Those who, while insisting on the cheerful effect and other qualities of the open fire, dislike the extra labour and absence of scrupulous cleanliness associated with coal and other solid fuels, should investigate the claims of the gas fire and the electric fire. If neither of these is available, there remains the oil stove; it is seldom realized what strides have been made in the design of heating apparatus for consuming oil.

HEAT STROKE. Exposure to excessive heat may cause heat stroke, a condition having some resemblance to an apoplectic seizure. When following exposure to the rays of the sun the condition is described as sunstroke, or insolation, but exposure to the sun is not the only way in which heat stroke may be caused, it may occur in stokers and others similarly placed. Its occurrence is favoured by alcoholic habits, inability to sweat freely, and by too heavy clothing.

The patient may suddenly fall unconscious, or there may be preliminary symptoms, such as headache, giddiness, vomiting, and sickness. Usually the face is flushed, the pulse bounding, and if the temperature is taken it will be found to be very high, perhaps 107° to 110° F.

The immediate treatment for heat stroke is to take the patient into the shade, or the coolest place available, strip the clothing from the trunk and souse the trunk and head with cold water. As soon as possible he should be taken home or to a hospital, where an effort will be made to lower the temperature by rubbing him over with ice or giving an iced pack or bath, and possibly an iced enema. *See* Fever.

HEDGE. Certain leaf-losing and evergreen shrubs are suitable for planting as hedges. Among the former are privet, whitethorn or quick, beech, hornbeam and myrobalan plum.

Beech makes a first rate boundary hedge, for the dead leaves remain on the branches most of the winter. Planting may be done at any time from November to March, though early autumn planting is to be preferred. A useful hedge results from planting a double row, the plants in one row alternating with those in the other and being set at 12-15 inches apart. Thorough soil preparation is essential to ensure satisfactory growth. In the spring following planting the shrubs ought to be cut back to within 8 or 10 in. of the base to make them branch out. In future years it is wise to keep the top narrower than the base. Clipping is usually done in spring and early autumn. Privet requires to be cut frequently to keep the hedge neat.

Holly and yew are the best evergreen hedge shrubs, but they grow rather slowly. Plants not more than 2-3 ft. high become established most quickly and surely. May and September are the best times to plant evergreen hedges. Clipping should be done in April and August. The plants may he set 15 in. apart in a single row, or if necessary in a double row. A comparatively new hedge shrub that is strongly to be recommended is an evergreen honeysuckle named Lonicera nitida: it bears clipping well, and can be kept low or allowed to reach a height of 6 ft. Cupressus lawsoniana, Cupressus macrocarpa, common

laurel, Portugal laurel, and thuya (arbor vitae), are other evergreen hedge shrubs, and box may be planted though it grows slowly. Cupressus macrocarpa makes quick progress and soon forms a tall hedge.



Hedge. Cut yew hedge, a feature of great beauty in the formal type of garden. Above, evergreen hedges which make an effective background to flower borders.

Escallonia macrantha, tamarisk and hardy fuchsia, make splendid hedges in mild districts, especially those near the sea. Berberis Darwinii, and Berberis stenophylla, two flowering evergreen shrubs, make attractive informal hedges , so do the Penzance briars and other vigorous roses. The best dwarf hedge is provided by lavender.

The Legal Aspect. The ownership of a hedge is frequently a matter of dispute, but in strict law where a hedge separates two fields it belongs to the owner of the field on whose side there is no ditch. Where there is no ditch on either side, the ownership of the hedge is established by evidence of acts of ownership, e.g. where one owner's family has tended it throughout a long period.

A hedge which has a ditch on both sides is the property of the owners on each side, who are equally responsible for its upkeep. A person must not cut a hedge or any portion of it that does not belong to him.

Hedges in town and suburban gardens should be kept well pruned. Failure to do so may lead to a passer-by being injured bj straggling branches and to consequent liability for damages. Where a garden adjoins pasture land care must be taken that the trees or shrubs forming the hedge are not of a noxious nature. Yew trees, for example, should never be planted under these circumstances, as cattle may eat the leaves, with injurious and perhaps fatal consequences, and the owner of the hedge may be held liable.

A tenant is not permitted to grow a hedge that will damage the landlord's property, as for example, too near a window-sill, blocking out light from a window, or allowing its roots to develop so as to cause settlement, and so on. Overhanging leaves and branches of a hedge in a neighbour's property may be lopped by the person whose land they overhang, though it is usual first to request the owner to cut them. On the other hand, fruit growing on branches overhanging a neighbouring garden is the property of the owner of the hedge. *See* Box; Concrete; Fence; Garden; Holly; Privet; Yew.

HEDGEHOG. There is no pet that is less trouble to keep than a hedgehog. Housewives who are troubled with black beetles or cockroaches in the kitchen will find in the hedgehog a valuable ally, for he will effect a speedy clearance. Young hedgehogs can be bought at bird and animal shops.

HEDGEHOG CACTUS. Most kinds of echinocactus require cultivation in warm and dry greenhouses, but one species, Simpsoni, can be grown in a sunny position out of doors in gravelly or sandy soil if protected from rain in winter. Propagation is by cuttings or offsets taken with a sharp knife and placed in a sunny spot until cuts heal and root growth begins. At this stage they may be potted in a mixture of fibrous loam, finely broken lime-rubble, and sand.

HEDGEHOG CAKE. A hedgehog cake is so called because of its shape and the number of browned and halved almonds used to decorate it. The ingredients and method of making are the same as those described for almond cake, but a more rounded appearance is given. When cooked, the cake is coated with almond paste, brushed over with a little yolk of egg, and placed in a hot oven till of a golden brown colour. The almonds are then stuck into the paste to suggest hedgehog spines.

HEDGING TOOL. This is a tool adapted for cutting hedges, and especially for hedges of considerable size and not easily trimmed with an ordinary hedging knife or bagging hook. The tool comprises a long handle, or shaft, 3 ft. or more in length, and has a steel blade fixed to the end, shaped in much the same form as a billhook. *See* Billhook.

HEEL BALL. A composition of tallow, or beeswax, and carnauba wax, coloured with drop black, is employed under the name of heel ball in the repair of boots and shoes, for colouring and polishing purposes.

It is also used for taking impressions of coins, brasses, and other incised decorations. This is done by placing a piece of white paper over the object, and rubbing upon the surface with a lump of heel ball, with the result that the high parts of the design are reproduced in black, and the incised lines appear on the paper in the form of white spaces. *See* Boot Repairing.

HEIRLOOM. This word is used for articles, e.g. plate, furniture and pictures, which go with a settled estate. Since 1925, these may be settled in the same way as land so as to make it difficult, if not impossible, to dispose of them apart from the land to which they are attached. More generally the term is employed in order to denote articles of value which have been for some time in possession of the same family.

HELENIUM. Hardy perennials which are of great value in the flower border in summer and autumn. They flourish in ordinary soil, are easily propagated by division in spring and autumn and bear large daisy-like flowers. The best kinds are Crimson Beauty, 2 ft., July, crimson-brown; pumilum magnificum, 2½ ft., July, golden yellow; Riverton Gem, 4 ft., Aug.-Sept., reddish; and Moerheim Beauty, 3 ft. crimson.



Helenium. The daisy-like flowers make effective indoor decoration.

HELIANTHEMUM. The name belongs to a pretty family of dwarf flowering plants, popularly known as the sun roses. The flowers of different varieties are white, yellow, pink and crimson in colour, and the plants average about 12 in. in height. Sun roses are useful for the rock garden; they thrive best in light soil. They are raised from seed in spring. The common kind is helianthemum vulgare, of which there are numerous varieties, some with single, others with double flowers, in many showy colours.

Helianthus. This is the botanical name of the sunflower (q.v.).

Helical Gear. *See* Gear.



Heliopsis. Flower head and leaves of a single form of the scabra variety.

HELIOPSIS. Of the small genus of hardy herbaceous plants known as heliopsis and sometimes as orange sun-flowers, which they much resemble, only laevis and its varieties pitcheriana and scabra are much grown. These are showy plants with rough, toothed leaves and large yellow flowers in summer; height 4 to 5 ft. The method of propagation is either by seed or by division of the root-stock in autumn or spring.

Heliotrope. *See* Cherry Pie.

HELLEBORE. This group of hardy plants contains the Christmas rose (Helleborus niger) and the Lenten rose (Helleborus orientalis), which are valuable winter and spring flowers. They flourish in partially shady places in deeply dug and manured soil which does not dry out in summer. The best time to plant or transplant is in July. Small pieces become established quicker than large ones.

There are some beautiful varieties both of the Christmas and the Lenten rose. The finest Christmas rose is one named altifolius (maximus), which bears large white flowers. Of the Lenten roses some of the most beautiful are Isolde, pale rose; Faerie Queen, blush marked with crimson; Snowdrift, white; and Robert Froebel, crimson. Propagation is most easily effected by division of the clumps in summer.

HEM: How to Make. A hem is made by folding over an edge of material on to the wrong side to any required depth, its extreme edges turned in and prevented from fraying by being sewn down to the outer part. The line of sewing should hardly show through on to the right side, if the stitches are small and evenly made. Hems which are made to neaten the raw edges in lingerie, or in sewing very fine silk, should be as tiny and flat as possible, while hems to answer the same purpose in heavier materials are usually made ¼ in. wide so that they can be pressed down flat.

The depth of a hem varies according to the demands made upon it, and the material. A very deep hem several inches wide is often used to give weight, helping to make the part of the garment upon which it is placed hang evenly and well. If the material is too heavy to be turned up to any depth, or if not enough material has been allowed to make a deep hem, 1 in. or more may be turned up and a facing or false hem made with some lighter-weight material of the same shade, to give the appearance of a deep hem.

The edges of a hem made in very thick material should not be turned in, but one edge of a Paris binding should be sewn well over the part which is likely to fray, the outer edge of the binding being firmly hemmed down to the outer part of the garment. The hem will then press quite flat with no unnecessary thickness. In turning up the hem of an unlined coat the edges are usually bound by a crossway strip of material or binding before hemming to the outer part. The hem of a lined garment is kept in place by the lining, and is not sewn down to the outer part at all. Hems made in cloth which is not likely to fray are sometimes turned up and herring-bone stitched flat.

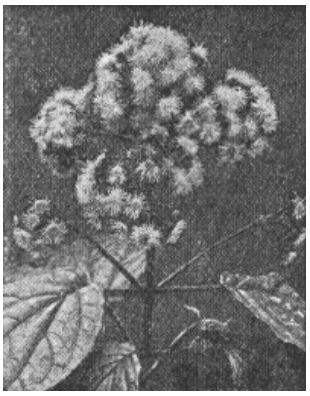
To hem the material, which is done from right to left, hold the hem over the forefinger of the left hand and under the middle finger, holding it down with the left

thumb, and keeping the inner fold towards you; then, pointing the needle outwards, pick up a few threads of the material just below the inner fold and push the needle up through the edge of the fold itself. Draw the needle through, and repeat. All the stitches should be made uniform in size, slant and space. If the material is not too thin, the needle can be passed through the upper surface of the fabric, so that practically nothing is seen from the right side.

HEMLOCK: The Drug. Both the fruit and the leaves of the hemlock, or conium, are used in medicine, but the drug and its preparations are not officially recognized by the medical authorities. The drug is rarely prescribed to be taken internally, as its action is uncertain. Conium ointment has been found of much use as a cure for itching and fissures about the anus.

The chief symptoms in hemlock poisoning are heaviness in the legs, staggering gait, and finally complete loss of power over the muscles. The eyes become fixed, the pupils dilate, the breathing becomes more and more difficult, until finally death ensues from asphyxia. After an overdose of hemlock an emetic should be given at once, and then strong warm tea freely. The patient should be kept warm with hot-water bottles and blankets. If the heart flags, or breathing becomes very laboured, stimulants should be given and artificial respiration should be carried out. *See* Emetic.

HEMP AGRIMONY. This is a hardy perennial suitable more particularly for a large garden, owing to its coarse growth. There is one species, however, which may be recommended for smaller gardens, namely, Eupatorium ageratoides. This makes a fairly compact bush about 3 ft in height bearing pure white flowers and requiring a sunny position in ordinary soil. Propagation is by division of roots in spring or autumn, or by seeds sown outdoors during April.



Hemp Agrimony (Eupatorium) which bears large heads of white flowers in late summer.

HEMSTITCH. This is used chiefly on house-linen, when it actually holds down the hem, but it is employed also on dresses and lingerie.

On a teacloth a hem is turned, usually about 2 in. wide, tacked down, and several threads drawn just under the edge of the hem; the number of threads to be drawn depends on the texture of the linen or other material in use for the cloth. The stitch then proceeds as in drawn thread (q.v.)

HENBANE. This is the popular name for hyoscyamus. It grows wild, especially on and around heaps of old rubbish, but in some places it is cultivated because of its use medicinally. Every part of the plant is poisonous, particularly the root, which is often mistaken for chicory or parsnip. The leaves are oval, lobed or toothed, the upper ones clasping the stem. The flowers are large, shaped like a funnel, and in colour a dull yellow veined with purple. The fruit is a many-sided capsule with a distinct lid. The whole plant has a somewhat unpleasant smell.

The leaves and flowering tops of the plant are used for making its various medicinal preparations, the leaves being of most value in their second year, or in the autumn of their first. Its actions resemble those of belladonna and stramonium, and it is frequently used as a sedative in bladder affections, and combined in pills with purgative drugs to prevent severe griping.

HENNA: For the Hair. Henna is a small shrub, the leaves of which, when dried and powdered, are used to make a reddish-brown dye. In small quantities it makes an admirable shampoo, for brunettes, giving brightness to the hair after washing.

In using the hair dye about 7 oz. of powder are required for one application. This quantity is divided into two portions. The first part is mixed with a pint of boiling water, allowed to stand for a short time, but whilst still hot applied to the hair by means of a brush. The second portion is made into a moderately thick paste with water and applied to the hair, being kept in place for about half an hour by wrapping a towel round the hair. The hair is then rinsed in tepid water. Re-colouring is necessary in about a month. *See* Hair.

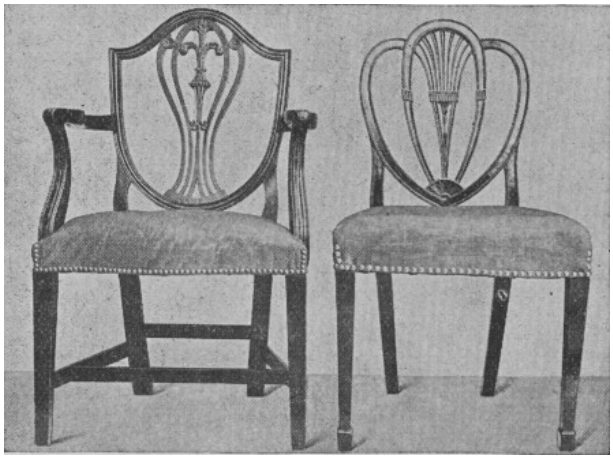
HEPATICA. Belonging to the anemone family, hepatica is a spring-flowering primrose-like plant which loves the shade.

There are single and double varieties of white, blue, and red colouring. Hepaticas need rather light leafy soil in a partially shaded place and should be left undisturbed for years as they dislike being moved. In time they may become overcrowded and bloom sparsely: then lifting and replanting as soon as the leaves have died down is recommended.

HEPPLEWHITE: The Style. This style in English furniture is named after George Hepplewhite, a cabinet maker and designer who worked in London until his death in 1786. The general lines of his furniture, like those of Sheraton, show the Adam influence, and the pieces are in good taste, with the ornament dignified and restrained.

Hepplewhite used carving to ornament his chair backs where Sheraton generally relied for decoration upon marquetry or painting. His wheat-ear shield-back chairs, those with the Prince of Wales's feathers, and others with carved festoons of drapery, or a vase forming the centre, to which the husks or drapery were attached, are now highly valued by collectors. Like Sheraton, he favoured square, tapering legs, but these were ornamented by flutings or grooves, into

which he often introduced carved husks. The friezes of his sideboards and the console or pier tables of the time he ornamented with carved paterae of rosettes, which sometimes were alternated with vases and scrolls; occasionally the masks of lions, rams or goats were introduced. Some of his mirror frames were designed for gilding, and these are generally similar to those of the Adam style.



Hepplewhite. Chairs in walnut, with silk upholstered seats, and backs showing designs characteristic of this maker's style. (By permission of the Director, Victoria and Albert Museum, S. Kensington)

One of his specialities was enamelled or painted furniture, and for this he used beech or birch, which was first covered by an enamel lacquer, generally black, white or ivory colour, and then decorated with painted flowers, or occasionally with cameo-like medallions. Some of the titles of his furniture now strike us as peculiar, e.g. cabriole chair, which in his case meant a stuffed back and did not refer to the curved form of leg; bar-backed sofa, which was a settee for three or four people, formed like chairs joined together side by side, with an arm at either end; tea chests; knife urns and some other terms which have since gone out of general use.

The knife urns are distinctive and attractive accessories, sometimes in the form of Etruscan vases, often made of richly figured Spanish mahogany. They stood upon the pedestals which, together with a side table, formed in combination the sideboard of the period. Some of Hepplewhite's oval trays are inlaid with marquetry, generally having a centre ornament surrounded by festoons of husks. Like Chippendale and Sheraton, whose books of designs furnished the patterns for contemporary makers, Hepplewhite has got the credit for a great deal of furniture which actually was made by his contemporaries. *See* Antique Furniture; Armchair; Knife Box; Mahogany; Settee; Sheraton; Sideboard.

HERACLEUM. Also known as the giant parsnip, Heracleum giganteum is only suitable for the wild garden or shrubbery, by reason of its exceedingly robust growth. It bears very large lobed leaves and umbels of creamy-white flowers; under suitable conditions it will reach a height of 10 ft.

Heracleum can be grown in any ordinary soil, and is best planted in autumn. Propagation is by seed sown in spring, or by division of roots in October or March. The plant is sometimes called the cartwheel flower because of its huge heads of bloom. Pron. He-rak-le-um.

HERB: In Cookery. Herbs are employed in cookery for flavouring many dishes. The best flavouring is afforded by freshly gathered powdered herbs, but there are one or two special mixtures of preserved herbs on sale. The ordinary sweet herbs sold by grocers contain about two parts parsley, the remainder being made up with thyme, and occasionally marjoram.

The herbs most frequently employed include sage, thyme, marjoram, mint, parsley, hyssop, chervil and coriander, the cultivation and uses of which will be found described under their separate headings.

Among all the herbs marjoram may be said to excel in flavour. Marjoram is an excellent addition to soup, meat and fish, and can be used in stuffing.

Herbs to be dried must be gathered on a dry day. Remove all discoloured leaves and put the remainder in a cooling oven, leaving them until they are crisp enough to be pounded. Any great degree of heat must be avoided, for this will destroy the aromatic properties of the herbs. When the leaves are thoroughly dried shake them in a large sieve or basket and then pound them into fragments. Put these into wide-mouthed and well-stoppered bottles, in which they may be stored for 12 months or more. In purchasing dried herbs select those stored in bottle in preference to those made up in packets.

Herb Vinegar. Fresh herbs only should be used in making this vinegar. Collect the young leaves of as many different varieties of herbs as possible, wash and dry them, and then put them into glass jars or wide-necked bottles, filling them three-parts full. Fill the jars with vinegar, seal them down, and then store them in a cool, dry place. In three weeks the vinegar may be strained and bottled. *See* Bouquet Garni; Herb Garden.

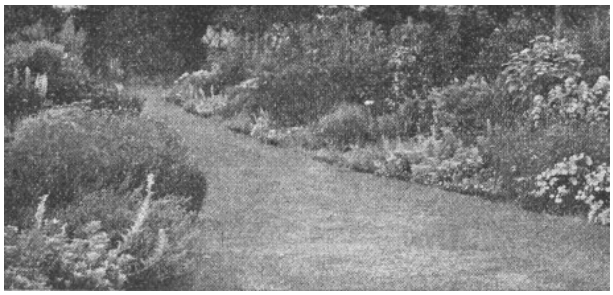
HERBACEOUS BORDER. The herbaceous border consists of herbaceous perennial plants, that is to say, plants the foliage of which dies down in the autumn, but which comes up again season after season. The plants may be left permanently where first established, but many benefit by being dug up and transplanted every 3 or 4 years.

Plants which increase too rapidly may be separated in the spring. When once established the herbaceous border needs only superficial attention, provided it has been well prepared in the first instance. The border should be dug out to a depth of 2 ft. and enriched with manure.

The best periods for planting perennials are spring

and autumn, the more robust plants during October and November, and the choicer kinds in March and April.

By planting a careful selection of kinds and varieties it is possible to ensure a brilliant display of bloom throughout the summer and autumn months. It is usual to place the plants in groups of three, five or seven, according to the size of the border, rather than to set them singly. Charming colour schemes can be arranged by grouping the plants according to the colours of the flowers. The most effective arrangement is to start at each end of the border with white and pale blue, and follow with pale yellow, rose, mauve, and purple; working up to crimson and scarlet in the middle of the border.



Herbaceous Borders which provide a display of bloom in summer and autumn.

Some of the chief hardy herbaceous perennials are the following: Lupin, delphinium, Shasta daisy, phlox, paeony, pyrethrum, oriental poppy, sea holly (eryngium), globe thistle (echinops), heuchera, Michaelmas daisy, golden rod (solidago), Japanese anemone, purple sage (Salvia virgata), day lily (hemerocallis), and summer starwort (erigeron). To fill spaces between the permanent plants, annuals are sown and gladioli, lilies, and montbretias are planted in spring and dahlias are put out early in June. *See* Border; Flower Garden.

HERB GARDEN. The cultivation of herbs on account of their medicinal properties and as a flavouring in cookery is one of the oldest forms of gardening, and herb gardens are still to be found in many parts of Great Britain. Herbs most usually found in gardens include mint, thyme, marjoram, hyssop, peppermint, borage, dill, fennel, angelica, sorrel, tarragon, chervil and coriander. Although strictly not an inhabitant of the herb garden, lavender is often to be found therein. The best position for the herb garden is between the flower and kitchen gardens.

The majority of herbs are propagated by slips taken in the autumn, or, in the first place, by seed sown in the early spring. They may be arranged in drills or patches, and the plants should remain undisturbed, except for thinning.

HERMITAGE: A French Wine. There are three varieties of hermitage, which is a high-class French wine of the Côtes du Rhône, and is either red, white, or straw colour. The red wine, when it is of the first quality is not bottled until it has been four or five years in cask. It has a bouquet recalling the raspberry, and has a remarkably clean, fresh, full vinous flavour, great firmness and softness, and a rich deep purple hue.

White hermitage, which is made of white grapes only, has been described as the finest white wine France produces. Its colour should be a pale yellow. Its bouquet is like that of no other known wine, rich and spirituous in flavour and perfectly dry. The straw colour hermitage is rare and expensive. It is noted for its freedom from all acidity, its smoothness, and marrowy richness of flavour.

Hernia. *See* Rupture.

HERON'S BILL. A plant somewhat similar to the hardy geranium, and sometimes called stork's bill: its botanical name is erodium. It flourishes in light, sandy soil in the rock garden. Some of the best sorts are guttatum, white, 6 in.; Reichardii, pink and white, 2 in.; and macradenum, white and violet, 6 in.



Heron's Bill. Geranium-like flowers of a plant useful in the rock garden.

HERPES: A Skin Disease. Simple herpes, fever blister, or cold sore is an acute inflammation of the skin, accompanied by the development of small blisters. Beyond lightly covering over the spot or sore with cold cream or a little zinc ointment, no treatment is required, the eruptions tending to heal themselves spontaneously. *See* Shingles.

HERRING: How to Cook. The usual way of cooking herrings is to fry them. After it is cleaned the fish can either be slit open or can be cooked as it is. Heat a little dripping in a frying-pan, and fry the herring in it, turning it when one side is done.

To broil the fish, gut and clean them, but dry them well. Score the fish across each side, season them, and dredge a little flour over them; then cook them on a well-greased gridiron. Before dishing, brush the fish over with butter, which should be ready melted in a small pan. Sprinkle them with lemon juice and a little cayenne pepper, and garnish with fried parsley.

Another method is baking. Remove the heads and tails, gut the fish and clean them. Grease a pie-dish with good dripping and lay the fish in it. Add one or two chopped shallots and a little chopped parsley, thyme and marjoram; a bay-leaf may also be laid in the dish. Season well, and put more dripping on the fish. Cover the dish with greased paper, and bake it in a moderate oven for 15 to 20 min. Each fish should be laid separate, not one on top of the other. Serve with mustard sauce.

To souse herrings, clean and bone them, roll them up with a small piece of onion in each, and pack in an enamel or fireproof dish. Cover with vinegar and water, adding 2 or 3 cloves, 3 bay-leaves, some black peppercorns, and salt. Bake in a hot oven 20 to 30 min. Serve cold. These are known as "Mops" in some parts of the country.

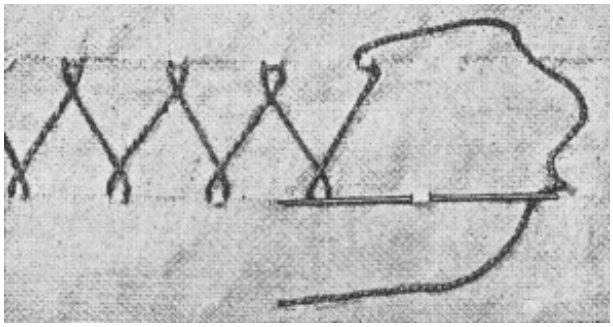
When cured, herrings are known as bloaters and kippers. Bloaters are salted whole, then strung on thin piles and smoked with wood smoke until dry, and the curing process is completed. Yarmouth bloaters have always been considered the best. Kippers are herrings salted and smoked, but before curing they are split open and gutted. They can be cooked by the same methods as bloaters.

Roe of the Herring. The roe of the herring, either fresh or salted, can be served in a variety of ways, and makes a savoury or a breakfast dish. This is one method of cooking soft roes: Fry lightly in butter 3 or 4 roes from fresh herrings, lay them in a greased pie-dish with two tablespoonfuls of chopped mushrooms, 1 tablespoonful of chopped parsley, and 2 shallots, also chopped. Bone and fillet 3 anchovies, add these with a good squeeze of lemon juice, and season well. Pour over the roes the butter used in frying, and cover with brown sauce. Put a greased paper over the dish and bake for 5 min.

The roes may also be served plain. Blanch them, cut them in convenient pieces, cook them a few minutes in butter, and serve on croûtes of toast. A better flavour is given if, before serving, a little lemon juice is sprinkled over the roes and they are seasoned with salt and cayenne. The roes may be left whole.

Hard roe may be boiled, pounded, and made into potted meat if mixed with butter, flavoured with mace and well seasoned. *See* Bloater; Cod's Roe; Fish; Kipper.

HERRING-BONE STITCH. This stitch is chiefly used for seams on flannel and similar materials that are too thick to be turned under, the raw edge being herring-boned on the wrong side. It takes the position of the ordinary hemming stitch. It is sometimes called Figure 8 work, and reference to the illustration will show the similarity.



Herring-bone Stitch, used for catching down the raw edge of a seam in a thick material.

With a little care and a good eye for measurement, it is not necessary to space out the actual places for the stitches, but, for the beginner's guide, dots can be placed along an imaginary top and bottom line, which will decide the depth of the stitch. For an ordinary hem this is J in., and each stitch is ¼ in. apart on the same line. Dots can be marked with a lead pencil at equal distances apart, or on loosely woven materials a thread can be drawn at the top and bottom of the space to be covered, and an even number of threads taken up and missed on the material. The work proceeds from left to right, and the stitch is taken up on top and bottom lines alternately, as shown in the illustration.

HESSIAN: A Canvas. Common canvas, or jute hessian, employed for packing bales and making a foundation for oilcloth and linoleum, is sometimes known as burlap. The material has sundry household uses, such as making coarse aprons, ovencloths and underlays for mattresses to preserve the ticking from contact with the wire springs of the bed. Hessian can be used for wall decorations; for example, in making panels or friezes. The natural colour is buff, but it can be dyed a deeper shade, black, dull green, or blue quite successfully. Pictures look well against a background of burlap or hessian, and advantage is often taken of this at exhibitions.

The material is cheap and obtainable in different widths and qualities. It is often stencilled; or embroidered in simple designs and used for short curtains, garden cushions, blotters and work bags. It is effective, when dyed black and embroidered in bright coloured wools, for a writing table set and in buff for cushions. *See* Woolwork.

HETERODYNE. When alternating currents of two different frequencies flow together in a circuit they combine to form a new frequency (called the "beat" frequency) which is equal to the difference between the original frequencies.

The superimposing of two sets of alternating currents or oscillations of different frequencies is known as "heterodyning," and the method may be used in wireless for the reception of continuous wave (C.W) transmissions (heterodyne reception) and also for the measurement of wave-length.

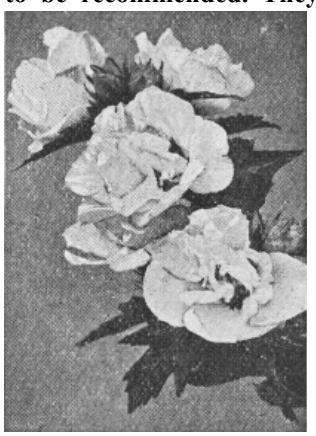
The formation of a "beat" frequency in the manner described above constitutes the principle upon which the superheterodyne receiver is based.

Heterodyne Interference. This is the interference caused by the carrier-wave of a broadcasting station beating with that of another station working on a slightly different wavelength or frequency, thus producing an audible beat note in the receiver. This can be remedied by spacing stations farther apart in wave-length. Another source of interference (rare nowadays) is oscillation from another set.

HEUCHERA. Alum root is the popular name of this invaluable hardy border plant, which produces

long, graceful sprays of bloom in rose, crimson, blush and other colours in May and June. These add to the charm of the garden in early summer and are most useful for cutting. The plants, which form low, leafy tufts, may be planted in spring or autumn; it is wise to leave them undisturbed. They thrive in ordinary well-drained soil in a sunny place. Propagation is by division of the plants in autumn, or by seeds. There are now many beautiful varieties with long flowering stems. Some of the best of these are Edge Hall, rose-pink; Rose Cavalier, rose-cerise; tiarelloides, blush; and Pluie de Feu, red; sanguinea, coral-red, which is an old sort, is also a beautiful and useful variety.

HIBISCUS (Mallow). This is the name of a group of shrubs and herbaceous perennials some of which are hardy, while others are suitable for the greenhouse. The Syrian mallow (Hibiscus syriacus) is the best of the hardy kinds; it is a shrub 5 ft. or more high which bears mallow-like flowers of various colours in August. There are double and single varieties. For cultivation in the warm greenhouse, coccineus, red, manihot, yellow, and rosasinensis, red, are to be recommended. They may be grown in large pots or planted in a border of a soil of loam and peat.



Hibiscus. Flowers of the Syrian mallow (Hibiscus syriacus).

HICCOUGH: How to Check. The commonest exciting cause of hiccough is indigestion. Children who bolt their food are especially subject to it. Drinking very hot or very cold liquids may cause it. It occurs in hysteria, gastritis, appendicitis, alcoholism, sleepy sickness, etc.

There are many ways of bringing an ordinary attack to a close, among which are the following: Give a teaspoonful of raw whisky, a teaspoonful of lemon-juice in which a pinch of salt is dissolved, or a teaspoonful of sal volatile with very little water. Put a pinch of salt on the back of the tongue. A tablespoonful of peppermint water or of cinnamon water, or a few drops of spirit of of sal volatile with very little water. Put a pinch of salt on the back of the tongue. A tablespoonful of peppermint water or of cinnamon water, or a few drops of spirit of a close, among which are the following : Give a teaspoonful of raw whisky, a teaspoonful of lemon-juice in which a pinch of salt is dissolved, or a tea-spoonful of sal volatile with very little water. Put a pinch of salt on the back of the tongue. A tablespoonful of peppermint water or of cinnamon water, or a few drops of spirit of chloroform in ½ tablespoonful of water, are also good remedies.

In the case of children with overloaded stomach an emetic, such as ½ teaspoonful of mustard in a tumbler of warm water, may be very useful. When the hiccough is severe and prolonged, a doctor should always be consulted.

HICKORY. This wood resembles English ash, and is used for much the same purposes. It is slightly superior to ash in hardness and toughness, and also heavier, but it is not very durable in moist, warm, and exposed conditions, as it is liable to be attacked by insects and worms. Hickory is close-grained and nearly white in colour. In boards it shrinks and warps. Its flexibility adapts it for bending and for purposes where it will be subjected to shock and vibration. Hickory is used for hammer, axe and agricultural implement handles, for the hoops of casks, in vehicle building, for the spokes of wheels and backs of chairs, for oars. etc. *See* Wood.

High Chair. *See* Baby Chair.

HIGH FREQUENCY (H.F.). This is a term applied to alternating currents or oscillations having a frequency above approximately 10,000 cycles per second, as distinct from alternating currents of low or audible frequency. High frequencies (radio frequencies) are employed for broadcast transmission purposes, etc. When the frequency is very high it is often termed an electric oscillation.

HIGHLAND FLING. In the Highland Fling the dancer, while hopping on one foot, makes a series of rapid movements with the other, and finishes with a complete turn. The arms may be held akimbo, but it is usual to raise one arm above the head, and this is invariably done in turning.

The dancer begins by pointing the right foot to the side while hopping on the left. The next motion is to bring the right foot behind the left leg, then in front of it just below the knee, and again behind it. These movements are repeated with the left foot while hopping on the right, then again with the right, and again with the left, finishing with a complete turn to the right. The whole series of steps is repeated, beginning with the left, and finishes with a turn to the left.

In the second step the dancer hops on the left foot and points with the right, brings the right up behind the left leg, points with the right again, then brings the right up in front of the left, just under the knee. This is repeated three times, with alternate feet, finishing with a turn to the right, and the whole is again performed beginning with the left, with a turn to the left.

The third step resembles the first. 1, 2, 3, 4, fling movement 3 times with the right foot, finishing complete turn to the right. Repeat over again, beginning left. In the fourth, while hopping on the left foot, the right is pointed as before, brought up behind the left leg, pointed in front, and kicked out in front,

then the dancer rocks from leg to leg, beginning on the right. The step is repeated three times, on left, right and left feet alternately, each of the four steps taking eight beats instead of four.

The other steps are similar, but the heel and toe movement is introduced as a variety, the dancer touching the ground first with the toe, and then with the heel, instead of bringing the foot up before and behind the leg. There are variations also in the times and number of turns. Each step takes 8 bars, or 32 beats of music. In the first, second, third, and sixth steps the turn is on the fourth and eighth bars, while in the fifth step it is on the second, fourth, sixth and eighth bars.

In the seventh step the first four beats are the same as the second, then the right foot is slipped behind the left leg, brought to the ground, and as the weight is transferred to the right leg the left foot is passed in front of right shin. This back step is repeated with the left leg, then the right, then the left, and the whole is then repeated from the beginning, with left, right, left. Like the fourth step, this step is done four times only, and with no turning.

In the eighth and last step after the first four beats as in the first step, left toe and heel are pointed in front, and the same movements are made with the right foot and repeated with left and right, turning round to the right with the left foot working round the right leg. The movements are then repeated, toe and heel once only this time, finally turning round to the left twice on the left leg.

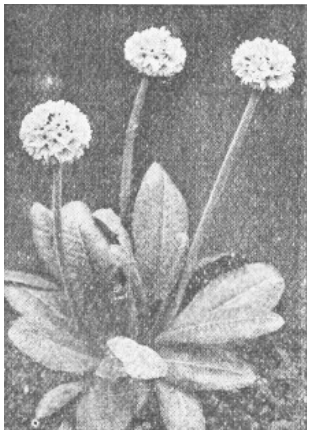
HIGH TENSION VOLTAGE. This is the voltage which is applied to the anode (plate) of a wireless receiving valve, and may be derived from a battery of dry cells or accumulators, or (in all modern sets) from the mains. The high tension voltage necessary depends upon the type of valve and its position in the set. Suitable values are given on the leaflet supplied by valve makers.

High tension batteries of either the dry cell or accumulator type comprise a number of cells connected together in series. Tappings are provided to enable the required voltages to be obtained. H.T. dry batteries employed with receivers utilizing three or more valves should be of the large capacity type. Batteries of the ordinary type, having smaller cells, require more frequent replacement.

H.T. accumulator batteries are equally suitable for small or large sets, but must be re-charged at regular intervals. Sulphation will rapidly occur if the cells are allowed to remain in a discharged condition. Never short-circuit the battery. H.T. batteries are now mainly confined to battery-operated portable sets. *See* Accumulator; Battery.

Himalayan Poppy. *See* Meconopsis.

HIMALAYAN PRIMROSE. This is the popular name of Primula denticulata, a beautiful hardy plant which bears lavender-mauve blooms in spring. It is suitable for the rock garden or flower border, and should be planted in loamy soil in partial shade.



Himalayan Primrose. Rosette of leaves and lavender-mauve flower heads of a beautiful rock plant.

HINDQUARTER. The hindquarter of meat consists of the leg and loin either of beef, veal, mutton, or lamb. That of beef is always divided into joints. Of these the shin is used for boiling and stewing; the topside and silverside for roasting, boiling, or pie meat; the aitchbone for roasting; the rump for roasting or steaks; and the sirloin for roasting. Part of the thin flank also belongs to the hindquarter of beef, and this piece is suitable for braising.

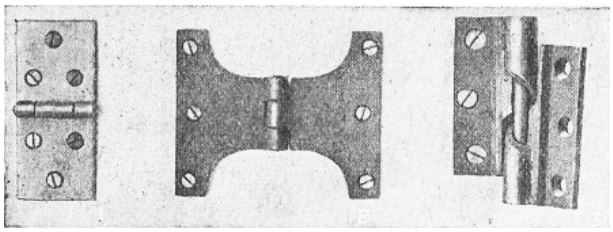
The hindquarter of veal, like beef, is cut into joints. The top portion of the leg is divided into the fillet and cushion, which is the part used for roasting and cutlets, and the lower half is the knuckle, suitable for boiling or stewing. The loin is usually roasted, but sometimes is braised in a casserole.

The hindquarter of mutton is either cooked whole, when it is called the haunch, or it is divided into the leg and the loin. The leg can be boiled or roasted, the loin roasted, braised, or divided into chops. The hindquarter of lamb is frequently cooked whole, and is called hindquarter, not haunch; it can be cut into leg and loin, and treated as for mutton. *See* Aitchbone; Beef; Joint; Mutton , Veal.

HINGE. A hinge is a movable joint, whereon a door turns, in relation to a frame or other fixed portion. Types vary from a tiny metal fitting to one weighing several lb. The form in common use is the butt hinge, made in brass cast iron, or steel. The kinds here illustrated include back-flap hinges (Fig. 1) made of steel or wrought iron with welded butts, and useful for an object that is long in proportion to its breadth. Counter-flap hinges have two separate centres about which they turn, so that the hinge is flush with the surface when the flap is down, and lies flat upon the counter after it has been swung aside.

Skew butts, or rising hinges (Fig 3), are those in which one element of the hinge is adapted to rise and fall upon the hinge-pin, by cutting the faces of the butts at an angle instead of having them square. As the door rotates the hinge lifts, and the door with it. This enables the door to clear the carpet, and where the floor is not quite level it may obviate the necessity of cutting a part off the bottom of the door. Where it is

desired to remove the hinged member from the fixed portion or frame, the lifting butt is of service; one part of the hinge may be lifted, from the other.



Hinge: various types. Fig. 1. Back-flap. Fig. 2. Parliament or shutter hinge. Fig. 3. Skew or rising butt.

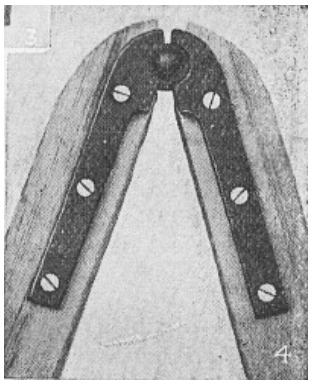
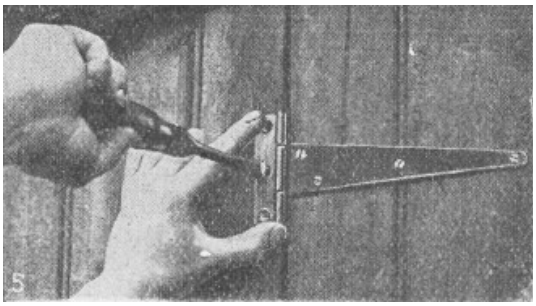


Fig. 4. Trestle-joint hinge.

Parliament or shutter hinges, shaped as in Fig. 2, are made so that when the shutters are open they fall flat against the surface of the wall. Trestle-joint hinges (Fig. 4) are in malleable iron, for step-ladders or trestles. Cranked chest hinges of wrought iron are specially for the lids on chests or boxes. T hinges (Fig. 5) are for hanging doors, as are the cross-garnet, similar in pattern. The tumbler T hinge, or cellar-flap hinge (Fig. 6), is for hanging the flap of trapdoor; the trap can rest upon supporting battens and relieve the hinges of their weight. Large doors, as in stables and garages, are made with a gate hinge or hook and ride. Collinge's patent spherical gate hinge is fitted with a ball-shaped pin, and the hinge or ride has a cup which forms a bearing for the ball, furnishes a receptacle for oil, and is fitted with a leather washer, which renders it watertight. Ball and cup are specially hardened, and this type is very useful for heavy doors or gates.



Hinge. Fig. 5. T hinge being fitted to the door jamb.

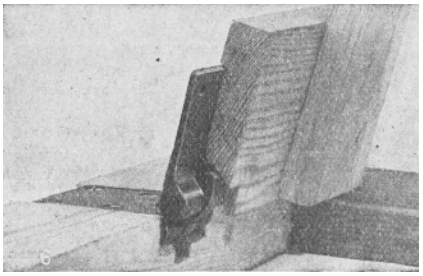
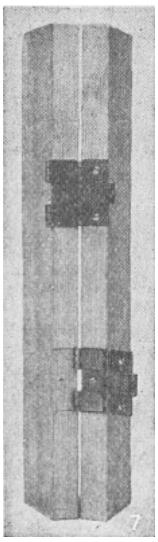
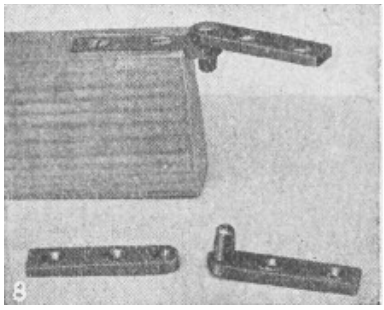


Fig. 6. Cellar flap hinge with wood cut away to show construction.

Table-flap bracket hinges are handy for supporting flaps or hinged brackets; they act as a supporting bracket, and can be folded back with the flap. Draught-screen hinges (Fig. 7) are used for folding draught screens and similar purposes; by their aid the hinged member can turn in two directions. Brass centre hinges (Fig. 8) are used for struts and similar supports.





Left Fig. 7. Screen hinge, at the top, fitted in place; at the bottom, in the first stage of fitting Hinge. Fig. 8. Brass centre hinge, separately and with one half fixed.

Fitting Hinges. When fitting hinges the pins must be true and in line. The flap should sit fair and square in the recess cut for it in the framework. This recess must be so shaped as to preserve the alinement of the hinge pin, otherwise the hinges will quickly bind and break away, even if the door can be induced to turn upon them. When hanging a door or a casement window, it should be placed in the frame and wedged up off the ground, the positions of the hinges being marked on door and on frame, and from them the outlines of the hinges are marked upon both, squaring them off. A recess has then to be cut in the frame and in the door for the flanges of the hinges, which may be fixed temporarily in place. The door is then tried, and if all is correct the remaining screws are driven home. It is important when screwing the hinges in their place that the door be wedged up, otherwise its weight will cause the hinges to sink, and the door will jam at the bottom. It is also important to see that the door is plumb and upright, or, in the case of refitting the door, that it fits closely against the door stopping.

To remove old hinges when the screws are rusted in is often troublesome. The difficulty may be met by tapping the hinge itself, especially round the parts where the screw-heads are countersunk. This will often free the head of the screw and allow it to be withdrawn. Paint should be chipped away, or burned off with a painter's blow lamp, which will loosen the screws. When all else fails, the pins may be punched out and the flanges of the hinges chipped out with a cold chisel and hammer. Another plan is to drill out the heads of the screws and then cut them away with a countersink. *See* Casement; Cross Garnet Hinge; Door.

HIP DISEASE. Generally hip disease means

chronic tuberculous disease of the hip joint. This is not uncommon in children. In the early stage the affected leg is apparently longer than the sound one, the muscles show wasting, and the buttock becomes flattened. The joint grows stiff and the child limps, the pain increasing and the leg becoming apparently shorter than the sound one.

As soon as the disease is discovered the child must be put to bed (on a hard mattress) and kept there for at least three months, or preferably for a longer period. Complete rest of the joint may thus be secured and extension carried out by means of special apparatus. When the pain disappears and the disease shows improvement, the child, fixed in a Thomas' splint, may be allowed to walk about on crutches. The splint should be worn continuously until six months after all signs of active disease have passed away. As in all other forms of tuberculosis, the child's general health must be carefully attended to. *See* Tuberculosis.

HIPPEASTRUM. This bulb plant, which is commonly known as amaryllis, is invaluable in the greenhouse, where it blooms in late spring and early summer. The large lily-like blooms are very handsome, and the modern varieties are of brilliant colouring; they vary from white through rose to crimson. The best time to make a start is in winter or early spring. The dormant bulbs are then potted singly in 5-inch or 6-inch pots in a rich soil compost consisting of loam two-thirds and leaf-mould and decayed manure one-third, together with a scattering of sand. A temperature of 50—55 degrees is suitable. Watering must be carried out very carefully until the bulbs start into growth, so that the soil does not become sodden.

When the flowers are over, and the leaves begin to turn yellow, watering must be discontinued gradually, and, finally, when all the leaves have fallen, the soil is kept quite dry. The pots of bulbs are placed on their sides in a greenhouse or frame, where they will be safe from frost. When in winter or early spring the bulbs start to grow again, some of the old soil should be removed and replaced with fresh compost. It may be necessary to repot some of the largest bulbs, but annual repotting is not necessary.



Hippeastrum. Brilliantly coloured flowers of hippeastrum or amaryllis, a favourite greenhouse plant.

HIPPED ROOF. In building this is the name given to a roof in which the adjacent sides are inclined and form salient angles. It is a more difficult construction than the ordinary lean-to or span roof, and is used in gable construction or where a more ornamental roof is required than the normal span roof. *See* Roof.

HIRE PURCHASE SYSTEM. The hire purchase system has to-day taken the place of the old tally trade and has increased enormously of recent years. It is now very frequently adopted not only for the purchase of luxury articles, such as motor cars, gramophones, furniture, and wireless sets, but also for the supply of business machinery and plant. Probably 50 per cent of motor cars sales, 50 per cent of furniture sales and 10 per cent of jewelry sales are made under hire purchase agreements.

The system enables the purchaser to obtain the use of goods on payment of a small deposit, the rest of the price being paid in instalments out of his future earnings. If properly used it is undoubtedly of great value, but the temptation to acquire some article at once for a small payment is apt to lead the hirer to incur liabilities in the way of future instalments beyond what he can easily pay. A period of illness, bad trade, or loss of employment may then follow and the hirer will be unable to keep up the payments; the goods will be seized and the payments forfeited.

The Agreement. A hire purchase agreement is in form an agreement by which the owner agrees to let goods on hire for a period to the hirer, who agrees to pay a rent. If the hirer punctually pays the rent and keeps all the terms of the agreement, he is ultimately given the right to purchase the goods by payment of a further nominal amount (e.g one shilling). The new Hire Purchase Act of 1938 makes very considerable changes in the law in favour of the hirer. In all agreements to which the new Act applies the hirer must be given a notice which sets out in simple terms what his rights are. In particular he will be entitled to end the agreement at any time by returning the goods, paying all instalments in arrear and any further sum needed to make his total payments equal to half the hire-purchase price. Once the hirer has paid one third of that price the owner cannot take back the goods without first applying to the Court. Before the agreement, the hirer must be informed in writing of the cash price of the goods, unless it is marked in a catalogue or price-ticket which he has seen.

Until the final payment has been made, the goods remain the property of the owner and the hirer cannot sell or pledge them in any way. If he attempts to do so he automatically terminates the agreement and the persons to whom he hands the goods acquire no right to them. Persons should exercise great care in purchasing second-hand cars, gramophones or furniture, for if the goods have been held on hire purchase, they will lose both the goods and their money. Goods held under a hire purchase agreement may be taken by a landlord on distress for rent.

Some protection has been given in litigation. In the past, hirers have frequently found themselves sued in the county court of the owners of the goods, perhaps

many miles away, and in consequence have been unable to defend the action. Now, when one third of the payments have been made, the action must be brought in the County court of the hirer.

Hives. *See* Nettlerash.

HOARSENESS. Commonly due to laryngitis (q.v.), hoarseness is readily produced in some people by exposure to damp, cold air, by fogs, loud talking, or living in damp houses. Those subject to it should keep the feet warm, and should be careful to breathe only through the nose. Inhaling steam gives relief. A hot bran poultice or a cold compress may be applied to the neck at night, precautions being taken next day against catching cold. Gargles are sometimes of use, but less so than inhalations and sprays (q.v.).

HOB. In the house the hob is a part of the fireplace; in the workshop it is a tool used for shaping gears, chasers for screw threads, and other mechanical purposes.

Some of the older houses are fitted with register stoves made of cast iron with hobs at the side. They are picturesque, but uneconomical compared with the modern barless fire. An example is the Sussex grate, having two hobs with a fire basket between them.

In many cottages the hob grate or fire is a central feature, being either constructed of bricks or tiles, or cast in concrete and coloured. An existing fireplace with an iron register stove can be removed, and a modern hob fire constructed of brickwork, and fitted with a dog grate or barless fire, can be fitted. A typical example is illustrated in Fig. 5, p. 775. The hob provides space whereon to rest the kettle or saucepan. *See* Fireplace; Grate.

HOCK: The Wine. The generic name for a number of Rhine wines, mainly white, is hock. It is derived from Hochheim, a town in Germany in the Prussian province of Hesse-Nassau, Johannisberger has the reputation of being the finest flavoured wine in the world. Other well-known hocks are the Steinberger, Rauenthaler, Geisenheimer, Rudesheimer, Marcobrunner, Niersteiner, Hocheimer, and Liebfraumilch. There are also various makes of sparkling hocks. A few red hocks of the Aar district have some reputation, and are recommended for insomnia. French hock is procurable from Alsace-Lorraine.

Hock Cup. There are several recipes for hock cup. It is particularly good for garden or tennis parties, and should be served in a large glass jug. The following is an excellent recipe: Put a large lump of ice in a big jug, and add 1 liqueur glass of curaçao, 2 liqueur glasses of brandy, 1 bottle of hock, and 1 bottle of soda-water or Perrier. Stir well and add borage and a few slices of cucumber.

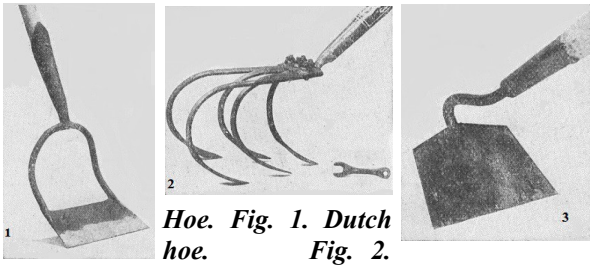
A simple form of hock cup is made from a bottle of hock, one of soda-water, 2 tablespoonfuls of castor sugar, and 2 slices of pineapple. Put these into a glass jug and place it on ice for an hour or more. Just before serving put some small pieces of ice in it. *See* Cup; Dinner; Glass; Ice; Wine.

HOCK: In Cookery. The term hock is usually applied to the fore end of a side of bacon, and represents the shoulder. It weighs about 10 lb. The gammon hock, which is the next cut, is of higher value. The hock is suitable only for boiling. *See* Bacon; Gammon.

HOCKEY STICK. The choice of a hockey stick is not a difficult matter, since its size and other properties are defined and limited by the rules of the game. The few details which can differ, such as a let-in rubber grip for the hands, etc., are a matter of personal choice, and must be considered when buying the stick, together with the most suitable weight, and various other details. The wood should be straight-grained, that is, running straight down from the handle. Such a stick may cost more than one of poorer quality, but it is far more certain to stand the strain of hard and persistent usage.

Like a cricket bat, a hockey stick improves with keeping; and, if possible, it should not be used until it has had a chance of getting mellow, and has become well saturated with linseed oil, which should be rubbed in with a soft rag every few weeks, or oftener. During the summer months, when the hockey stick is out of action, it should be wrapped in an oily rag and kept stored where it cannot get too hot. It should periodically be unwrapped, and, if the wood shows signs of becoming too dry, a little oil should be rubbed in.

HOE: In the Garden. The gardening implement known as a hoe is used for breaking and loosening the surface soil of growing crops in order to admit air and warmth to the roots, and also for eradicating weeds. Hoes are divided into two sorts, draw and thrust.



Hoe. Fig. 1. Dutch hoe. Fig. 2. Cultivator hoe, with spanner for adjusting. Fig. 3. Draw hoe.

The draw hoe is pulled towards the operator, and in travelling the sharp edge of the blade not only breaks up the soil, but cuts through any weeds it encounters. The blade is solid. The Dutch or push hoe has a flat blade, attached to the handle by two metal arms which together make the shape of a horseshoe. The edge of the blade goes into the earth with a cutting motion, and removes the weeds, leaving them lying on the surface.

Hoes are made in all sizes, from 3 in. to 10 in. across, and the handles are 4 ft. or 5 ft. in length. *See* Gardening; Weeds.

HOGMANAY. The night preceding New Year's Day is known in Scotland as Hogmanay. It was formerly the occasion of widespread festivities in the north of England, as well as across the border, and it is still customary to give parties on this night, the guests remaining to welcome in the New Year with song and dance. On the stroke of midnight the dancing is interrupted, and all join hands and sing a verse of Auld Lang Syne.

The custom of exchanging gifts has been superseded largely by the Christmas observances, but it is still a feature of many gatherings. Another old custom which is widely practised is for children to go at night from door to door singing and receiving presents of money and fruit, after the fashion of the carol singers in England. They are known as guisers, and usually wear masks or blacken their faces, wear borrowed clothes and otherwise disguise themselves.

HOLD ALL. In form this is a straight length of waterproof canvas, lined with some strong material and bound with leather. The lining has various pockets in it, designed to take sponge, etc., slippers, and all the small things which have to be packed at the last moment. When this has been done, umbrellas, walking-sticks, etc., are placed in the middle and the hold-all is rolled round them, so that they are held compactly with their ends protruding. A strap with a handle is then adjusted to secure the whole, and the parcel is complete. *See* Luggage.

HOLIDAYS AND HOLIDAY MAKING

Touring Abroad and Seaside and Country Vacations

For further interesting information on this subject see Boarding House; Furnished House; Lodgings; Packing; Tent, etc.

Apart from the question of expense, several considerations enter into the choice of a holiday resort. Persons with young children will usually select one that does not involve a long railway journey, while they will want to go where the sands are good and safe. Personal tastes largely determine the choice. An increasing number of persons play golf on holiday, so they will look for a place with good golf links.

Of those who go into the country for a holiday, many simply seek change and quiet, and as long as these are secured the exact spot chosen matters little. Others will select an area which is pre-eminently a holiday ground, such including N. Wales, the Lake District and Dartmoor. These attract the lovers of wild and beautiful scenery, which in two of the cases mentioned is attained by the combination of lake and hill. Much of Scotland forms a popular holiday resort of this nature. The Trossachs, the islands of the west coast, the glens of Perthshire and the border country afford some of the finest holidays that the active body and brain can desire. In addition to these special areas, there are all round the coast, as in England, watering-places varying in size and attraction. Ireland is less popular than Scotland, and there the tourist is less amply catered for, but the scenery in the west, both in Kerry and Galway, as well as in Donegal and elsewhere in the north, is not inferior to that of Scotland.

Holidays Abroad. A continental holiday is becoming increasingly attractive. Switzerland, mainly but not solely loved by the mountaineer, has long been visited by thousands. Others go to see the architectural and other glories of the cities of France, Italy and the Netherlands. The beauties of the Rhine and Tirol attract others, while an excellent holiday can be spent in the Ardennes, or in Brittany. Apart from these holidays, which are rather in the nature of tours, people can take their families to French and Belgian resorts, where are all the advantages of the ordinary seaside holiday, and gain in addition some insight into the speech and customs of a foreign land. Such visits cost little or no more than holidays at home.

As regards accommodation, holidays may be divided into tours, where one journeys from place to place, and those passed all in one spot. In the former case some persons go from one town or village to another, trusting to find board and lodging when they arrive. Many of these are motorists, for whom the hotels cater, but others are walkers who may desire humbler and cheaper quarters for the night. The addresses of such quarters can usually be obtained from the police and the post office, while many will turn to a village inn.

Motoring and Foreign Tours

Motoring tours are arranged by companies for an inclusive fee. These holidays involve constant movement and staying at a different hotel every night during the period of the trip, but enable persons to see a great deal of the country at a minimum of trouble to themselves and in a very short space of time. One drawback is that as seats must usually be booked some time in advance, the holiday may be taken in unfavourable weather.

The advantages of personally conducted tours arranged by various tourist agencies for an inclusive fee are more obvious when they are taken in foreign lands than when they are taken at home. In both cases the tourist is saved trouble, but in a foreign country this is much greater. He may be ignorant of the language, or at least imperfectly acquainted with it; he probably knows little or nothing of the charges made by the hotels and pensions, or of their suitability or the reverse; while the business of getting from place to place presents other difficulties. Moreover, he need only carry with him a comparatively small amount of foreign money.

Under the direction of qualified conductors tourists can go in parties to the lakes and cities of Italy, the cities of the Loire, the Rhineland, Belgium, Holland, Provence, Brittany, and many other districts further

afield. The fees for these tours are paid in advance, a small sum being required when the tour is booked and the balance just before leaving home. The fee does not include the cost of travel to London, or wherever the trip starts from. The intending tourist should acquaint himself with the conditions, and will be justified in assuming that the fee only provides for those items that are specifically stated as covered by it. For instance, on some tours teas are not provided.

Holiday Accommodation. For persons who take their holidays at the seaside or in the country there is a choice of accommodation, but this depends largely on the money available. Many persons go to hotels, where the charges are usually so much a week, and for those who can afford it there are many advantages in this kind of accommodation. The names of hotels can be obtained from a railway guide, or the advertisements in the newspapers. It is well to write beforehand and inquire the charges and also to book the rooms required.

Many persons go to boarding-houses where they are accommodated at a fixed price per week. These are usually less expensive than hotels. Hydros, turned from their original purpose, cater especially for visitors who wish for social life. In these cases, as with hotels, charges should be ascertained beforehand and the rooms should be booked, especially if in the season.

The majority of visitors to the seaside, however, go into furnished rooms or apartments. Here the usual method is for the visitors to pay for rooms and attendance, but to provide their own food. They pay according to situation, size and other matters, usually so much a week. The local paper and also papers circulating in large towns generally contain the addresses of persons who let apartments, and the railway companies issue lists in their guide books. Most watering places also issue guides, obtainable from the town clerk.

Persons taking apartments should see that the terms of the contract are clearly stated in writing so that they may know what to expect from the landlady. Farmhouses are specially attractive to some persons who like a country holiday, and some of them take in visitors, much as boarding-houses do; but their number is not large. Such addresses can be obtained from the guides issued by the various railway companies.

Another method is to take a furnished house. This has some advantages, especially for a large family, but it entails much work upon the mistress of the house and her assistants, who have not only to do the catering, as in apartments, but also the cooking and other household duties as at home. On the other hand the family can do as they like, being free from the restraints of an hotel or boarding-house. Furnished houses are usually taken through an agent at so much for the week or month. Here particular care should be taken about the contract. The person taking the house should know exactly what is provided and what is not, while the understanding as to breakages and the like should be clearly set out. Furnished cottages and bungalows can be taken on similar lines. They can be obtained through the advertisement columns of a newspaper or from a local house agent.

Safeguarding the Home. Before going away for the summer holiday the householder has to arrange for the security of the house during his absence; the longer he is away the more necessary it will be either to shut the house up or put in a caretaker. Caretakers are usually married couples of the working class, but of late years many ex-service men have undertaken this kind of work. They receive a fixed sum per week and very often gas and coal in addition.

Sometimes two families living in different parts of the country exchange houses, to their mutual advantage, particularly if one house is at the seaside and the other in some inland town. Such arrangements are not confined to friends, but are carried out through the medium of advertisements, which bring people living in widely separated areas, into communication. The result is a holiday for both parties on more economical terms than is possible under ordinary conditions.

If the house is to be shut up during the absence of the family, the chairs can be assembled with other articles in the centre or in a corner of the various rooms, and covered over with dust sheets. Carpets and linoleum are seldom touched even when the holiday is a long one, and mats also may be left to protect the carpets, although sometimes these are beaten and put away, sheets of paper being laid over the carpets.

Curtains need not be taken down, as a rule, nor are blinds always drawn; but in rooms that get much sun the blinds are better drawn, if only to save the carpets. This, however, has the disadvantage of indicating to those who may be on the watch to rob an empty house that it is in that condition.

It is when clearing up prior to a holiday that the housewife realizes the value of cupboards. Into them will go the vases and ornaments that need not be left out to collect the dust; they also take in the glass and china, together with a miscellaneous collection of other goods. Cooking utensils should never be left dirty, but be thoroughly cleaned and dried so that they are ready for use when the family comes back. The bright parts of the kitchen range and the gas cooker, as well as the grates and fenders in the other rooms, may be rubbed with vaseline to prevent rusting.

Where poultry are kept it is usual for a neighbour to undertake the task of feeding in return for the eggs. Another plan, which many prefer to make, is a business arrangement with some trustworthy person living in the neighbourhood who for a weekly sum will take charge of the birds, and dispose of the eggs at the market price. When all these things have been attended to, turn off the gas and water, and see that doors and windows are securely fastened. The post-office should have been apprised already of the new address, which is also communicated to the police when the keys are entrusted to their keeping; and they should be infor-

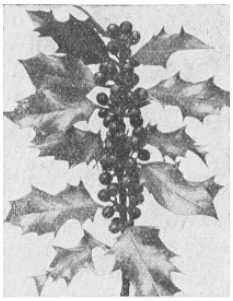
med of the time during which the house will remain without an occupant. Any specially valuable plate or jewelry is sent generally to a bank for safe custody, but if in a safe at home, this fact should also be made known to the police.

HOLLAND. Made chiefly for use as window blinds, hollands are medium-weight linens or cottons, plain woven, stiffened and glazed in finishing to fill up the texture of the cloth, the better to exclude light and prevent the lodgment of dust. Unglazed, plain brown linen sold for children's dress, overalls, etc., is known as holland. Holland may be washed according to the directions given for white cotton goods, and if of a yellow-brown colour, a little tea should be added to the final rinsing water. Holland should be starched and ironed in the same way as prints.

HOLLANDAISE PUDDING. To make this, a custard, flavoured with ratafia, is poured over 4 small sponge-cakes and 15-20 ratafia biscuits broken into small pieces. After this 3 oz. of mixed preserved fruits cut up finely and 1½-2 oz. of sweet almonds, blanched and shredded, are stirred in and the pudding poured into a mould.

HOLLANDAISE SAUCE. To prepare this 3 tablespoonfuls white vinegar, 2 oz. butter, 2 yolks of eggs, and salt and pepper are required. Boil the vinegar to reduce to one tablespoonful, then add two tablespoonfuls water and pour over the egg yolks. Melt half the butter in a small basin and add the egg mixture. Put the basin in a pan containing boiling water and stir until thick. Add remainder of the butter away from the fire and stir until smooth. If too thick add a little hot water.

HOLLY. This, the finest native evergreen, is invaluable for hedge planting, and the ornamental varieties are admirable lawn trees. It grows slowly and is long-lived, therefore it pays to dig the ground deeply and to manure it before planting. Plant holly at the correct season, otherwise it may fail, especially if the plants are large. May and September are the proper times for this work. If the weather is dry the soil must be kept thoroughly moist by watering, and it is beneficial to spray the leaves with water in the evenings of hot days.



Holly. Berry-bearing twig of the common British holly tree.

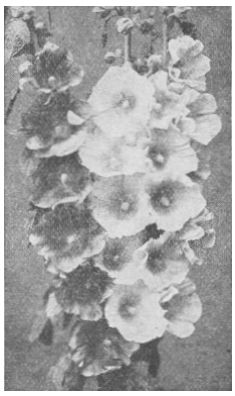
As the male and female flowers of holly are on separate trees it is necessary to plant trees of both sexes to ensure a crop of berries. The correct time to clip holly, whether grown as a hedge or as a specimen tree, is in April or early May and in August. In order to preserve the symmetry of isolated holly trees, long straggling shoots should be cut out in summer. Propagation is by cuttings inserted in sandy soil in a frame in August or by seeds sown out of doors in autumn. There are many fine varieties of the common holly (Ilex aquifolium). These are some of the best: Golden Queen, aurea marginata, Silver Queen and Handsworth Silver (all of which have coloured leaves), camelliaefolia. and altaclarensis.

HOLLY FERN. This is the popular name of a British fern (Aspidium lonchitis). It makes an excellent pot plant for a room window or may be grown out of doors in shade.



Holly Fern grown as a pot plant for indoor decoration.

HOLLYHOCK. This stately old plant, of which the botanical name is Althaea rosea, is a general favourite and invaluable for planting towards the back of the herbaceous border, where its tall spikes of bloom are conspicuous in summer. It needs rich, deeply dug soil to be seen at its best. Planting may be done in autumn or in spring, preferably at the latter season, on heavy soil.



Hollyhock. Tall flowering spikes of different coloured single varieties.

Although the hollyhock is a perennial it is usually most satisfactory when treated as a biennial and grown from seeds sown each year out of doors in June: the seedlings are planted finally in October or if necessary are potted and kept in a frame during the winter. Both single and double varieties may be raised from seeds. If it is wished to perpetuate any specially fine variety, cut-tings of basal shoots may be inserted in pots of sandy soil in a frame in August. If hollyhock seeds are sown in a heated glasshouse in January and the seedlings are planted out in May they will be in full bloom in August. The fig-leaved hollyhock (Althaea ficifolia), with ornamental leaves and yellow flowers, is not commonly seen.

Home Safe. *See* **Safe.**

HOMESPUN. Homespun yarns are normally thicker and more lumpy than factory spun, and this irregularity is imparted to any cloths made from them. Hence homespun has become a name chiefly for woollens of a rough character.

Wool and flax are the two materials most capable of

being homespun, but whether cloth is any better, apart from its rarity, in being homespun is to be doubted.

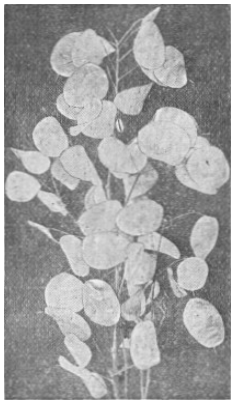
Dissatisfaction has been expressed with the durability of cloths admittedly homespun, and too much should not be expected of them. The fact that they have been made by hand does not necessarily qualify them for good service. The quality of the raw wool, the fineness of the thread, and the tightness of its twisting decide the question of durability. Homespuns rightly command a higher price than machine-made articles, and are valued for their individuality more than for any other feature.

HOMINY. The coarse kind of flour known as hominy is prepared from the inner portion of the maize: it is not considered so nourishing as preparations made from the whole grain. It is used principally for the making of porridge.

Some recipes advocate cooking nearly all day after soaking it overnight in boiling water. But if well soaked and boiled slowly it should not take longer than an hour to cook. Add salt before boiling, and more water if necessary. After the grain is cooked drain away surplus water and add a lump of butter, salt or sugar, and cream—some people prefer salt and pepper to sugar. Hominy cooked thus will make a good pudding for children, and it can be served with jam, honey or treacle. *See* Flour.

HONE: Its Uses. The word hone is often applied to an oilstone, which to a large extent it resembles, except that a hone is a finer-grained stone, and adapted to the sharpening of the keenest tools. It is made from a block of compact stone having a smooth surface, or very fine grain such as novaculite. Other varieties are made from a soft, smooth, yellow slate known as German hone. The carborundum is made from the finest hand-washed abrasive powders, and produces a very keen edge. For general instrument sharpening the carborundum is good; for razor work the yellow, or Belgian rock, hones are preferred.

HONESTY. This is the popular name of a hardy biennial plant (Lunaria biennis) with purplish flowers in spring which are followed by the silvery seed pods so much valued for vase decoration in the home. Honesty will flourish, in poor soil and in sunny or shady places: it is grown from seeds sown out of doors in May each year. Once it has been grown in a garden there are usually numerous self-sown seedlings to be found. The white variety, alba, is very attractive.



Honesty. The flat, white seed pods of this old-fashioned plant, much used for indoor winter decoration.

HONEY. The honey produced by the bee consists chiefly of levulose and dextrose, the former being the fluid portion. Its flavour depends to some extent upon the flowers visited by the bee when a particular section of the comb was being filled.

The finest liquid extracted honey is bright and clear, of a light amber colour, and delicate in flavour and aroma. Extracted honey, when granulated, should be of fine, even grain, creamy white in colour, and of good flavour. There are many grades of medium and dark-coloured honeys which fail to reach this standard, but which are excellent in flavour and aroma; and in some localities these will sell more readily than the lighter samples. Colour does not affect the eating qualities. For instance, heather honey commands the highest price of all. It is in a class by itself, dark amber in colour, gelatinous in consistency and redolent of the moors both in aroma and flavour.

Honey Cakes. The ingredients required are 4 oz. honey, 8 oz. flour, 1 teaspoonful ground cinnamon, ¼ teaspoonful carbonate of soda, 4 oz. sugar, 4 oz. butter, 1 egg, a little milk.

Sieve the flour with the ground cinnamon and carbonate of soda. Cream the butter and sugar. Separate the egg yolk from white, and beat the yolk into the creamed fat and sugar. Then add the honey gradually. Stir in the flour with a little milk as required to make a fairly stiff mixture and mix all together lightly. Whisk the egg white to a stiff froth and fold into the mixture. Half fill some small baking tins with the mixture, dredge the top of each with castor sugar, and bake in a hot oven. They will take 15 to 20 minutes.

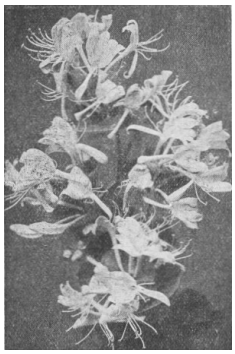
Honey Pudding. Four eggs, ¾ pint milk, a tablespoonful honey, and some slices of bread are required to make honey pudding. Cut the bread into cubes, put these into a buttered mould, and pour over them a custard made with the milk, eggs, and honey. Allow it to soak for 15 mm., and then steam the pudding gently for 1 hour. When set, turn it out of the mould and dust it with castor sugar.

Medical Uses. Apart from its use as a food, honey is employed medicinally. It serves as a demulcent and a laxative, but large doses should be avoided, as they may cause flatulence and griping. It is frequently used as a vehicle for administration of drugs, as an addition to gargles and an external application to ulcers. Because of its soothing properties, it is excellent for relieving affections of the throat, and, mixed with lemon juice, forms a cure for coughs. One recipe for this preparations is as follows: Pour the juice of a lemon over two teaspoonfuls of honey and mix well. A teaspoonful of brandy in addition is useful as a corrective, and assists in cutting the phlegm. Honey is also employed to make soap, and in cookery. *See* Bee; Beehive.

HONEY SOAP. This is made by cutting 2 lb. of

common yellow or white soap into thin shavings, and putting them in a pan over the fire with just enough water to keep them from burning. When they have melted, add ¾ lb. of honey, and stir the mixture till it boils. A few drops of any perfume may then be added, and the soap poured into a deep dish to cool. *See* Soap.

HONEYSUCKLE. There are both climbing and non-climbing honeysuckles, but the former are the chief favourites. The climbing honeysuckles are first rate summer flowering plants for covering arches and trellises. If planted against a hot sunny wall they often become disfigured by the attacks of greenfly. The plants should be pruned when the flowers are over by cutting out some of the oldest shoots: if this work is neglected overcrowding and sparse blossoming will result. Propagation is by cuttings inserted out of doors, or in sandy soil in a frame in autumn. Plants set in autumn or spring in deeply dug and manured soil grow quickly.

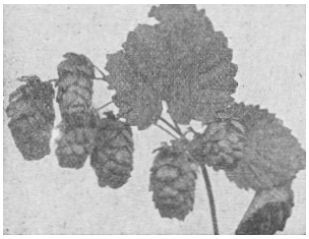


Honeysuckle. Beautiful flower spray of a fragrant climbing plant.

The common woodbine or honeysuckle (Lonicera periclymenum), with reddish-yellow, fragrant flowers, and its varieties belgica and serotina, which bear reddish blooms, are valuable climbers; so, too, is Lonicera caprifolium, cream white and scented. Two evergreen varieties of the Japanese honeysuckle (Lonicera japonica), named flexuosa and halliana, which have pale yellow flowers, are other good climbing plants: the variety aureo-reticulata is grown for its pretty green and yellow leaves. The scarlet honeysuckle (Lonicera sempervirens) is less hardy than the others named, and except in mild districts is better suited to greenhouse cultivation. Lonicera fragrantissima, with white sweet scented flowers, and Standishii, with cream-coloured blooms, are two of the best shrub honeysuckles: they bloom in early spring and should be planted in a sunny place.

HOOK: In Dressmaking. The hooks used in dressmaking are usually sold on cards, together with an equal number of eyes to match. They can be had in black or white and in various sizes. Hooks and eyes are frequently replaced by patent fasteners, which are neater.

HOP. The common hop (Humulus Lupulus), which is perennial, and the Japanese hop (Humulus japonicus), an annual, are vigorous, quick-growing climbing plants for covering arches and arbours. Both thrive in ordinary well tilled soil. The perennial hop, which may be planted in autumn or in spring, is decorative when laden with its fruit clusters late in the summer. The stems are cut down in winter. The variegated leaved variety of the Japanese hop is more ornamental than the green-leaved one and is usually grown in preference to the latter. Seeds of the Japanese hop are sown in the greenhouse in March, the seedlings being planted out of doors in May.



Hop. Spray of the common hop, showing leaves and scaly green fruit.

HOPSACK. Hopsack cloths are almost invariably wool and of a single colour, though they may be striped or checked presenting a neat draught-board or chequer appearance. In a perfectly plain cloth the threads go under and over each other one by one; in a hopsack squares of four, six, or eight threads go alternately over and under. Hopsack woven in small squares is stronger and firmer than when the chequers are large. The cloth feels rather fuller than if the same materials had been plain woven.

HOP SCOTCH: The Game. The children's game of hop scotch can be played on any flat stretch of ground, provided the surface can be marked with chalk or a similar substance. The only implement required is a flat stone, an oyster shell, or something of the kind, called the clipper. It can be played by two or four players. The space is marked out into squares or oblongs, the number, arrangement, and size of which varies to a considerable extent. Seven oblongs make a simple game. They are numbered 1 to 6, the top one being known as the pudding. More compartments and a more complicated arrangement may be used. The ground plan is called the scotch.

Standing a little way from the first compartment, the players decide who shall play first by throwing the clipper to the pudding. The one who lands it nearest a circle in the centre of the pudding plays first. Each player in turn takes the clipper and throws it from the point marked A into the first compartment. He then hops to it, and while hopping kicks it with the foot which he has on the ground back towards A. This done, he pitches it into the second compartment and, again hopping kicks it again towards A. This process is repeated until all six compartments have been reached and the clipper kicked back each time compartment by compartment to A, provided the player has not lost his turn for one of the reasons given later.

When compartment 6, or whatever is the highest number in the game, has been reached, the player pitches the clipper into the pudding compartment. Then, hopping to it, he sends it with one kick straight down to A. A turn may be lost in vatious ways. The clipper when pitched must not lie across a line. It must not be pitched into the wrong compartment. The player when hopping must not put down the raised foot until he has kicked the clipper out of the compartment. His foot when hopping must not touch one of the lines. The clipper must not lie across a line when it is kicked.

The player must kick the clipper in proper order through all the compartments. If any one of these rules is broken, the player who is placed next in turn takes up the game.

HOREHOUND. The dried leaves and flowering tops of Marrubium vulgare, or hore-hound, contain a volatile oil which is utilized in bronchial affections mainly as a constituent of lozenges and cough syrups and also a bitter principle which has tonic properties. *See* Bronchitis; Cough.

HORN: In Decoration. Handles for sticks, umbrellas, knives, and other cutlery articles are sometimes made of carved horn. It is also occasionally used for beads and pendants and frequently for spectacle frames in place of tortoiseshell.

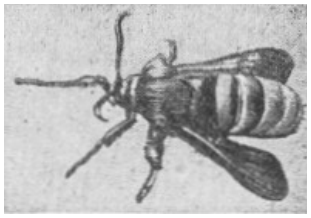
A cement for horn consists of shellac dissolved in methylated spirit to form a mixture of the consistency of thick cream. The horn should be warmed, thinly coated with the cement, and the parts bound together and left until the cement has set hard. *See.* Spectacles.

HORNET: Its Sting. A member of the wasp family, the hornet is not common as a depredator of gardens, but sometimes it strips the skin from dahlia shoots to use as material for nest-building. Interference with them is best avoided, as the bites are very painful. When bitten, if the sting is still in the skin it should be extracted, and if solution of ammonia or bicarbonate of soda is at hand it should be applied, the latter as a paste. Pain may be relieved by fomenting with a hot solution of bicarbonate of soda. *See* Bite.



Hornet. Garden pest, the bites of which are very painful.

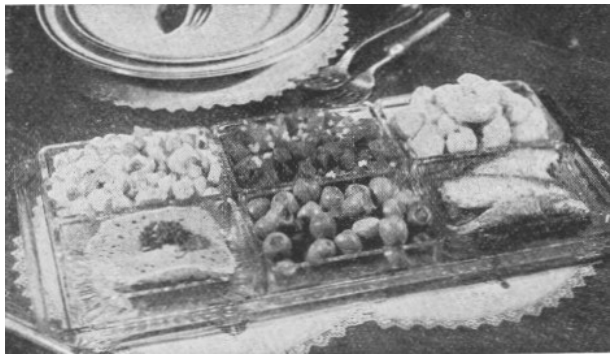
HORNET MOTH. This insect is usually seen about the beginning of June, and its larvae, whitish-yellow with blackish-brown heads, during autumn and winter feed on the stems and roots of poplar trees. Suggested remedies are spraying in February with a caustic soda wash made of 2½ lb. of caustic soda and 10 gal. of water. Uncovered portions of the body should be smeared with vaseline and gloves worn, during use, to avoid burns from the solution. During autumn spray the infested trees and dig in deeply around them a mixture of one part naphthaline to two parts of fine ashes. *See* Insecticide; Spraying.



Hornet Moth. Insect pest which attacks the stems of poplar trees.

HORS D'OEUVRES.

Savoury small dishes are served under the name of hors d'oeuvres at luncheon and dinner before the soup, with the object of giving a zest to the appetite. These dishes are prepared from various fancy sausages, smoked fish or fish preserved in oil, choice salad herbs, olives, gherkins, foie gras, caviare, oysters, and hard-boiled eggs, which serve as cases, the yolk of the egg being stuffed and the white forming the case.



Hors d'Oeuvres. Typical dish of hors d'oeuvres, six favourite varieties being served in separate compartments.

The sausages are skinned and cut in very thin slices, and the fish, if in oil, must be dressed; that is, the oil should be strained off, the fish wiped, and fresh oil poured over, with a little white wine or flavoured vinegar and a seasoning of salt and cayenne. Anchovies are soaked in cold water to remove the salt, and they should be boned. Sardines also should be boned. Smoked fish is served in slices or small portions, according to the character of the fish. Russian and mayonnaise salads are always popular. Beetroot or potato for salads should be diced. Cucumber is sliced and dressed with oil, vinegar, and seasoning. The yolk of hard-boiled eggs is pounded with anchovy butter and chopped gherkin to make fillings for the halved whites.

Scalloped rounds of fried bread make dainty hors d'oeuvres with either a teaspoonful of caviare decorated with savoury butter or a fillet of anchovy wrapped round a ball of egg yolk which has first been moistened with tomato sauce placed on them. Celery may be dressed with mayonnaise sauce. Tomatoes may be dipped in boiling water, skinned, sliced, dressed with equal quantities of oil and vinegar, and sprinkled with finely chopped parsley and onion. Salads for hors d'oeuvres can be made out of any left-over vegetables, such as cauliflower, beans, carrots, peas and potatoes, and dressed with salad cream or with mayonnaise.

How to Serve. Long glass or china dishes are obtainable for hors d'oeuvres with separate compartments for from 4 to 10 varieties. The one illustrated contains a good selection for a small party, comprising potato salad, sliced beetroot marinaded in vinegar and oil and sprinkled with minced parsley and onion, prawns (excellent tinned prawns are ob-tainable), truffled liver sausage thinly sliced, stuffed

olives and sardines. An equally good choice would be Russian salad, egg mayonnaise, fillets of smoked herring, Spanish olives, tomato salad, smoked salmon on buttered canapés. Grape fruit and melon are also served as hors d'oeuvres.

Butter should be attractively made into small pats, balls or curls, placed in a glass dish on the table. Rolls, crisp bread, and toast should be also offered with this first course at luncheon or dinner. Special sets of knives and forks are obtainable, or fish cutlery can be used. *See* Cocktail; Dinner; Luncheon.

HORSES FOR DRIVING AND RIDING

Hints on Buying a Horse and Its Maintenance

Our work contains articles on Bit; Groom; Harness; Stable and other subjects associated with the horse, and also entries on the several vehicles drawn by horses, e.g. Landau; Victoria. See also Curry Comb.

The horses that are chiefly in demand to-day are saddle hacks and ponies used for riding. A horse of this kind should stand still when being mounted, possess a snaffle mouth and be easy to ride. For general utility, the best horse is the hackney, but this is more suitable for the harness than for riding. A good hackney can be of any colour, but bay and chestnut are the most favoured.

Buying a Horse. Perhaps the best method of purchasing a horse is to write to one or two studs and state requirements, or to insert an announcement in one or other of the stock breeders' journals, stating the wants in the advertisement as to age, sex, colour, pedigree, and whether perfectly broken to harness and free from any form of vice or objectionable habits, either in the stable or in traffic. The best age to buy is five or six years, and the best colour is dark bay, but this is a matter of individual choice.

Do not let colour prevent purchase if the animal is sound and suitable in all other respects. Previous to purchase have the animal examined by an experienced veterinary surgeon; the fee ranges from one to two guineas for each horse examined. The intending purchaser should satisfy himself first of all as to the suitability of the horse in all other respects. Many buyers purchase at the horse repositories either in London or in the provinces, and some high-priced horses are bought and sold through these channels.

The animals can be examined prior to sale, but the opportunities for examination and trial are not always very satisfactory. Anyone visiting a repository should read the catalogue carefully, as many of these announcements are liable to deceive the unwary buyer. Many animals carry a specific warranty, such as sound in wind and eyes. In some instances these two features are about the only qualifications that the animal does possess.

If a horse purchased does not comply with the catalogue description, the buyer should proceed to have it examined and certified by a veterinary surgeon. The horse, together with the veterinary surgeon's certificate, should be immediately returned to the auctioneer, accompanied by a letter from the buyer stating the reason for its return. The horse repositories have regulations providing for the return of an animal that does not conform to description; therefore if the buyer complies with stipulation he should have no trouble whatever concerning the return of his money, together with any reasonable expenses incurred.

The foregoing remarks apply to all classes of horses, both light and heavy, ponies, cobs, hunters, etc., purchased at repositories. Horses bought at farms, markets, repositories, etc., without any warranty are purchased under the legal rule of caveat emptor (let the buyer beware), and cannot be returned unless the transaction has been a fraudulent one. If buying from a private person the buyer should endeavour to obtain the animal on a week or ten days' trial, this being a reasonable request when the parties are known to each other. When a warranty is given, it is better for the buyer to have it in writing, though a verbal warranty and the presence of a witness is quite good in law. The price paid for a horse, no matter how high, has nothing whatever to do with its soundness or otherwise.

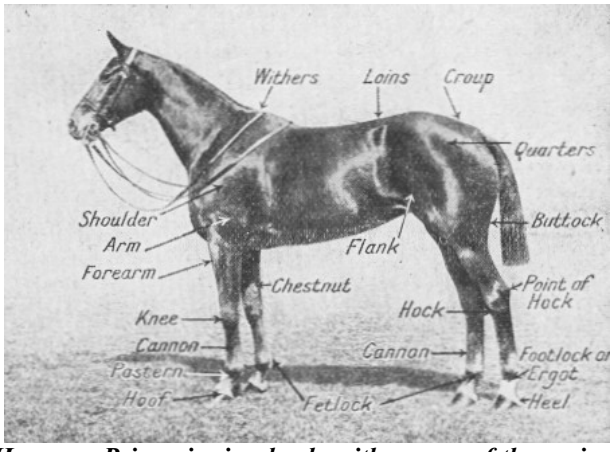
Necessity of Shoeing. All horses require to be shod regularly, say, every three weeks, but some carry their shoes several weeks longer than others, whilst the same animal may wear out two sets of fore shoes to one set of hind ones, or the converse. The feet should never be allowed to become long, as this predisposes to stumbling. Shoes must be removed every three weeks to prevent this.

During frosty weather frost cogs should be fitted to the shoes, but the farrier will usually see to this matter if instructed at the proper time. The shoeing of heavy draught horses in winter, especially if there is ice on the roads, necessitates roughing or sharpening the toe and heel caulks. Shoeing with pads and leathers should be avoided, if possible, as they are liable to damage the feet.

Care of the Horse. Regular exercise, good grooming, and a liberal allowance of food and water, with a comfortable bed of straw and well ventilated, properly drained stables, are necessary for the health of all horses. When in the stable a horse requires feeding three times a day, and a liberal amount of hay between meals.

Oats, either whole or bruised, should be the staple food, but these can be mixed with dry bran, chaff, beans, peas, lentils, etc. Ponies thrive well on 6 Ib. of oats per day if these are mixed with chaff, and ½ Ib. of some other cereal such as maize. The amount of oats per day ranges from 6 to 15 Ib., the latter for heavy draught horses. The condition of the animal and the work it has to perform must be taken into consideration. If turned out to graze, it is an advantage to give 2 or 3 Ib. of oats daily, and a little linseed cake, say, 1 Ib., as grass flesh is much too soft for working purposes.

Horses with long coats require clipping several times a year. The whole of the body and limbs may be clipped, or the hair corresponding to the saddle and that on the limbs may be left untouched. In the winter a heavy woollen rug or two should be put on whilst the animal is in the stable, after it has been clipped, with or without bandages on the lower part of the limbs. Never put rugs on a horse directly it comes in from work, but allow its body to cool first. Again, do not give a feed whilst the animal is overheated, for the same reason. A couple of quarts of cold water will help to cool the body, and this never does any harm.



Horse. Prize-winning hack, with names of the various parts.

The general-purpose horse is generally kept steadily at work, and is therefore stabled and not run at grass. But an animal that is well and carefully fed and driven will stand an immense amount of work without suffering. It must be fed according to the work it is doing. Enforced rest and rich feeding will produce swollen legs and other troubles. It must be remembered that the stomach of a horse is small, and that it works best with its stomach about two-thirds full. It is not well to leave a horse for more than five hours without a feed. In any case, it must never be worked hard on top of a full feed, as that treatment invariably results in broken wind. A horse should be watered before it is fed, but it is a great mistake to allow it to drink freely of cold water when it is sweating. After severe exertion warm gruel should be given.

After a horse is taken in from grass the ration of oats should be small at first. Oats and beans are the strongest diet, and a horse of 15 to 16 hands which is in steady work will require 12 Ib. of oats daily besides hay. But no rule can be laid down, for horses vary considerably in the matter of appetite. When a reduction of diet is necessary bran mashes should be given instead of oats.

Next to feeding, good grooming is most important, and it takes a man an hour daily. The implements required are dandy brush, water brush, curry comb, mane comb, and hoof pick. Many grooms use the curry comb on the horse's body, but this is a mistake, as the curry comb is for cleaning the dandy brush. When a horse comes in hot it must be rubbed down first with a wisp of twisted straw, afterwards, if necessary, with a cloth. No attempt must be made to use the brush until the animal is quite cool. The feet of a horse are usually its weakest point. If a horse's feet are neglected, or if it is allowed to stand on wet bedding, cracked heels and the ailment called grease will supervene. The feet should be cleaned with the hoof pick three times a day. In the harness-room a bottle of antiseptic should be kept for cuts or galls.

Good bedding is essential, and wheat straw is the best material. If moss litter is preferred, 1 cwt. should be put down to begin with, and it must be renewed at the rate of about 6 Ib. per day. If sawdust be used, the depth over the stable floor must be 4 in. Bracken makes good bedding, but the stiff stalks should be removed.

HORSE CHESTNUT. The common horse chestnut (Aesculus hippocastanum) is a native of Greece, though it has been largely planted in Great Britain. Chestnut Sunday is the day on which the famous chestnut trees forming an avenue in Bushey Park, Hampton Court, are in full bloom. This leaf-losing tree attains a large size and grows quickly. Propagation is by seeds sown out of doors in autumn: named varieties are increased by budding in summer or by grafting in March. The red-flowered horse chestnut (carnea) is to be recommended for planting on a lawn. Other chestnuts are flava, yellow-flowered (the American sweet buckeye), and parviflora, which grows only 10-12 feet high and bears white flowers in August.

HORSE FLY: Its Bite. In cases of this kind bleeding should be encouraged, and then a solution of ammonia, bicarbonate of soda, washing soda (weak) or permanganate of soda (strong) applied. After, a dressing of moistened boracic lint covered with gutta-percha tissue or oiled silk may be used. *See* Bite.

HORSEHAIR: In Upholstery. This is the best stuffing material for furniture and mattresses. It is procured from the tails and manes of horses, that from wild horses being the most highly prized. Very little is obtained from England, the greater proportion used in the upholstery trade in Great Britain being imported from the Continent, China, the Argentine, Australia, etc. It is the shorter hair that is used, and of this there are several qualities, judged according to springiness, length, and curl. The curl, or spiral form imparted by the manufacturer, emphasizes the buoyancy which makes horsehair so valuable in upholstery. Adulteration with other hair often takes place.

Besides its resiliency, horsehair is light in weight, and when made up with skill it enables furniture to preserve its shape and comfort for many years. Even after half a century's use, when renovation may be essential, the horsehair stuffing can be reteazed or carded, and replaced almost as a new material. The cost makes it an expensive medium, but the buyer will be repaid by the comfort and durability of the furniture in which it is used, and by a good return of

capital so spent in case of re-sale.

Articles upholstered entirely with hair are necessarily more expensive than when made up with a mixture of hair and other materials. In the latter case, the first stuffing of the piece of furniture is either of fibre or wood-wool, or a mixture of hair with these or with flock, the second stuffing, or that which comes immediately under the outer coverings, being alone of pure hair. It should be borne in mind that although quite serviceable, articles stuffed in this way cannot be expected to equal in ease or durability those made up with horsehair alone. *See* Mattress; Upholstery.

HORSERADISH. The way to grow good horseradish, which is so much liked as a flavouring, is to plant a few roots each year in January or February in deeply dug soil; they should be set at 10-12 inches afpart, the tops 6 inches below the surface. The only treatment required during the summer is to keep down weeds by hoeing between the rows. In autumn and winter the roots may be lifted as they are wanted, or all can be taken up and stored in sand, ashes or soil. For replanting, choose some of the straight pieces of root. The horseradish bed is often left undisturbed for years, with the result that it becomes a very difficult matter to get rid of the roots.

Uses in Cookery. In cookery, the horseradish, with its strong, mustard-like taste, is used mainly as an accompaniment to roast beef. When required it should be washed and scrubbed, left to soak for an hour in cold water, and then scraped into shavings with a sharp knife. It may be served separately in a glass dish or used to garnish the meat. Horseradish may be stored in powder form in tightly corked bottles. The sticks should be sliced and dried in a cool oven before being pounded.

To make horseradish butter, clean and scrape a stick of horseradish, and pound it in a mortar with a lump of butter about twice the size of an egg, ½ teaspoonful of chilli vinegar, a few drops of lemon juice, and cayenne. Pass the mixture through a fine sieve before spreading it on a dish to set. Serve with grilled steak.

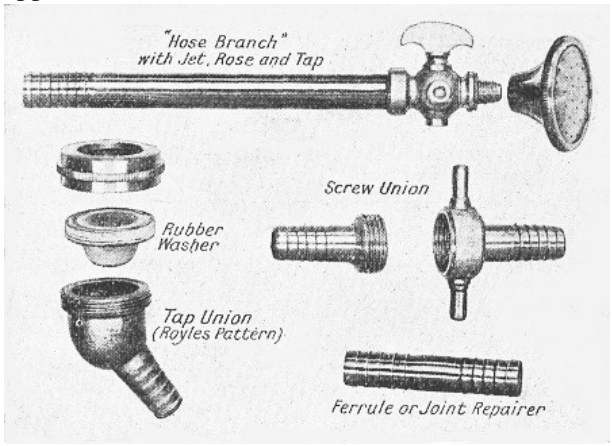
Horseradish Pickle. A pickle may be prepared by scraping off the outer skin from some horseradish roots, cutting the latter into short lengths, and then putting them into jars containing just enough vinegar to cover them. Keep the jars air-tight and in a cool, dry place.

Horseradish Sauce. To a grated stick of horseradish add ½ teaspoonful of made mustard, a teaspoonful of castor sugar, a tablespoonful of vinegar, and a pinch of salt. Slightly whip ¼ pint of cream mix it in and keep in a cold place until required.

HOSE PIPE. The term hose pipe is applied to rubber, canvas, and other tubing adapted for watering purposes. Varieties include the ordinary rubber pipe, made from india-rubber, and a similar type made with an internal lining of canvas. A stronger pattern has an external armouring of coiled wire, that acts as a protection. Suction hose is so constructed as to be non-collapsible. Hose pipe for fire extinguishing purposes is made of canvas or leather.

The ordinary garden hose is made in three sizes, ½ in., ⅝ in. and ¾ in. in diameter. The usual stock length is 60 ft., with a branch and jet, and an attachment to connect to the house water-tap. Fittings include branches, or nozzles, with and without a tap, unions and connexions for joining two or more lengths of hose, and a reel for safe storage. When not in use, the hose should be drained and coiled up, and hung in a cool, dry place.

To repair a hose, if the leak is small, procure a piece of tire duck, such as is used for a cycle cover. See that the hose is perfectly dry, and clean the place where the patch is desired by rubbing with fine sandpaper. Then apply a thin coating of rubber solution, such as is used for cycle tubes, on the hose and also on the patch. Allow both to dry thoroughly, then apply another coat to both, and leave it until slightly dry, but sticky, and press the patch on. It is advisable to have the patch wrapping completely round the hose. If the leak is extensive, it is best to cut out the bad part and rejoin the two ends with a ferrule, binding it firmly with copper wire.



Hose Pipe. Various types of union joints and fittings.

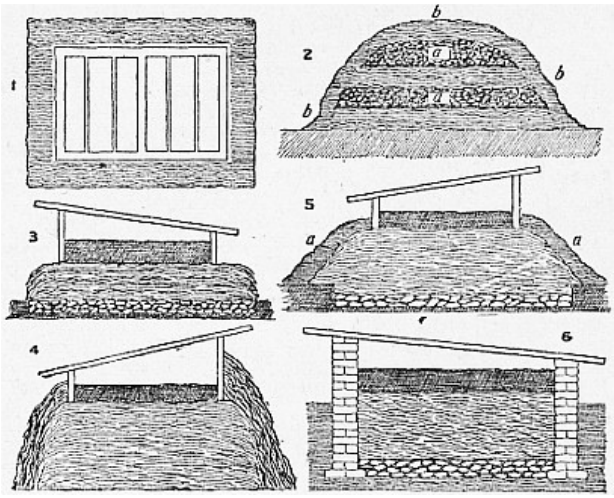
HOT BATH. The effect of a very hot bath resembles that of a cold one—it is stimulating if it lasts only for a few minutes, but if prolonged further it has a debilitating effect. The morning tub is not sufficient to keep the skin clean, and a very warm or hot bath with a thorough soaping, once a week at least, is necessary for this purpose. A hot bath is a ready means of raising the body temperature and restoring energy in cases of shock.

The effects of a hot bath may be enhanced by adding mustard, 1 oz. to the gallon. This is made into a paste with cold water and squeezed through muslin into the bath. A child in a convulsion, or collapse, for example, after profuse diarrhoea, should be kept in the bath for 15 or 20 min., and then taken out and dried quickly. A hot bath taken at bedtime often proves a cure for

insomnia. *See* Bath.

HOTBED: In Gardening. A hotbed is made by heaping up fresh manure which provides "bottom heat" and so helps the development of plants grown in the soil placed on it. The usual procedure is to make up a bed of manure about 2 feet deep and of such a size that it projects 1.2 inches all round beyond the garden frame placed on it. Sifted soil to a depth of 8 or 10 inches is put inside the frame. Numerous vegetables and flowering plants can be raised in spring by sowing seeds in the sifted soil.

To make the hotbed, fresh stable manure is necessary: this material must be turned several times to allow some of the rank steam to escape before it is heaped up to form the bed; the manure must be trodden down fairly firmly. Seeds should not be sown until a few days after the soil has been put on the manure and during that period the frame must be ventilated slightly. In a few weeks the temperature will decline, but it can be maintained by adding fresh manure outside the frame. Hotbeds are also made with manure and dry leaves, the latter being used in the proportion of one third of the bulk. *See* Frame.



Hotbeds of various types. 1. Base plan showing hotbed extension and frame. 2. Economical manure compost: a, grass or leaves; b, horse manure. 3. Common hotbed. 4. How to bank with fresh manure. 5. With covering of soil (a) for plunging or outside forcing. 6. Brick frame with interior hotbed. (By special arrangement with Amateur Gardening).

HOT CROSS BUN. This is a special bun eaten on Good Friday. It is a spiced bun, made as described in the article Bun, and on it a cross is marked with a knife or made in candied peel before cooking.

HOTHOUSE. This is a glasshouse in which a minimum winter temperature of 60 degrees is maintained to allow of the cultivation of tropical plants, or for forcing plants into early bloom. *See* Greenhouse.

HOT PACK. The medical treatment known as a hot pack consists in stripping the patient and rolling him in a blanket wrung out of water at a temperature of about 110°. Two or three other blankets are wrapped outside this, and the patient is kept in the pack for 20 to 30 min. He is then quickly dried with soft, warmed towels, and put in flannel night clothing. A warm drink may be given while the patient is in the pack. The mattress should be protected by a waterproof sheet, over which a blanket has been laid.

The hot pack is often prescribed as a means of inducing free perspiration in conditions such as Bright's disease and other kidney complaints. *See* Cold Pack; Nursing.

HOT PLATE. A short-legged iron cooking table or stove with one or more burners is known as a hot plate, but the term is also used loosely to describe the top portion of a stove where cooking is done. Plates used for covering food to keep it warm at meal-times are also sometimes known as hot plates.

An electric hot plate is a useful table appointment in flats and other small houses where cooking accommodation is limited. It can be used in any room by fitting the plug into the nearest lamp socket and switching on the current. This stove will fry bacon and eggs, toast bread or crumpets, boil the kettle, heat an iron or shaving water, and also cook vegetables. On a double-burner hot plate, two vessels can be used at once. *See* Cooker.

HOT POT. The following is a winter recipe: Soak ½ lb. haricot beans overnight and half cook them. Butter beans, lentils, or dried peas might be used. Cut up 1½ lb. middle neck of mutton into neat cutlets, cutting off some of the fat, if there is too much of it. Then cut into slices 1½ lb. potatoes, 2 moderate sized carrots and one turnip, and chop ½ lb. Spanish onions.

Put all these ingredients, in layers, in a casserole, or fireproof baking-dish, with a layer of potato on top, and cover with stock or water. Cover the dish and bake the hot pot in a good hot oven for about 3 hours, adding seasoning ½ hour before serving, and re-moving the cover of the dish so that the potatoes may brown. This should be served very hot in the dish in which it was cooked.

For a summer hot pot: Cut 2 lb. neck of lamb into chops, put it in a casserole with enough water to cover it, bring it to the boil, and bake for about 1 hour. Then add a little salt, ½ lb. new potatoes, ½ lb. young carrots, ½ lb. young turnips, ½ lb. spring onions, some sprigs of cauliflower, and ½ lb. green peas. Do not cut the vegetables unless they are large. Bake the stew gently until everything is tender, then add more seasoning if necessary and serve with the meat in the centre, the vegetables round it, in the casserole. *See* Casserole; Mutton; Stew.

HOT WATER BOTTLE. Hot water bottles are

made in a variety of shapes and sizes and in several different materials. Of these the two most commonly in use are rubber and stoneware, while occasionally they are found in copper, aluminium, or tin.

Stone bottles should be heated before they are filled. This may be done either in the oven, providing that it is not too hot, or with hot water. In very cold weather only the latter method is suitable, and the water should not be too hot or the bottle will crack. Boiling water should be used for the final filling, and should be poured in until it runs over the top. This will ensure the exclusion of air and cause the heat to be retained as long as possible. If the bottle is only partly filled, the resulting steam may cause it to burst. The stopper must be screwed in securely so as to prevent any leakage of water, and the bottle should be rubbed over before it is placed in the bed.

Rubber bottles may be slightly warmed before filling, but only with warm water. Boiling water should not be used, but as they do not retain the heat as long as stone bottles, it is essential that the water should be as hot as possible. A solution of the difficulty is to pour the water from the kettle into an enamel jug with a sharp spout, and thence into the bottle. This will allow some of the steam to escape without materially lowering the temperature of the water. The rubber bottle should not be filled too full, as it is liable to burst. If it is filled to about two-thirds of its capacity and the empty part is then pressed over before the stopper is put in, so that the water runs up to the neck, pushing the air out in front of it, the stopper may be inserted and the bottle will keep hot for a long time. While filling, the bottle should be rested on a table to prevent the weight pulling on the neck.

Hot bottles for invalids, whether of rubber or stone, should never be put into the bed without a cover of flannel or other woollen material. An uncovered bottle is liable to burn, and the flesh of old or sick people is peculiarly sensitive to dry heat. Covers may be made from blanket cloth or cotton plush and embroidered with a monogram, and may take the form of a bag into which the bottle is slipped when filled.

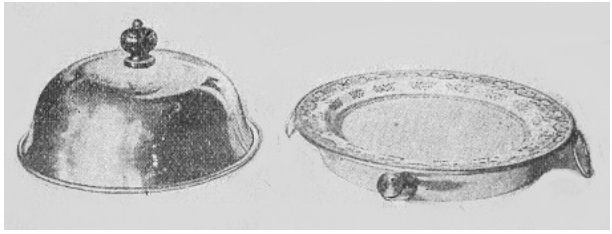
India-rubber bottles are the least likely, tin the most likely, to cause burns. In the case of the paralysed or very weak, or patients recovering from a general anaesthetic, the greatest care must be taken to prevent this accident. Very often several thicknesses of flannel should surround the bottle. It is not desirable that people who suffer from cold feet and are liable to chilblains should use a hot water bottle, but if used it should be placed in the bed at some distance from the feet.

When not in use the bottle should be emptied of water, air allowed to penetrate, and should be kept in a cool, dry place.

When the sides of a rubber hot water bottle become stuck together, no attempt should be made to force them apart. A simple remedy is to pour in some hot water to which a few drops of ammonia have been added, and, after leaving it to soak for two or three minutes, work the sides gradually apart with a wooden skewer or pencil. Before putting rubber bottles away for the summer, blow some air into them with a small pair of bellows.

Electric hot bags are sometimes preferred to hot water bottles, because they are more quickly heated, can be left warm for any length of time, and will not burst. *See* Nursing.

HOT WATER DISH. Food which requires to be kept hot after cooking should be placed on a hot water dish. This utensil is provided with a reservoir beneath the dish itself into which hot water may be poured. If used to hold a large joint for a family, the dish may be taken to the table so as to keep the meat hot while it is carved. Such dishes are made in, silver or all electro-plate, but the one illustrated is more practical for cleaning.



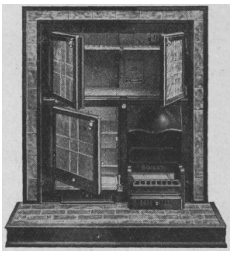
Hot Water Dish, with lid for retaining the heat of cooked food. (Courtesy of A. W. Camage, Ltd.)

HOT WATER SUPPLY IN THE HOME

Comparative Advantages of the Various Up-to-date Systems

The article on Central Heating may be consulted in this connexion, since some heating systems are arranged to furnish domestic hot water. Reference should also be made to Anthracite; Boiler; Geyser; Grate; Oven; Range; Water Supply

A good supply of hot water is one of the essential domestic services. A common method is to draw hot water from a boiler associated with a fire in the kitchen range *(see* Boiler), or from one of the many types of combination ranges. The heated water is conducted from the boiler to a reservoir or container at a sufficient height to supply the highest point at which it is desired to draw off the hot water, this being taken to the various points by means of ordinary piping.

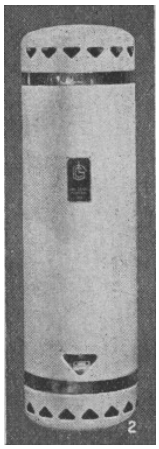


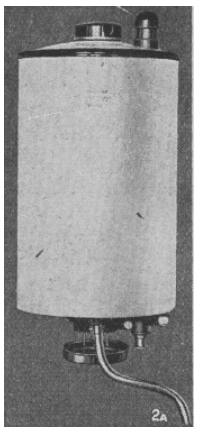
Hot Water Supply. Fig. 1. "Super Chattanette" combination grate, which warms the kitchen, cooks and provides ovens for plate warming and hobs for pots and pans, in addition to supplying hot water for baths, etc. It can be installed without trouble by linking up to existing pipes and making minor brickwork alterations, although if the storage tank is enlarged larger flow pipes may be necessary. (Courtesy, Mitchell, Russell & Co., Ltd.)

A combination boiler designed primarily for a central heating system, will also furnish hot water for domestic uses, a very convenient arrangement for a small house. Fig. 1 shows a useful type of combination cooking range and boiler for hot water supply. Another system employs a separate and independent hot water boiler heated by a solid fuel fire, which is kept alight day and night when a constant supply of water is desired. For really ample supplies of hot water at a low cost the coke or anthracite fired independent boiler is without equal. During the cold months it will help to warm the room in which it is installed.

In warmer weather the merits of a gas or electric system are more apparent, avoiding as they do the need for stoking, and the unpleasant warming of the kitchen. There is no reason, however, why the householder should not instal a dual system, using a gas boiler or an electric immersion heater for summer service, when the coke fired boiler or the cooking range is shut down.

Gas-heated Systems. Gas provides a medium for heating water by two main methods. In one of these the gas burner is kept constantly alight and heats a small boiler known as a circulator. In another type, shown at Fig. 2A on this page, the heater is combined with a storage tank and forms one complete unit. Heat losses are prevented by lagging the cylinder with insulating material, so that a relatively small consumption of gas at the burner suffices to maintain the water at the desired temperature, once the contents of the cylinder have been heated up.





Hot Water Supply. Fig. 2. Gas circulator unit for use with coke boiler system. Fig. 2a. 2-gallon storage single-point gas-water heater, thermostatically controlled.

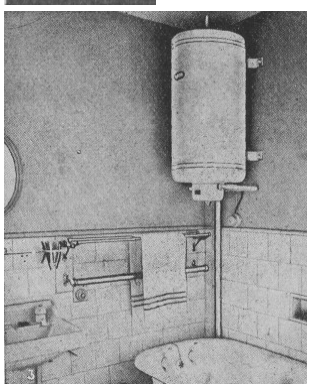


Fig. 3. Electric storage heater fitted in a bathroom (Courtesy of Electric Development Association).

For a small house the thermal storage heater, as this type is named, might have a capacity of 12 gallons, the size being governed by the probable maximum demand at one time. By means of a device known as a thermostat the gas flame is raised or lowered by the temperature of the water. The maximum consumption of gas is 10 cu. ft. per hour, and when all the water in the cylinder has been heated up the thermostat automatically cuts down the consumption to about one-fifth of the maximum. The temperature of the water is raised to about 140 deg. F. For a warm bath about half water from the cylinder and half cold water would be needed; for a hot bath the cylinder would be called on to yield two-thirds of the total.

The other system of water heating by gas is represented by the instantaneous type, commonly known as geysers, from which a steady flow of nearly boiling water is obtained within a few minutes of lighting the burners. These are dealt with in detail in a separate article. They are available both for local use, i.e. over a single basin or a bath, and for multi-point service. In the latter arrangement hot water may be drawn from a number of taps in different parts of the house, the opening of any water tap automatically setting the geyser in operation. A small pilot burner remains alight under the geyser and this ignites the larger heating burners as the automatic gas valve is caused to open by turning on the distant water tap. The instantaneous heater is suitable for multi-point service. A small water heater fitted over a sink is also handy. This automatically yields three gradations of hot water when the tap is turned, using gas only when hot water is running.

Electric Water Heaters. Water is heated electrically by means of a heating "element" enclosed in a tube. The element is fixed in the tank so as to be immersed in the water, and that all the heat generated is utilized.

Self-contained electric water heaters are made in various sizes suitable for all house-hold requirements, from the small 1½ or 2 gallon water heater, useful for supplying a wash-hand basin or sink *(see* Kitchen), to an installation of 30 or 40 gallons capacity capable of providing all the hot water required in the largest house. Fig. 3 shows an electric storage heater fixed in a bathroom.

In small houses where there is no undue length of hot water piping, it is possible to convert the present hot water tank into an electric water heater by fitting an electric thermostat and heater into it (Figs. 4 and 5) and by surrounding it with suitable packing of cork or other non-conducting material, so that the heat is not wasted when no water is being used. If the capacity of the hot water tank is at least 20 gallons, and the conversion work is carried out by experienced engineers, satisfactory results should be obtained.

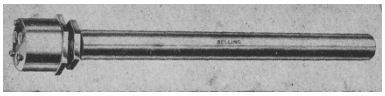


Fig. 4. Electric immersion heater for fitting into an existing hot water tank.(Courtesy of Belling & Co.)

The installation of an electric heater is a simple and inexpensive matter. Only a small amount of plumbing

is necessary, and the heater itself can be fitted at the most convenient point in the pipe line. In some cases the old heating system may be retained so that during the winter months when the fire or coke boiler must be lit the water heating is done by this method, the electric heater being automatically switched on when the fire dies down. This is a very economical method.

Oil-fired Boilers. When neither gas nor electricity is available, and it is not convenient to use solid fuel, it is possible to utilize an oil-heated geyser. Most of these employ a paraffin oil burner of the vaporising type. Oil fired independent boilers are extensively used abroad for domestic heating and hot water supply, and it is now possible to obtain automatic equipment of this kind suitable for the medium sized house. Heavy fuel oil is fed as a fine spray into the firebox of the boiler, where it is ignited and burns with an intensely hot flame. The pressure pump is electrically driven, and is controlled by a thermostat which, when the water reaches the desired temperature, switches off the pump motor and shuts off the fuel. Conversely, when the temperature falls the pump is set working again and the oil spray is ignited by an electric spark. The apparatus is entirely automatic and is silent in action.

Choice of System. The relative merits of the various systems must be determined by individual circumstances, but points for consideration are, that when the solid fuel system of the cooking stove is used, the fire must be adequate to meet all demands, irrespective of the temperature of the kitchen or the cooking requirements. The system works well when used in conjunction with a modern portable range, if only intermittent supplies of hot water are needed for baths, etc., and will furnish at other times plenty of water for washing up and similar purposes. The range may be adapted to burn coke, or anthracite coal, or otherwise arranged to remain alight over very lengthy periods.

There are several reasons why the older type of kitchener seldom functions satisfactorily or economically as a source of hot water supply. The boiler at the back of the fire absorbs a great amount of heat whether hot water is being used or not, and it has been estimated that this wasted heat may be as much as one third of that given out by the fire. The reader is referred further to the article on Range.

In choosing a water heater it should be borne in mind that, although gas and electric systems when properly installed cost little if any more to run than a coke fired boiler, it is important that heat losses by radiation from tank and pipes should be prevented. Unless the pipes, etc., are lagged with insulating material the cost for gas or electricity may be very largely increased. The hot water storage tank should be enclosed within a casing, and the insulating material packed in the space between tank and casing. Where the tank is situated in and heats an airing cupboard, the top of the tank may be left exposed, as this portion will give off enough heat for airing purposes. The space between tank and walls of airing cupboard may be filled with the insulating material, and no casing is necessary.

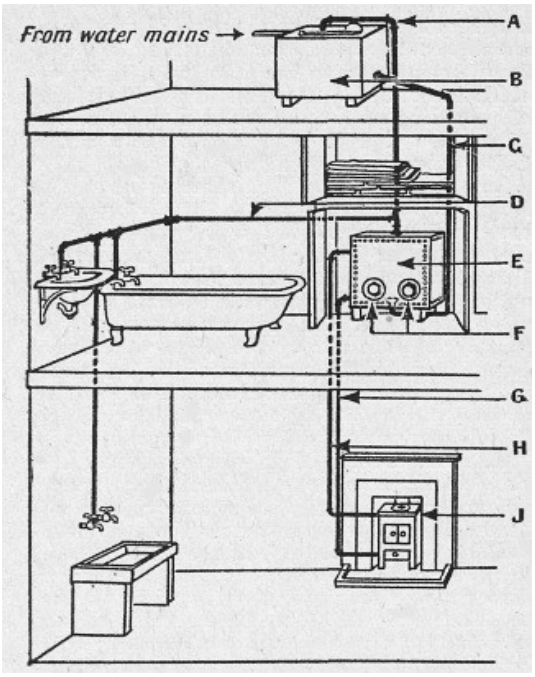
Tank or Cylinder. Fig 6 shows the arrangement of a hot water system as fitted to a solid fuel cooking stove of the ordinary portable type with a side boiler. This is known as the tank system, because a storage tank is situated above the highest level of the taps. In the cylinder system, the storage tank is below the level (Fig. 7).

Most hot water systems comprise a flow and return pipe, and to ensure that the hot water should rise always up the same pipe, the flow pipe is situated at the top of the boiler and the return pipe at the bottom. When a tap is turned on some of the hot water ascends from the boiler and some descends from the cistern, to flow out of the tap.

It is not difficult or expensive to convert a system utilizing the kitchen range to one employing gas or independent heating. It is merely necessary to disconnect the flow and return pipes from the cylinder to the boiler of the kitchen range, and connect them to those on the new heater. The boiler should be removed from the range and the space filled in with firebrick. This arrangement will be found to overcome most of the difficulties associated with the failure of the ordinary system as installed, otherwise immediate attention should be given to the flow and return pipes of the boiler and the hot storage tank. If the circulating pipes are choked up they will have to be cleared by one of the solutions sold for the purpose, or in bad cases the whole of the pipes must be taken down and cleaned out with a scraper.

Combined Heating and Hot Water Supply. As mentioned earlier, it is often possible to combine these services. There are several points to notice, however. If water were drawn direct from the central heating system (after circulating through distribution pipes and radiators) it would probably be found to be discoloured by the corrosion of the latter. In a system primarily designed for hot water supply, it may be possible to attach a couple of small radiators, and so warm rooms from the hot water boiler. The arrangement will only function properly in districts where the water is hard and does not corrode the interior of pipes, radiators, etc.

A central heating system intended to furnish domestic hot water also should have a boiler designed to that end. The water for radiators is drawn from an inner cylinder enclosed within the storage cylinder and connected to the boiler. The domestic hot water does not mix with that used to heat the radiators, but comes from the outer cylinder, being warmed by heat transmitted through the walls of the inner cylinder *(see* Fig. 8). A is the hot water flow, and B the boiler flow. C is the cold water feed and D the boiler return. E is plugged.



Hot Water Supply. Fig. 5. Diagram showing dual installation comprising coke-fired boiler and electric immersion heaters. Either may be used at will.
A, expansion pipe.
B, cold water storage tank.
C, cold water inlet.
D, hot water service pipe.
E, hot water tank.
F, immersion heaters.
G, cold water feed to solid fuel fire.
H, hot water return from fire.
J, solid fuel fire. (Courtesy of Belling & Co.)

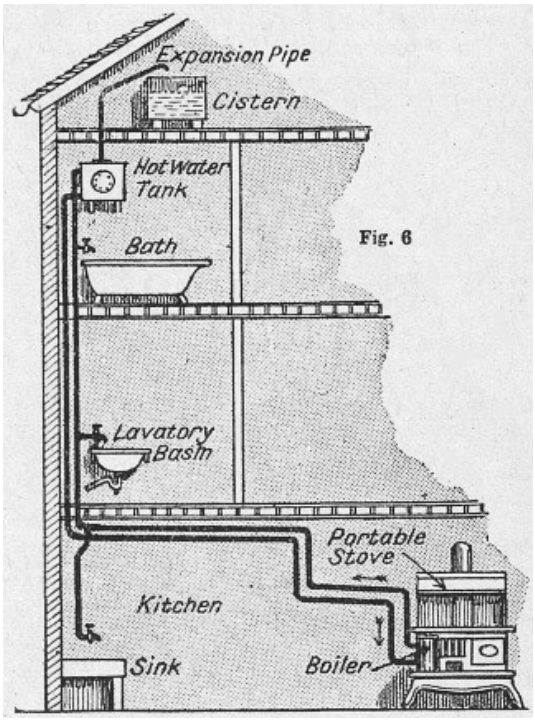


Fig. 6. Tank system of hot water supply fitted to a portable caoking stove with side boiler.

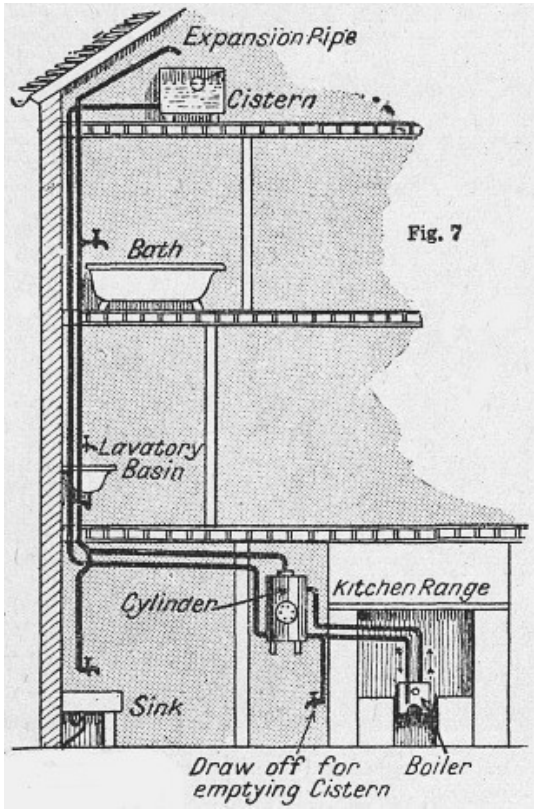


Fig. 7. Diagram showing cylinder system.

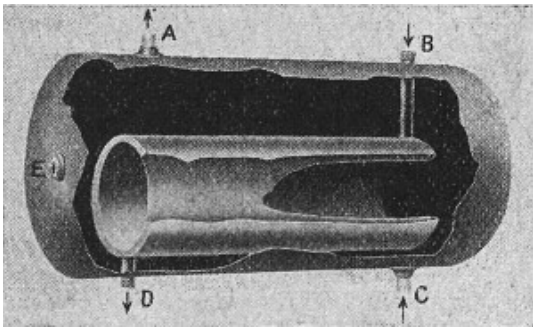


Fig. 8. Indirect cylinder used on combined central heating and hot water systems. (Courtesy of National Radiator Co.)

HOUR GLASS. An hour glass, or sand glass, as it is sometimes called, is an old form of timepiece, being planned to measure time. The early ones were made to measure an hour, hence the name, but afterwards others came into use for shorter periods of time. One consists of two glass bulbs fitted to each other at the narrow ends and having a tiny passage between them. Glasses used for eggs contain sufficient sand to pass from one bulb into the other in the time which is required to boil an egg. Hour glasses are sought by collectors, and good specimens are valuable. Some of the most coveted examples formerly stood in churches, being used to mark the length of the sermon. The glass bulbs were usually enclosed in a frame of wood, in some cases curiously and beautifully carved. Glasses of the same kind, known as log glasses, were used on board ship for measuring time. *See* Egg Boiler.



(*Hour Glass in silver gilt stand, c. 1590 (British Museum).*

THE HOUSE: ITS PLANNING AND CONSTRUCTION

With Important Legal Points Clearly Explained

Other important aspects of home-making are considered under Architecture; Bungalow; Cottage; Flat. Several hundred articles also deal with the building, repairing and furnishing of the home. These include Brick; Carpet; Colour; Decoration; Dining Room; Drains; Lease; Paperhanging; Roof.

A broad classification divides existing houses into three types, detached, semi-detached and terrace house. The first of these is only possible for most people where land is comparatively cheap. The semi-detached and terrace houses are the ones most frequently seen in towns, whether in the poorer or the richer quarters. The structure of terrace houses, even in the best neighbourhoods, shows at a glance that there land is costly. They usually have a basement and a comparatively narrow frontage.

The semi-detached house is a compromise between the two. The fact that one side is exposed enables the house to have a certain amount of land, even if it is only sufficient for a passage at the side, while there is an economy in building two houses together. The arrangement is convenient, too, where it is desired to build a garage beside the house.

A growing artistic sense leads more people to desire houses that are attractive to the eye, both externally and internally. To a large extent homes to-day are planned to save labour. Gone are the basements and some of the long flights of stairs; gone, too, are many forms of floor and window coverings and other furnishings that demanded constant attention, or, if left alone, were harbourers of dust. Light and air are allowed to penetrate to the fullest extent rooms designed to take advantage of them.

Period Styles. The builders of old days adopted ways that were always direct and real, arising out of local conditions and suited to these. Thus, when timber was plentiful there arose that manner of building which is called half-timber, i.e. having a stout oaken framework, with a filling of plaster, brick, or other material. This is essentially constructional work; modern imitations of the style fall far short of the original, the apparent timbers being merely on the surface, thin pieces of wood nailed to a brick backing, and having none of that solid look that real half-timber alone can produce.

In a later age, when brickwork came into general use, particularly in the eastern and southern counties of England, there was a new expression of building, exemplified in the Tudor style, and much later in the Georgian. Tudor houses were largely the product of craftsmen working in traditional ways of building; they were not houses built to any precise drawings, but rather the outcome of individual fancy and free craftsmanship. That is a point to bear in mind when a Tudor house is attempted to-day.

The old work has all kinds of variations in it; for instance, the brick walling is not meticulously exact, either in its surface or in its jointing, and the bricks themselves are full of variation and colour, and have a texture quality. These variations are often copied to-day with successful and artistic results. Window and door openings in the front of the house may vary in shape and size quite appreciably, while maintaining a general balance. To-day these are set out on the drawing-board, and while it is pure affectation to imitate some of the vagaries which sprang from the original craftsman's fancy, it is equally true that anything like mechanical precision in the work will inevitably produce a hard, unsympathetic-looking house. The quality of craftsmanship in house building cannot be too strongly commended.

In the Georgian style of building that was common in England throughout the 18th century it is seen that though design had then become very much more a matter for the architect than for the craftsman to determine, the houses of the period still exhibited a marked sense of craftsmanship. Within the last half century there has been general appreciation of the qualities which constitute the charm of our old houses. Anyone proposing to build a house to-day should have at least some little perception of these qualities, and so long as the essentials of good house design are kept in view and sound work is demanded in every case, there is the basis for satisfactory results.

Choice of Site. Soil and aspect are two important factors. The former is discussed at some length in the opening paragraphs of the article Architecture, which should be read in conjunction with the present one.

As regards aspect, an endeavour should always be

made in the placing of the house and in the planning of it to get as much sunlight as possible into the rooms. A room that gets no sun is not necessarily unhealthy, but it is distinctly less healthy and less pleasant than one that has been planned to get abundance of sunlight.

A living-room which is used for the best part of the day should have a sunny aspect, preferably facing south and west, while in a kitchen a north-easterly aspect is suitable. Bedrooms should be placed so that they not only secure sunlight, but also cross ventilation. In this connexion it may be noted that where ventilation through openings in outside walls is not possible, good results can be obtained by the provision of fanlights, which enable cross currents to pass from the outside air into the landing, staircase, and hall.

The combining of the kitchen and the scullery, provided that the room thus made is of a good size, making it into a proper domestic workshop, is a modern expedient that has great merit when a maid's sitting room is provided. Above all things space should not be saved on the kitchen quarters in a house, however necessary this may sometimes be in a flat. A kitchenette for family cooking is inadequate. The inclusion of a service hatch, with handy store cupboards adjadent, saves a great deal of walking to and fro in the serving and clearing away of meals. Consideration may also be given to the inclusion of built-in fitments. This applies both to rooms upstairs and down. In the dining room such features as a built-in sideboard and cupboards may be included; while upstairs commodious built-in wardrobes are excellent features.

Very desirable in the equipment of the bedrooms are fitments with hot and cold water services. These also can be built-in, preferably in an enclosed recess having a small outside window. Fitments of this land involve a good deal of expense, as plumbing is always a big item, and they mean long runs of piping. There can, however, be no question of their convenience and merits.

Dealing with the Architect. Some hazy notions exist as to what an architect actually does and what his fees are. Anyone desirous of getting precise and full information about this matter should apply to the Secretary of the Royal Institute of British Architects, 66, Portland Place, London, W.I, for a copy of the institute's professional scale of charges, the price of which is 3d.; but it may be of service here to set down briefly the chief items.

An architect's fees are 6 per cent, on the total cost of building on jobs of £2,000 and over, and on a sliding scale varying from 10 per cent, to 6 per cent, when from £100 to £2.000 is spent. This sum includes working out the scheme, making an estimate of the cost, preparing detailed drawings and specification, arranging matters with the builder, issuing certificates, and generally supervising the erection of the house, assuming this is within a reasonable distance. If the job is far away, extras must be incurred for travelling, out-of-pocket expenses, and time occupied.

The benefits of calling in an architect are that the best possible advantage is taken of a site and that many labour-saving ideas may be introduced into the building that are practical and inexpensive in themselves and the ultimate means of saving cost of living and ensuring comfort.

The remarks on page 62 regarding builders' tenders and the arrangement of contracts may usefully be referred to. Assuming tbe job to be proceeding normally, the builder would ask for payment on account from time to time, and the architect, having satisfied himself that the work had been carried out to his drawings, would approve these payments to be made in due course by the client. The drawings, specifications, and other documents relating to the house remain the architect's property, but it is a customary arrangement for the client to have copies of the drawings for his own private use on payment of an agreed fee.

Brick or Stone. The question of the materials to be used for the construction of a house is influenced by local conditions. The golden rule is that what is native to the soil is right; that is to say, a stone house is right in a stone county, as, for example, in the Cotswolds or in the Yorkshire dales, just as brick and tiles, or weatherboarding and thatch are of the soil and right for many districts. A well-designed house that would quickly look at home in old-world surroundings where thatched roofs are to be found is shown in our first illustration. There are two or three points about a brick house that should be noted. If it is proposed that the brickwork shall be exposed on the face, then it is imperative to use a good brick, one with not too smooth a surface, and with a play of colour in it. Attention should be given to the jointing. In some kinds of houses, more especially those which follow the freer style of the Tudor, walling with thick mortar joints looks best, the mortar being wiped off flush with the trowel; but in a house of Georgian character a finer joint is more suited to the design, and if struck in cement it gives a thoroughly watertight result.

Exterior Details. The details of house design are so numerous and diverse that no attempt to deal with even a tithe of them can be made here. A few points, however, may be noted. Take, for example, the front entry. It is most desirable that this should have some sort of protection either in the form of a hood or of a porch. Neither of these structures need be cumbersome.

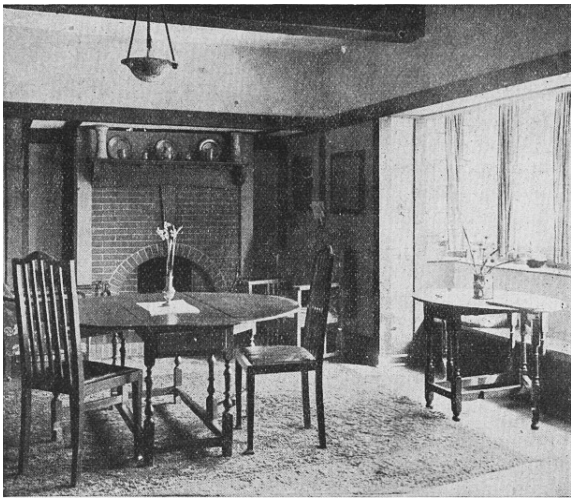
There are old houses up and down the country dating from 100 years and more ago which have quite slender hoods, lead-covered, and supported on delicate brackets, and the fact that they are still sound to-day after so many years of exposure is proof that a cumbersome hood is not needed.

The colour used for painting outside woodwork and plaster is another point worthy of remark. Drab and dirty colours should be eschewed. For a house in the country nothing looks better than deep cream for

plaster work, and the colours chosen for the front door, gate, window frames, etc., should be in pleasant contrast to the surrounding landscape. Vivid shades are more suitable for town terrace houses, where the surroundings are dull. Thus, if a stucco house is painted cream the door and window frames may be painted light green, red, orange or blue without risk of providing a violent or unpleasant contrast, provided that it is in some harmony with the houses on either side.

Painting is a considerable item in upkeep, and it may be considered desirable to eliminate it as much as possible; as, for instance, in a house which has brick-framed windows filled with leaded lights in steel frames that are built-in; oak doors that can be safely left to look after themselves; and eaves formed of tiles in projecting courses set in cement. Such a house involves practically nothing in the way of paint cost for maintenance.

Interior Design. As with the exterior, so with the interior: there should be good design and sound workmanship. Above all, it is essential not to attempt make-believe, not to introduce features which, however appropriate in a baronial hall, are ill-suited to a little place perhaps not 10 ft. square. Take, for example, the matter of fireplaces. These are frequently incongruous. In the majority of cases a simple mantel enclosing a hearth fire is all that is needed, with perhaps a panelled picture or a mirror on the chimney-breast above. In a room of average size this will be a far more satisfactory arrangement than the introduction of a pretentious chimney piece.



Dining room, showing the brick-arched fireplace and the panelling effect produced by broad oak-stained splats, which also serve in place of a frieze banding, running in an unbroken line round the room.

In this matter we suffer from the exploitation of what is called the Jacobean style. It should be realized that many things perpetrated in that name are not Jacobean at all, and even if they were they would have no proper relation to our own day. The Jacobean style, if we may so call it, was evolved in the first half of the 17th century, and was a mingling of the then new Italian manner with the lingering Gothic tradition. In the original work it is interesting, as any genuine old work is, but to copy all its quaintness, and to do so in a mechanical way according to standardized factory models, is often merely to produce travesties. Something simpler and more direct, as indicated above, is what we should seek to attain.

As a finish to the house walls, distemper is excellent, especially for a house that has been newly built, for every house must have its time to dry out, and this may take the best part of a year. For this reason it is always preferable to distemper a new house, even though the walls may ultimately be papered.

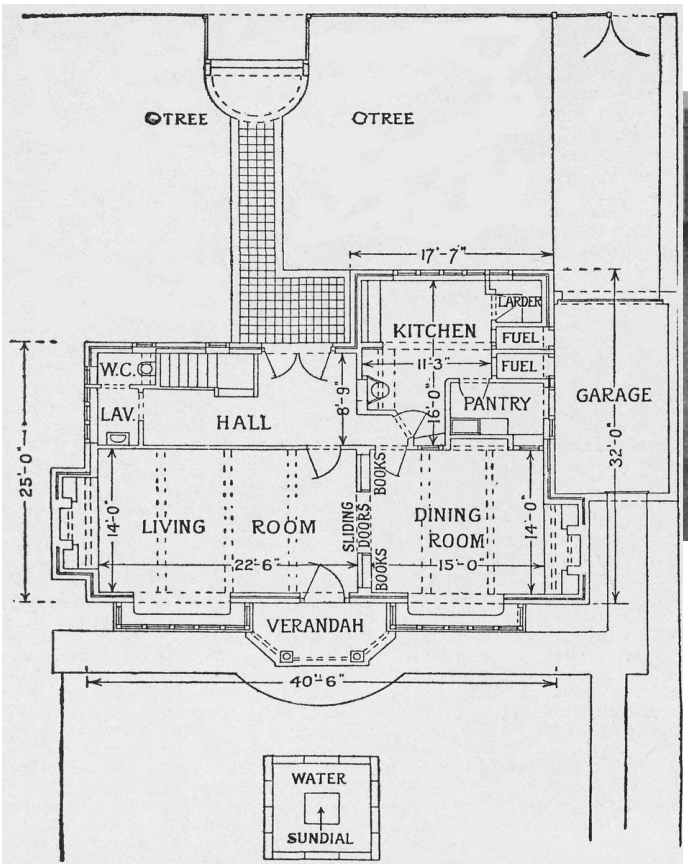


House. Dining room and living-room of the house described in the previous pages, showing how sliding partitions run into the bookshelves and thus avoid the disadvantages of clumsy folding doors.

Floors offer a wide range of choice, from deal boarding to parquet, and from jointless composition floors to tiles and rubber floorings. For the service quarters and passages there is linoleum, which should be inlaid and not surface printed, to withstand long wear. The following point, however, should be noted about linoleum: if ground-floor rooms are tight-covered with it, there is a risk of dry rot being set up. The risk is small, however, when the floor is well ventilated underneath.

The Plan. The house shown in the plans and the accompanying photographs is an example of the excellent results that can be obtained by intelligent and close co-operation between owner and architect. It has some interesting and ingenious features, a number of which were worked out by the architect at the owner's suggestion. It occupies to full advantage a comparatively small site in a seaside town. As the plans show, it is of an oblong shape, a form which has many advantages in a house of moderate size. This shape involves a somewhat large frontage, but the present relative cost of land and building, especially in the smaller country towns, makes larger frontages more economical than formerly. In a house of this type an extra outlay upon land of £25 would, by reason of the

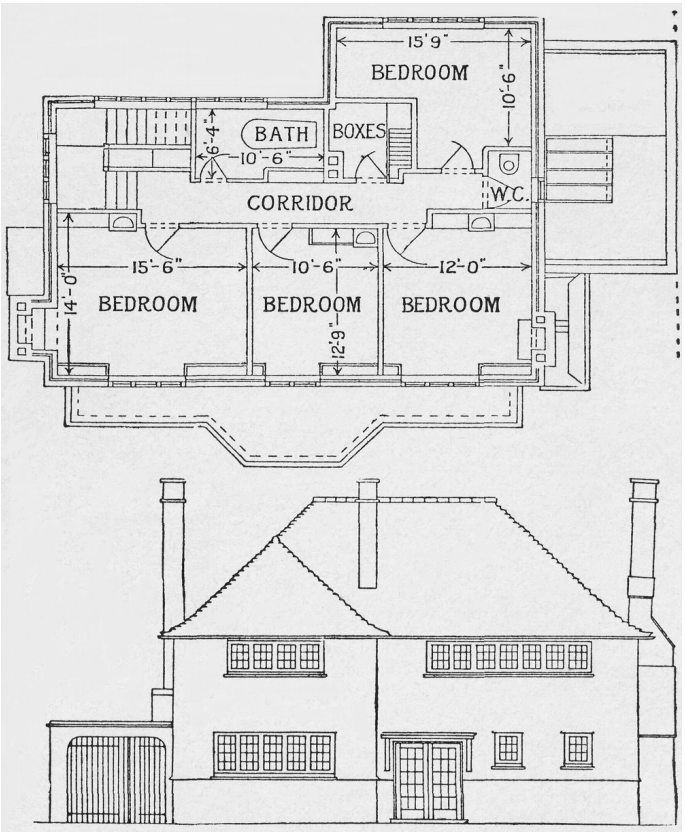
(Continued in page 1094)



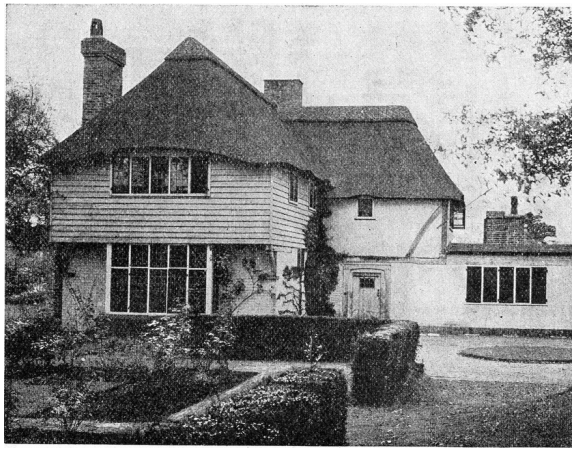
House. Left. Ground-floor plan and indication of garden of the modern house illustrated below.



House. South elevation of a well-planned modern house. It is of oblong shape and the exterior is of brick, the upper half being finished in roughcast. Casement windows form square bays on the ground floor continuous with the roof of the brick-floored loggia porch. The upper windows have deep-cut sun louvres which keep the rooms cool notwithstanding their southern aspect. (*Designed by H.M. Potter. L.R.I.B.A.)*



Left. Top, first-floor plan; note the large cupboards and basin fitments in bedrooms. Bottom, north elevation, showing front entrance and kitchen premises, leaving the southern aspect for the living-rooms.



Above. Charmingly designed house at Byfleet, showing the modern use of thatch in conjunction with weatherboarding and plastered brick walls. The upper storey projects over the lower one. (*Designed by G. Blair Imrie and T.G. Angell.)*

more attractive planning thus permitted, add quite £100 to its ultimate value.

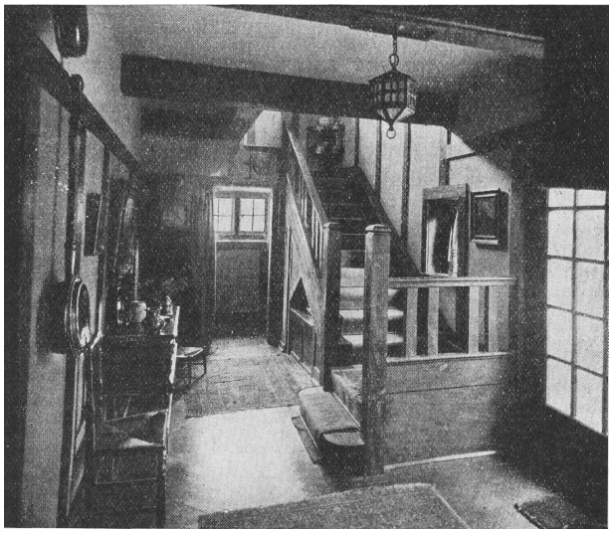
The basis of the design is the continuous dining room and large lounge living-room, separated by sliding doors which run into bookshelves. The two rooms can thus be thrown into one without the disadvantages and awkward appearance of folding doors, while the dining room portion is easily and completely separated from the living-room in winter, or at any other times when desired. On either side of a built-in sideboard in the dining room are service hatches, one opening directly into the kitchen, and the other into the scullery, so that the dishes are in one movement placed ready for washing up immediately the meal is finished. The fireplaces in both rooms are set in brick arches with raised brick hearths. Both rooms are well lighted with five leaded casement lights, built out to make roomy and comfortable window seats, the proportions being carefully designed. The space between the two bays is utilized for a brick-floored loggia porch, supported on two concrete columns with a flat lead roof continuous with the roofs of the two bays.

An excellent panelling effect is obtained by the use of broad splats treated to give the effect of dark oak. It will be noticed that the splat which is carried round both rooms in the place of a frieze runs exactly along the tops of the square window bays and of the fireplace, so that a continuous and unbroken line is given. This idea of panelling with broad splats and continuous frieze lines is carried out throughout the house, the obvious difficulties in hall and staircase being ingeniously overcome.

A warm colour effect is obtained throughout the interior by the use of sunny-coloured distemper for panels, and a lighter shade for ceilings and friezes. The staircase is particularly well designed, having a very easy rise. There are 16 rises 7 in. wide with 11 in. treads in a total height of 9 ft. 3 in. from hall to upstairs landing; the treads are 3 ft. 2 in. wide. The main flight is kept down to 10 rises by disposing of the remaining steps as follows, two reaching the landing at the bottom, one on the half landing, and three in the thickness of the upper floor and beams.

The Bedrooms. Four bedrooms, including a maid's room, are provided, with a bathroom and boxroom. Each bedroom has two ample cupboards built-in on one wall, with space between, which is occupied by a hand basin with hot and cold water; a convenience which greatly reduces the amount of work to be done by the maid in the bedrooms. On the opposite wall two wardrobe cupboards are built-in to provide recesses for casement windows, which open inward for easy cleaning. All windows are casement with leaded lights. Those in the bedrooms have outside shutters with exceptionally deep louvres, giving wider spacing and effective shelter from rain and light. Two of the rooms have brick built arched fireplaces similar to those downstairs.

As will be seen from the plans, practically all the rooms, both ground floor and first floor, face south, only hall and kitchen downstairs, and bathroom and one bedroom upstairs, being on the north side. The kitchen has no range, but in its place are supplied a large gas stove and an independent stove for hot water supply to bedrooms and bathroom. Both these are placed under a canopy communicating with the chimney, an arrangement which ensures the removal of all fumes from the kitchen. Spare heat from the back of the independent boiler may be allowed to pass into the hall through a low arched opening.



House. View of hall and stairs in the house illustrated in the previous pages. The staircase, which is in oak, is cleverly designed to give an easy rise, and is a decorative feature. Like the rest of the house, the hall is beamed and the panelled effect of the walls is carried out here also.

Legal Considerations. He who proposes building a house must first of all secure the land. He may either purchase or rent a piece of freehold or leasehold land. In either case the contract should be in writing signed by the seller or landlord.

It is usual on the sale of land to have a formal contract drawn up by solicitors, and the solicitor for the vendor inserts many provisions by which the purchaser, to save expense, is to waive his objections to various points in the title.

When anyone is about to purchase land, whether freehold or leasehold, and the solicitor for the vendor asks him to sign a contract containing a number of clauses about the title in advance, he should take it to a solicitor for investigation. After the title has been investigated the land must be conveyed by a deed under seal.

Building sites can also be secured on lease for a ground rent, particularly in the neighbourhood of London. Sometimes, in addition to the ground rent, a lump sum or premium for the land will have to be paid. In some cases the landlord rents the land to the lessee, who covenants that he will put up a house within a certain time. In other cases the lessor enters into an agreement that if the lessee will put up a house on the land named a lease shall be granted to him after the house is put up.

There is a great deal of difference between these methods if the lessee is unable to carry out his bargain, for if a person partly builds a house on land of which he has not yet got a lease, and then is unable to carry on, the owner of the land can take possession of the land again and confiscate whatever has been put upon it. If, however, the lessee has actually got a lease of the land, he will probably be able to get somebody else to finish the house on terms, or to transfer the land with the house partly built at a price sufficient to cover most of what he has spent upon it.

In nearly all cases the lease contains a clause that the lessee shall erect the house or houses of at least a certain value upon the site, such value to be prime cost of labour and materials. In very many cases also, the plans must be passed by and the work done to the satisfaction of the landlord's architect and surveyor. This means that it is to be done to the "reasonable" satisfaction.

The purchaser of a site should make sure what restrictions there are upon the use to which the land may be put. For instance, he may be prohibited from building a shop.

The next thing is to make a contract with a builder. The intending house-owner may get an estimate from the builder and submit it to an architect. He will do better still to employ an architect to make a plan of the house and obtain tenders from several builders. Builders always make specifications, i.e. detailed estimates of buildings, showing what they intend to put into them, and conclude with a statement of the prices to be charged. If something which is not in the specification is required, it will become an extra, for which the builder may charge a reasonable sum.

Payment of the Builder

When a tender is accepted, it should be subject to the builder entering into a written contract drawn up by a solicitor or by the architect. This ought always to contain a clause that the builder is not to be paid unless and until the architect certifies that the work has been properly done. An architect who has to certify in this fashion must give his certificate honestly. Most building contracts stipulate that the builder shall be paid by instalments; so much when he has cleared the site, so much when he has put in the foundations, so much when he has built the walls, and so on, the amount generally being calculated at, roughly, two-thirds the value of the work done.

A date for the completion of the work may be fixed and for every day beyond that time during which the building is not finished the builder may be required to pay a penalty. Other clauses ought to be that if the builder is unable to carry out the work to completion, the employer may take it over and employ another builder to finish it, and only pay the first builder for what he has actually done.

Care should be taken not to order extras, for this will get rid of any stipulation as to time of completion. It is best to have a clause that no extras shall be put in by the builder unless they are ordered in writing. If a substitute of one thing for another is suggested, and the owner does not intend to pay extra for it, he should make it perfectly clear to the builder in writing that the substitution is to be effected without extra charge or delay in the work.

No house can be built except according to the requirements of the local authority with regard to the materials to be used, the drainage system and the like. All plans have to be passed by the local council, and once passed the building-owner must not deviate from them without the consent of the council. The drainage system must also be inspected before it is covered up.

When building, the owner should be very careful not to interfere with his neighbour's ancient lights, or he may find himself involved in legal proceedings.

When a person builds upon a plot of land which is his freehold, the land and the building are his for ever; but if he builds upon leasehold land, at the end of the lease the house and everything on the land revert to and become the property of the freeholder from whom he held his lease. Moreover, building leases usually contain stringent clauses that the lessee shall be responsible for the repair of the house and for painting and the like. These covenants are not very strictly enforced by the landlord for the first part of the lease, but as the lease draws near to its conclusion the holder of the lease will find himself frequently subjected to requisitions by the landlord to carry out considerable repairs.

Buying a House. Every contract for the purchase of a house, whether freehold, leasehold, or copyhold, must be evidenced in writing signed by the party to be charged. To this rule there is one exception, that is if a contract for the sale of a house has been partly performed in such a way that the parties cannot really be put back into the same state again.

In making a contract to buy a house, it is well to employ a solicitor, because such contracts very often contain clauses which have a bearing upon the title which is to be accepted by the purchaser. Particularly is this caution necessary when buying a house at an auction sale. There is always a set of conditions of sale, which are sometimes printed and circulated in the auction room. Anyone who purchases a lot has put in front of him what amounts to a contract to buy the house subject to the conditions, and it is well to have a solicitor to see these conditions.

Contracts for the purchase of a house invariably contain a stipulation that the completion of the purchase, i.e. the execution of the conveyance and the payment of the money, shall take place on a certain date. If, however, the vendor or the purchaser is not ready on the exact date the contract does not go off, but an allowance must be made always of interest to the vendor and sometimes of the rent and profits of the land to the purchaser.

When the contract has been made, the next thing to do is to investigate the title of the vendor, which is done exactly as in the case of a sale of land, and should always be done by a solicitor. The next thing is the con-

-veyance, which should also be prepared by a solicitor, and is always by deed.

The lease should be examined. If there are repairing covenants, it should be observed whether they are very onerous or fairly light. Notice should be taken of any restrictive covenants. Suppose that Brown contracted to sell Jones a leasehold house. Jones is not obliged to take it if, on looking at the title, he discovers that there are any restrictive covenants upon the use of the house or the land—e.g. forbidding it to be used as a hotel or boarding-house—unless Brown told him beforehand that there were such covenants.

Obligations of the Leaseholder

The purchaser of a leasehold house is bound to covenant in the purchase deed to indemnify his vendor against all breaches of covenant. This means that he undertakes to pay the rent and carry out the covenants contained in the head lease, and that if he does not do so, and the lessor compels his (the purchaser's) vendor to make it good, the purchaser will in turn make it good to the vendor. The original lessee of a leasehold house for, say, 99 years is responsible to the landlord for the payment of the rent and the performance of the covenants during the whole 99 years of the lease, although he may have assigned (i.e sold) the lease to somebody else, and it may have passed through some fifty hands.

But an assignee of a lease is only liable for such breaches of covenant as occur while he is the holder of the lease himself. For example, X grants a lease for 99 years to A in the year 1900. In 1910 A assigns it to B. In 1915 B assigns to C, and so on until in 1998 the then owner assigns to Z. The lease contains a covenant to keep the house in repair, and in 1998 X finds the house in disrepair. He can sue A and A's heirs and executors or he can sue each person who has held the lease in respect of the disrepair during his period.

Before buying a house, whether freehold or leasehold, it is well to have the drains examined by the sanitary inspector or to employ a surveyor to do it.

On the conveyance of a house, stamp duty must always be paid on the conveyance, varying according to the amount of the purchase money.

Taking a House. A tenancy may be either under a lease for a period of years fixed or a tenancy from year to year, or from quarter to quarter, month to month, or week to week. A contract to let a house must be in writing; but the letting as apart from the contract to let need not be in writing, unless it is for three years and upward. This means that if A goes to a landlord or a house agent, and he verbally agrees that he will let him a house on a yearly or monthly tenancy, and afterwards refuses to carry out the contract, A cannot sue unless he has some acknowledgment of the contract in writing signed. But if he lets A into the house, and an actual tenancy has begun, A is not obliged to have any writing to prove what the terms of that tenancy are.

At the same time, it is better to have the main terms written down. These main terms are: the rent, the nature of the tenancy, whether quarterly, monthly, or weekly, and the notice required to terminate same.

In entering into the more formal agreements of tenancy by written agreement or by lease, the householder should always be careful to see that the document really contains all the terms, for otherwise the landlord will not be bound by them. This should be specially noted with regard to repairs, for it is one of the peculiarities of the English law of landlord and tenant that nobody is bound to do any repairs except by agreement.

Grounds for Annulling a Lease

Another thing a tenant should always be careful about is to stipulate that if the house should be accidentally destroyed, or rendered uninhabitable, except by his (the tenant's) own fault, he, the tenant, shall not be bound to go on paying rent for it. In the absence of such a stipulation, a tenant is bound to go on paying rent for the house so long as his tenancy has not come to an end by lapse of time or due notice, even if not one brick should be left upon another.

In leases for more than three years, it is usual for the tenant to agree to do the repairs. The most reasonable kind of repairing covenant is a covenant to keep the house in good and tenantable repair and condition. This means that the house is to be kept in such a state that a reasonably minded tenant would accept it to live in. What is reasonable in this connexion depends upon the class of house, neighbourhood, and the sort of tenant who might be expected to want a house of that kind.

If a tenant agrees to keep a house in repair and does not do so, the landlord may make him pay whatever it would cost to put the house in repair according to the covenant. It is also usual for landlords to insist upon the insertion in their leases of a proviso for forfeiture and re-entry. This means that if the tenant breaks any of his covenants, the landlord can put an end to the lease and forfeit the remainder of the term which has to run. A landlord cannot enforce such a forfeiture without first giving the tenant notice of the breach of covenant complained of, and requesting him to remedy it, and to pay compensation for the breach if compensation is required.

To this rule there are some exceptions. For instance, if the landlord is entitled by the terms of the lease to forfeit the tenancy if the tenant does not pay his rent, he can forfeit the lease without notice. But in this case the tenant can always escape the forfeiture by paying his rent and the costs up to date.

So also, if a landlord has given a tenant notice to do certain repairs and he has not done so, and the landlord consequently brings an action to recover possession of the house, the tenant can at the last moment come to court, offer to do the repairs, and have the case stayed for a certain time to give him an opportunity to perform his obligation. Then, on paying the costs to which the landlord was put, he is relieved of the forfeiture.

Subletting. Unless there is an agreement to the contrary, a tenant may always assign his tenancy or sublet the premises or any part of them. But it is quite common for landlords to insist upon a clause in the lease that the tenants shall not assign or sublet without the landlord's consent.

Wherever such a clause appears the law always assumes that it is qualified by the words: which consent shall not be unreasonably withheld in the case of a respectable and responsible tenant. The tenant who encounters an unreasonable refusal can bring an action asking the court to declare that the landlord's refusal is unreasonable, and if the tenant proves his case the landlord will have to pay the costs. It is not reasonable for a landlord to refuse his consent to an assignment or subletting on the ground that he, the landlord, happens to want the premises for himself.

HOUSE AGENT. House agents are middlemen who bring together those who have houses to let and those who wish to rent them. Many of them are also auctioneers and valuers. A house agent charges a fee or commission for the work done. If he lets a house, he charges the owner a percentage on the first year's rental, 5 per cent being the usual charge. The tenant pays nothing.

The house agent lets furnished flats on about the same terms and collects rents for persons on commission, 5 to 7½ per cent on the amount collected. If he is an auctioneer and valuer he will sell and value goods, 5 per cent on the amount collected being usually charged. House agents also sell houses by auction or by private treaty. *See* Agreements; Furnished House.

HOUSE DOG. Some breeds of dogs are suitable only for the house. Among these may be mentioned most of the toy varieties and all which come under the heading of lap dog. Sporting breeds, however, often make excellent house dogs provided that they are given sufficient exercise and otherwise kept in good condition. The smaller terriers are universal favourites, English, Scottish or Aberdeen, and Irish. Their house manners are admirable, and they enjoy their privileges as family pets; but persons adopting them as such must be prepared to give the dog at least one good walk a day, and must not imagine that it is sufficient for him to be taken the round of the shops.

Most of the larger breeds have excellent qualities as house dogs, but their size is a drawback except in the larger houses. Great Danes, wolf-hounds, setters and St. Bernards, occupy considerable room in a small house, and even the Airedale is at a disadvantage in this respect, though as a family pet he is a great success. It is, however, not difficult to make a house pet of any breed. *See* Airedale; Dog, etc.

House Fly. *See* Fly.

HOUSEHOLD BREAD. This term is used to describe loaves that are moulded in two parts like cottage loaves. They differ from the latter, however, in that both parts are the same size, or the top slightly larger than the bottom. They are packed closely together in the oven so that there is crust on top and bottom only. *See* Bread.

HOUSEKEEPER: Her Qualifications. There are various openings for the trained housekeeper who takes up this work as a means of earning a livelihood. A great advantage of this calling is that if a girl marries she reaps the full benefit of her training, and can always return to the work in case of adversity or widowhood. It is also often the best opening for the woman no longer young, and proficient in running a house.

This last type of woman, untrained but with years of practical experience behind her, will most easily find a post in a private family, either supervising a maid or maids, or in many cases undertaking the cooking herself.

For housekeeping work on a larger scale, such as that in a hotel, boarding-house, hospital, school, or other institution, training is almost always necessary to give the requisite knowledge of catering and cooking, the science of domestic economy, the management of staff, accounts, and the care of linen. Even if the housekeeper has no cooking to do as is probably the case in an institution, it is essential she should know the subject in order to be able to supervise the cook and check waste —a very important point in a large place. Cookery and domestic management generally may be learnt at many domestic science centres in all parts of the country, courses varying from 6 to 12 months. Salaries are now excellent in this kind of work.

The woman who intends to earn her living as a housekeeper, besides having the technical qualifications mentioned, must be willing to take responsibility, should be enough of a teacher to direct assistants clearly, and must have sufficient tact and personality to get on well with the variety of people who live under one roof in any institution. *See* Servant.

HOUSEKEEPING: MODERN METHODS
Advice on the Management of the Home

The reader may also consult the articles Accounts; Clothes; Cooker; Diet; Food; Furniture; Kitchen; Labour Saving; Larder; Laundry; Linen; Mending, Refrigerator; Servant; Spring Cleaning; Table Laying; Vacuum Cleaner.

The woman who has to save her pennies usually goes out marketing herself. The economy of buying over the counter and paying on the nail is undoubted, and she obtains the advantage of variety for the daily menu. All large stores have bargains in food just as they have in dress. An abundant supply of salmon, a large consignment of asparagus or of strawberries or oranges, sufficiently inexpensive to encourage jam and marmalade making, lobsters, ducklings, and other luxuries at the price of commonplace foods, are the

reward of those who look for them.

If there is room in the home for a store cupboard, it will prove an economy. Soap and candles, for instance, harden with keeping, and do not waste as new soap and candles will when put into use; rice and other commodities of this kind are cheaper if bought in bulk, and in all such and other cases, as there are several prices for different grades of the articles, personal shopping tells advantageously. It is well to have in reserve a few emergency commodities of which the kitchen may run short at a critical moment.

In these days of informal entertaining it is also most useful, whether living in town or country, to have an ample provision of bottled or tinned soups, fruits, and vegetables. Those who are fortunate enough to possess large kitchen gardens are sure of supplies, either fresh or home-bottled, for the extra vegetable or fruit course that will supplement the menu in the event of an unexpected guest; others should have no difficulty in doing this if they keep a certain number of tins of vegetables and fruits in the store cupboard. Such vegetables are easily and quickly prepared, and if reliable brands are purchased they make safe and varied additions to meals. Beetroot, tomatoes, asparagus, peas, beans, and corn are a most useful selection of tinned vegetables. Pineapple, grapefruit, cherries, loganberries, peaches, apricots and pears, either bottled or tinned, will furnish the chief ingredients for many kinds of sweets. Sardines and other tinned fish, tongue, sausages and potted meats may be stored at the housewife's discretion according to her likely requirements.

Importance of Early Training

A point that the really capable housewife who likes to do everything herself often overlooks, and that the undomesticated mother minimises the importance of, is the value of early training for girls in good housekeeping. It does not matter what a girl is going to be or do in after life, she is handicapped unless she really knows how to keep house. This does not mean a return to domestic slavery, but the emancipation of taking a live interest in the things she ought to know. On no account should good housekeeping be presented as drudgery, but as a real and exciting achievement. Nearly all children, often boys as well as girls, delight in a cookery afternoon— arranged for them preferably when the cook is out—and not only to be allowed to make toffee and other sweets, but to concoct a whole menu or prepare the dishes for Sunday supper.

Pleasure in doing this is chiefly a matter of clever suggestion. Many girls have been turned against domestic accomplishments for life by being forced to do housework, needlework, or cookery as very dull lessons, instead of having all these things made to appear so interesting that they ask to be allowed to do them, as they will ask to do gardening or painting. Just as children are taught to put away their playthings, so they can be taught to clear up after cookery or any other domestic pursuit. Equally important is it to see that things are done in the right way from the beginning instead of allowing wrong or slipshod habits to be acquired.

Well-balanced menus are the aim in good housekeeping. Diet is now a matter which is more scientifically considered, and the old haphazard method of choosing meals no longer satisfies the careful housewife, who wishes her family to live on a dietary capable of producing the best results of physical fitness. The most important department in housekeeping is the provision of proper food, which includes not only its purchasing and cooking, but also its serving in an appetizing way.

Business-like Methods. If there are books to pay, it is better to have them sent in weekly than monthly. All the slips sent by the butcher and fishmonger with their goods, stating the weights delivered, should be kept for reference after the goods have been weighed and the books checked.

Women who like to manage the family exchequer in a business-like manner prefer a certain sum of money to be placed quarterly or monthly to their own banking account, and it is generally understood that any surplus that accrues goes to pay for breakages, to renew the stock of household linen, and so forth. The sums for servants' wages and the dress allowance of wife and children, if paid to this account, simplify matters considerably. When it is neither possible nor desirable to follow this plan, so much a week may be paid to the housewife for marketing and current expenses. Every item should be entered in a book as paid for and the money made to balance daily or weekly.

In domestic management a time for everything and everything at its proper time is a good rule. Kitchen orders given at the same hour each day and regular supervision in cleaning processes create between mistress and maid the reciprocity that makes for harmony and efficiency in the home. Any labour-saving inventions that have been tested and approved will help the smooth running of the establishment. The mistress who takes pains when changing servants to engage those with a good personal character is the one who, in the long run, saves herself trouble. It is well to remember, however, that even the least experienced of maids may be trained, if willing, into a valuable help when the mistress is herself an adept at cooking and domestic economy in general.

House pride goes naturally with good housekeeping. The woman who possesses it in full measure takes a personal joy in cleaning and polishing, in making her glass sparkle and her silver shine. There is, again, a great feeling for beauty, and an orderly, well-arranged home is one of its best expressions.

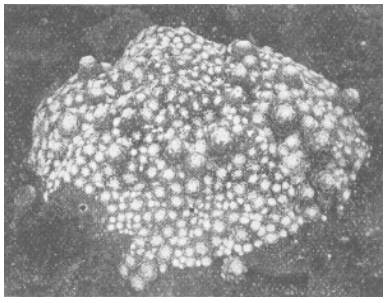
It is good economy to replace glass and china as it is broken, thus preventing the necessity of buying a complete outfit in course of time, or of using pieces that do not match. The wise housewife to-day does not hoard. She has too great a sense of the value of space-saving to lumber up the home with useless articles.

A periodical attention to the linen cupboard and personal underwear of the household is another necessary duty, so that gaps in supplies can be filled as they occur. In this connexion a careful scrutiny should be kept of what goes to and what is returned from the laundry; and the plan of putting away all napery and lingerie at the bottom of its pile, instead of at the top, should be observed, so that each item may be used in its turn, thus preventing the premature outwearing of one or two.

The housewife who prides herself upon all-round efficiency makes a point of being a good hostess. This can be achieved without much expense owing to the simpler standard of entertaining. Short meals and light are the rule, costly wines are not looked for, but attractively laid tables, good cooking, well-made tea and coffee, appetizing little extra dishes, and the consideration of individual tastes are what constitute successful housekeeping from the angle of the visitor.

HOUSELEEK. The houseleeks, of which the botanical name is sempervivum, form rosettes of thick, fleshy evergreen leaves; these when well developed produce spikes of flowers, chiefly of reddish or yellowish colouring. After having flowered the rosette dies, but propagation is easily effected by detaching small pieces or offsets, which develop freely. Houseleeks will flourish in rock crevices, on house roofs, and in walls, and need little or no soil, though when planting a little soil should be pressed round them.

Some of the houseleeks have most ornamental leaves; the most distinct is the cobweb houseleek (arachnoideum), with a white cobweb-like covering to the leaves, which ought to be protected in winter by a covering of glass if the plant is grown out of doors; it makes an excellent pot plant for the cold greenhouse. Others are the red-leaved houseleek (triste), hen and chickens houseleek (globiferum), calcareum, with reddish brown leaves, and the common houseleek (tectorum). The Madeira houseleek (tabulaeforme) is sometimes used as a summer edging to flower beds: the plants must be lifted in autumn and stored under glass for the winter.



Houseleek. Rosette-like leaves of the houseleek; it flourishes on a roof, in a wall or on rocks.

HOUSEMAID. The most important part of a housemaid's duty is regular sweeping and dusting, as well as the periodical turning out of rooms. This includes the cleaning of the grates and the lighting of the fires. She is also responsible for calling the household, distributing hot water, early morning tea, etc., making the beds and doing up the bedrooms, and preparing the bedrooms at night.

In large houses where a first, second and perhaps third housemaid are kept, they will divide these duties between them, as they will where there is a housemaid and an under-housemaid. In smaller ones the housemaid may be expected to lay the table and do some of the washing-up. In many households the two servants kept are the cook and the housemaid. In such cases they divide the household duties between them, the housemaid doing practically all outside the cooking and the care of the kitchen. In many situations she will be expected to do some of the mending, and may also have charge of the linen; but such duties should be stipulated for when she is engaged.

Housemaids, like other servants, should be insured under the national health scheme, and also against accidents that may happen to them in the course of their work. *See* Insurance; Parlourmaid.

HOUSEMAID'S BOX. This receptacle for brushes, rags, polishes, and other things necessary for cleaning up ashes, laying fires, polishing grates and similar work can be carried from room to room, and the lower part of the box is reserved for the ashes, which can thus be conveyed to the dustbin, or wherever else the refuse is put. The top of the box is fitted with a tray in which there are compartments for brushes and other utensils.

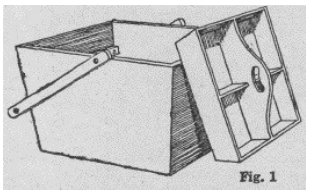


Fig. 1

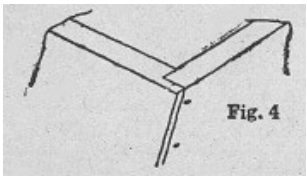
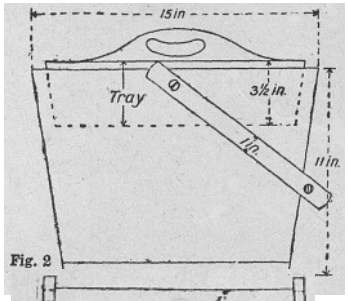
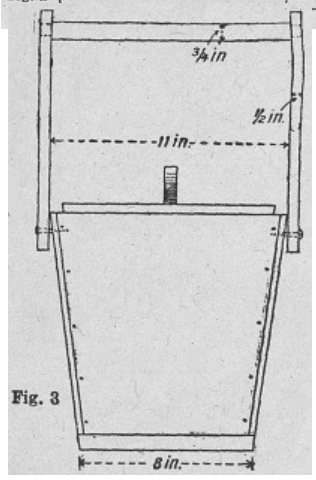


Fig. 4





Housemaid's Box. Fig. 1. Compact receptacle with tray for grate-cleaning requisites. Fig. 2. Side of box, with measurements.

Fig. 3. End in section, showing method of attaching handle.

Fig. 4. Sides joined by a rebate.

Fig. 1 shows a box with a movable tray. The main box is made from ¾ in. deal, and the tray from ½ in. deal, and involves no elaborate jointing. The four sides of the box should be first cut from a 10½ in. wide board to their full length, and as the slope of the box is the same in both directions, there need be no waste at all in the cutting. Notice that as the short sides fit into a rebate, Fig 4, they will be

cut short the thickness of the lap left on the long sides. This rebate is now cut to a depth equal to the thickness of the stuff, and having trued up the ends the four sides may be glued together and nailed, the nails being driven askew to form a dovetail grip. When dry, plane down top and bottom edges square, and screw on the bottom. All sides are then cleaned up.

The handle is made from two pieces of 1 in. by ½ in, stuff, with a piece of ¾ in. dowel as a grasp. This latter is cut away at the ends, as in Fig. 3, to fit into corresponding holes bored in the side pieces. It is glued in, a fairly thick nail being driven in the end to make it fit tightly, and is fastened to the box by means of screws (Figs, 2 and 3). The tray is made in a similar way, except that grooves are cut across the sides to take the divisions, the centre one of which forms a handle. They are glued in and nailed. Small slips should be screwed to the main box to support the tray. *See* Box.

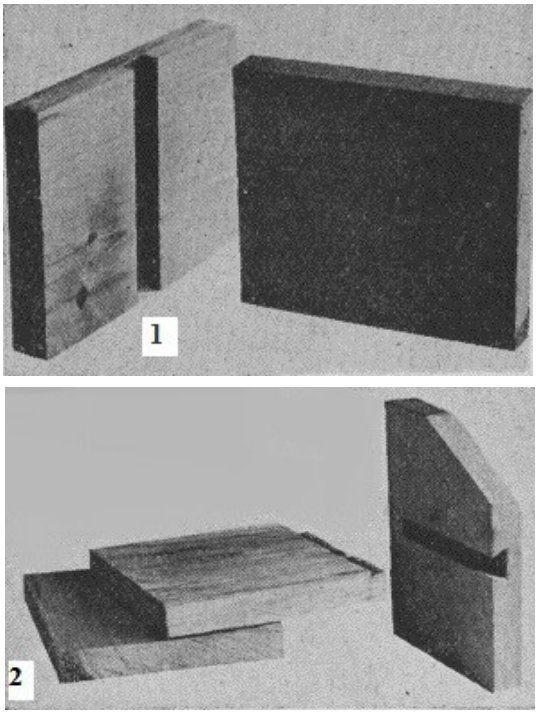
HOUSEMAID'S KNEE. What is popularly known as housemaid's knee is a swelling of the bursa, a small sac or bag of fluid situated on the kneecap. The medical term is bursitis. It occurs in occupations which involve much kneeling. A kneeling pad or mat, with a cavity for the knee, relieves the pressure on the kneecap, and the condition may disappear after painting with strong tincture of iodine and firm bandaging with a woven elastic bandage. In severe cases the bursa must be tapped.

HOUSING JOINT. This joint is one in which the breadth and thickness of the one part is recessed into the other part of the two members, which together form the joint. The simplest example is found in the construction of a bookcase, where upright side pieces are grooved across to receive the ends of the board forming the shelf.

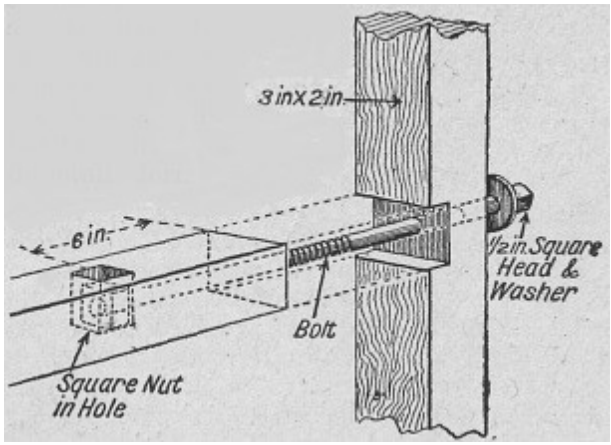
To make the plain joint for a bookcase, the end of the board for the shelf is first cut square across, the ends planed up true, and any ragged parts rubbed off with sandpaper, or preferably left clean from the plane. The depth of the groove is marked on each edge of the upright with a marking gauge, and the exact width of the groove scribed across the face of the upright with a sharp cutting point. Two saw cuts are made with a tenon saw, keeping very closely to the lines, made with the scriber, and the material between the saw cuts is removed with a chisel. working first from one side and then from the other, and levelling the bottom of the groove with a router. The board should fit tightly into this groove and may be secured with glue, by screws from the outside, or by fine nails driven from the inner angle.

The stopped housing is similar to the plain, but instead of the groove passing right across the upright, it stops short of the front face, the board being notched out the corresponding amount. The groove in this case is cut out with a chisel or router, as the saw can only be used at the open end.

The dovetailed housing may be stopped as shown in Fig. 2, or plain; either of these definitely resists any tendency for the upright to separate from the board. The latter has a dovetail formed on it by sawing across and carefully chiselling out the surplus material. The groove is cut in the upright with a tenon saw, except that instead of making two cuts, at least three are required, two to form the sloping sides of the dovetailed edges, and the third between these two. The wood is cut out with a chisel not wider than the narrowest width of the groove. If this precaution is not taken, the overhanging part of the wood at the dovetail side is liable to be torn as the chips come away, but by cutting down the centre of the groove the chips are better able to free themselves.



Housing Joints in course of construction. Fig. 1. Plain joint. Fig. 2. Stopped dovetail housing joint.



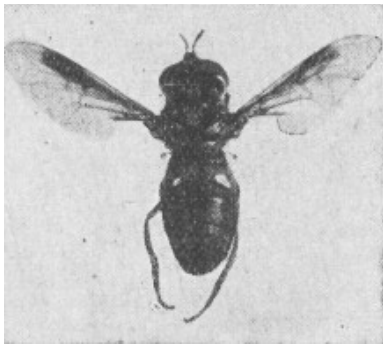
Housing Joint. Fig. 3. Diagram showing details of a draw-bolt joint used in framed timber work.

A type of housing joint that is of use in framed timber work, such as is required for outbuildings, etc., is the draw-bolt housing, Fig.3. The horizontal member is grooved into the upright as already described. A hole is drilled through the upright, and lengthwise into the

horizontal member for a distance of at least three times its minimum thickness. The diameter of the hole is slightly larger than the bolt to be inserted in it.

Another hole is then drilled at right angles in the horizontal member, until it meets the bolt hole. This second hole is cut out square and deep enough to admit a square nut. This is dropped to the bottom of the hole, the joint put together, the bolt pushed through the bolt hole, screwed into the nut, and tightened up tightly with a spanner. *See* Joint.

HOVER FLY. One of the gardener's friends is the hover fly, so named because it hovers above plants during bright sunshine, seeking a spot infested with aphides or plant-lice, among which it deposits its eggs. These produce larvae of a whitish colour which feed on the aphides. The method by which the aphides are killed is by means of hooklets in the mouth, with which the larvae pierce the bodies of their prey, afterwards sucking them dry. The parent flies are of yellowish colour, shining and metallic, marked with bands of a different shade of yellow, or orange. They live upon the juices of flowers, and are perfectly harmless. *See* Green Fly; Insect.



Hover Fly, a useful friend to the gardener. It is shown enlarged.

HOVIS BREAD. To make this bread it is necessary to use Hovis patent flour. Take 3½ lb of the flour and over l½ oz. of yeast, ½ teaspoonful of castor sugar, and about 1½ pints of warm water. Warm the mixing bowl before putting in the flour, cream the yeast with the sugar, and stir in sufficient water to make a thin liquid.

Make a well in the centre of the flour and pour in the remaining water, which should be hotter than that used in making white bread. Add the liquid yeast, and make up into a smooth soft dough. Well flour the hands and board when moulding the bread as this dough is inclined to be sticky. Make four loaves out of the quantity, place them in greased tins, and rise them for half an hour. Bake them from 25-35 min. No salt must be used in this bread. *See* Bread; Diet; Food.

HOW, WHEN AND WHERE. In this indoor game one player leaves the room while the others decide upon a word, preferably a noun with several meanings, such as chest. This done, the person outside is asked to enter the room. He has to find out what the word is by asking questions of the company in turn. These must take the form of, How do you like it? When do you like it? and Where do you like it? He continues this until, aided by the answers, he is able to guess the word, when another player leaves the room.

HUB. The central part of a wheel is the best known form of hub. That part of a Jock through which the spindle passes is also termed the hub, and the word is applied to the peg on to which the rings are thrown in the game of quoits. The hub of a wooden wheel is generally of hardwood, shod with iron or steel hoops; a bicycle wheel has a tubular type of metal hub. *See* Ball Bearings; Bicycle; Brake; Coaster Hub; Wheels, etc.

HUB BRAKE: For the Bicycle. These take two forms, the coaster brake, operated by back-pedalling, and another type operated from the handle bar of the machine. The latter resembles the internal expanding brake used on motor vehicles, in which two shoes are forced outwards against the inner surface of the brake drum. *See* Brake; Coaster Hub.

Hub Gear. *See* Three Speed Gear.

HUCKABACK. A favourite material for towelling, huckaback has a thick, spongy texture which makes it more absorbent than plain, smooth fabrics. Linen huckabacks are to be preferred both on the grounds of absorbency and strength. *See* Linen; Towel.

HUMANIZED MILK. For the purpose of infant feeding humanized milk is prepared from cow's milk by many of the large dairies. In cow's milk, as compared with human, there is about the same amount of fat, about twice the quantity of proteins and of salts, and only 5/7 the amount of carbohydrate, in the form of lactose or milk sugar.

In a mixture of equal parts of cow's milk and water the protein will therefore be right, and also the salts, but the fat will be halved and the sugar will be further reduced to about ⅓ of the desired amount. To rectify this, as much good cream should be added to the mixture as is obtained from the amount of milk used, eg. ½ pint or more as the case may be in making up the mixture, and milk sugar should be added in the proportion of rather less than ½ oz. to a pint of mixture. Even then there is a difference from human milk, notably in the relative proportions of the two kinds of protein found in milk, viz. from that which is coagulated by heat and that coagulated by rennet. But the method described, though rough and ready, is easily done at home, and the results are usually good. Strict cleanliness must be observed. *See* Baby; Milk; etc.

HUMEA. Humea elegans is a vigorous greenhouse plant which has large fragrant leaves and in summer produces panicles of small reddish blooms on stems 5 ft. or so high. It is raised from seeds sown under glass in June and will bloom the following summer. When the seedlings are large enough they must be potted in small pots, using a compost of loam, leaf-mould and sand: repotting must be continued as becomes

necessary until in spring the plants are put in 8 in. or 9 in. pots. During summer they are grown in a cold frame. Decayed manure should be mixed with the compost for the final potting. During winter the plants should be kept in a temperature of 50 degrees. After having flowered, the plants are useless.

Hump Back. *See* Curvature; Spine.

HUNDREDWEIGHT. This measure of weight, used for coal and other heavy substances, contains 112 lb.; 20 hundredweight make a ton. The usual abbreviation, cwt., is used throughout this work.

HUNT THE SLIPPER. For this children's game, more suited for indoors than for outdoors, the players, who may number 20 or more, though 8 or 10 can play it, sit in a circle, except one who stands out. They sit with the feet drawn up and the knees raised, so that the slipper can be passed from under the knees of the participants.

The object of the game is to pass the slipper from one to another in such a way that the odd player who is on the outside of the circle does not know in whose hand it is. His object is to find that person and to touch him when in possession of the slipper. When he does this he takes his place in the circle and the person touched becomes the hunter.

HUNT THE THIMBLE. For this game an ordinary thimble is produced, and one member of the party undertakes to hide it, while the others leave the room. It may be hidden anywhere in the room, provided that it is visible without necessitating the removal of anything. When it is hidden the party is summoned into the room, usually with the formula:

Hot beans and melted butter;
Ladies and gentlemen, come to supper.

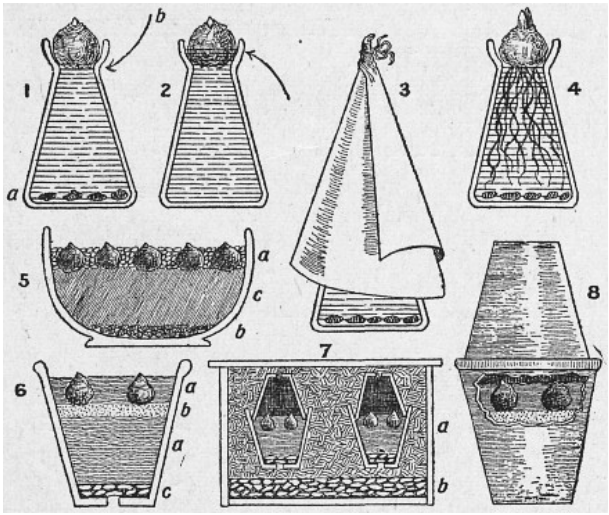
They enter, beginning their search from the moment they are inside the door. The hider may direct them when they are warm, hot, or cold, according to their proximity to the thimble. When somebody sees it, he or she moves quietly away and sits down, taking care not to betray its whereabouts by word or gesture. The game continues until each member of the party has discovered the thimble, when the first finder becomes hider.

HUSBAND: In Law. In all matters of property a husband's interests are now separate from a wife's. He has no more claim to her property than she has to his, He is not liable for her debts, except that he is bound to provide her with necessary food, lodging, apparel and other things according to his position in life; if he does not provide them, or give her the money to buy them, she can order them on his credit. This right vanishes if she runs away, or if he is obliged to turn her out for misconduct.

A husband is not liable for consequences of his wife's torts, i.e. wrongs, such as libel and slander, negligence and the like. A wife may, for her benefit, insure her husband's life.

In Scotland a wife is entitled to a life interest in one-third of her husband's property in land and a husband to a life interest in the whole of his wife's property in land. In addition a surviving husband (or wife) has a right, which cannot be taken away by will, to one-third of the movable estate if there are children of the marriage, or one half if there are no children. A wife cannot recover money lent to her husband for his business until all other debts have been paid. *See* Divorce; Intestacy; Separation; Wife.

HYACINTH. The hyacinth is a favourite spring flowering bulb suitable for planting in flower beds and borders out of doors, or for cultivation in pots of soil in the greenhouse and in bowls of fibre in the home. The bulbs should be planted out of doors in October, 3 inches deep and 8 inches apart. If several varieties are grouped in one bed, care should be taken to choose those that flower at the same time. The following groups of varieties bloom together: Queen of Pinks, pink, Ivanhoe, violet blue, L'Innocence, white, Primrose Perfection, pale ye1low, and Gertrude, rose pink. Grand Lilas, pale lilac blue, Schotel, pale blue, Lady Derby, salmon pink, Duke of Westminster, purple, Marie, dark blue, and City of Haarlem, yellow. Hyacinths in pots of soil are invaluable for the greenhouse in spring.

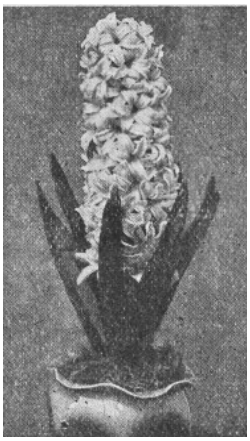


Hyacinth Culture. 1. Water culture: a, charcoal; b, height of water. 2. Too much water. 3. Shading to encourage root growth. 4. When to transfer to light. 5. Bowl culture: a, shingle; b, charcoal; c, fibre. 6. Roman hyacinths in a pot: a, compost; b, sand; c, crocks. 7. Potted bulbs plunged in covered box of fibre: a, fibre; b, shingle. 8. Pot of bulbs excluded from light by means of another pot.

The bulbs should be potted separately in early autumn in 5 in. or 6 in. pots in a compost of loam with which sand, some leaf-mould and a scattering of bonemeal have been mixed. The bulbs should be just

covered with soil, which must not be made too firm, or the bulbs will be forced upwards. The pots of bulbs should be watered, placed on asphalt or some other hard base out of doors, covered with old sifted coal ashes and left there for 6 or 8 weeks; by then they will be well rooted. Ashes fresh from the fire must not be used. After the pots of bulbs are taken from the ashes they should be shaded for a few days before being exposed to full light in the greenhouse.

The earliest hyacinths are the Roman, bulbs which have been specially prepared for forcing, and the cynthella or small-flowered sorts. Bulbs of these should be potted in August and September, those of the large-flowered varieties in October, to ensure a succession of bloom. They must be grown in a greenhouse heated sufficiently to keep out frost. The same sorts are suitable for cultivation in bowls of fibre indoors. They should be kept in a cool dark place for 6 weeks before being set in the room window. Care must be taken that the fibre does not become dry.



Hyacinth. Bloom of one of the large-flowered hyacinths grown in fibre in a bowl.

Hyacinths may also be grown indoors in wide-mouthed glasses filled with water; there should be a space of ¼ in. or so between the base of the bulb and the water. They must be kept cool and dark until roots have formed. *See* Bulb; Flower Garden; Galtonia.

HYDRANGEA. This splendid flowering shrub (Hydrangea hortensis) is hardy in southern counties and in other mild districts, where in sheltered places it forms a large bush. It is also a great favourite for cultivation in tubs and large flower pots for the greenhouse, veranda and terrace; it flowers in late summer.



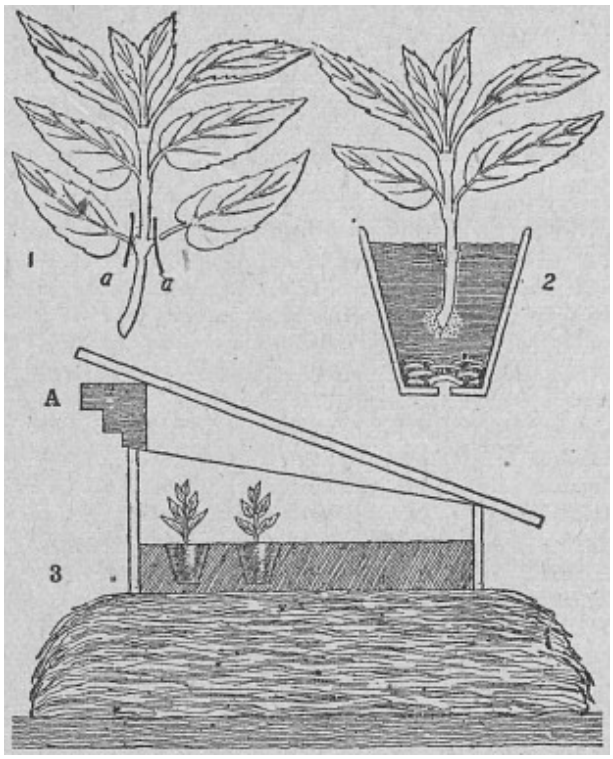
Hydrangea. Fine head of the flowering shrub grown as a pot plant for indoor use.

The normal colour of the flowers is pink; there are also white varieties. Blue hydrangeas, which are the most popular of all, are obtained by the application of a blueing powder to the soil; this can be obtained from nurserymen with direction's for use. Some varieties, when treated with blueing powder, produce true blue flowers; others turn mauve or mauve blue. In some gardens, where the soil is ferruginous, hydrangeas bear blue flowers without any treatment.

Propagation is by cuttings of flowerless shoots taken off in August, inserted singly in small pots of sandy soil and placed in a frame. If grown in a heated greenhouse and repotted in 5 in. pots in January many of these small plants will bloom the same year.

Hydrangeas are easily spoilt by incorrect pruning. When the blooms of pot plants are over, thin weakly shoots should be cut out; the tips of other shoots may be cut off if they are unduly long. Big bushes of hydrangea planted out of doors need little pruning.

Hydrangea paniculata grandiflora is a striking hardy shrub which bears large heads of cream white bloom in September. This needs quite different pruning; in spring the past summer's shoots should be cut back to within 3 or 4 in. of the base.



Hydrangea Culture. 1. Suitable cutting, properly trimmed at a. 2. Same, correctly potted. 3. Sectional diagram of cuttings plunged in frame, with good method of ventilation shown at A.

HYDROCEPHALUS. Popularly known as water on the brain, hydrocephalus is a condition in which a large amount of fluid collects within the brain through blocking of the drainage channels.

In children the disease is recognized easily. The head enlarges, sometimes to such a size that the child cannot raise it from the pillow. The eyes are sunken, there is inflammation of the optic nerve, sometimes followed by blindness. Convulsions are common. As a rule the child is mentally weak or imbecile. Death usually occurs before the fourth or fifth year. Pron. Hy-dro-sef'-al-us.

HYDROCHARIS. A native water-plant, also known as frog-bit, the hydrocharis has white flowers and leaves, borne on the surface of pools where there is no flow or motion. It may be collected in the spring and

introduced into cultivated water-gardens, and is propagated by division. It is of value in collections of aquatic plants. Pron. Hy-droch'a-ris.

HYDROCHLORIC ACID. Strong hydrochloric acid is known as spirit of salt, and if swallowed acts as a corrosive poison.

The acid is used in medicine in the form of the dilute hydrochloric acid, dose 5 to 20 minims after meals. This is frequently prescribed in sluggish indigestion where the natural hydrochloric acid secreted by the stomach is deficient in amount.

In the type of indigestion accompanied by heartburn and acidity, when the acid is due to an excess of the natural hydrochloric acid, dilute hydrochloric acid given before the meal tends to check the abnormal pouring out of acid into the stomach, and so relieves the disagreeable symptoms. *See* Indigestion.

HYDROPHOBIA. The infectious disease known as hydrophobia, or rabies, is communicated to man mostly by the bite of a rabid dog. The poison travels up the nerves to the spinal cord and brain, and produces spasm of muscles, particularly those of the pharynx and larynx, paralysis, and generally death if not properly treated. It has been said that only 15 per cent, of those bitten by mad dogs are attacked by hydro-phobia. The incubation period usually is one to two months. Children are the most common victims. On being bitten by a suspected dog immediately tie a cord round the limb above the wound to promote bleeding. Suck the wound and squeeze as much blood as possible out of it. If hot water is at hand bathe the wound with it to encourage bleeding. Send for the doctor, or go to him immediately, as the wound should be cauterized at once.

This cauterization should be done as soon as possible; if not done within twenty-four hours after the bite it is probably useless.

The patient after this first-aid treatment should be sent as soon as possible to an institution where the Pasteur treatment can be obtained. In Great Britain this is carried out at St. Thomas's Hospital, London. Unless a bitten person comes under Pasteur treatment before the disease fully develops, the case is generally hopeless. The dog should not be destroyed at once, but should be shut up and kept under observation to see if it is really rabid. If it is suffering from rabies it will be dead within ten days; if it survives this period, a bitten person need have no fear of hydrophobia.

HYDROQUINONE. Quite a slow-acting developer, hydroquinone is particularly useful when negatives with maximum centrast are required, as in copying drawings in line, lettering or similar black and white subjects. For ordinary purposes it is usually made up with another developer, metol, as described under metol-hydroquinone. A formula is made up thus:

Hydroquinone	50 gr.
Sodium sulphite	¾ oz.
Sodium carbonate	1½ „
Water to make	10 „

Dilution with water up to 20 oz. will give softer results. The following two-solution formula with caustic soda gives a more quickly acting developer:

SOLUTION 1.

Hydroquinone	80 gr.
Sodium sulphite	1 oz.
Citric acid	30 gr.
Potassium bromide	20 „
Water to make	10 oz.

SOLUTION 2.

Stick caustic soda	80 gr.
Water to make	10 oz.

For use take 1 oz. of each solution and add 2 oz. water. Where pure black and white results are wanted the addition of formalin gives excellent results, as in the following formula:

Hydroquinone	65 gr.
Sodium sulphite	3 oz.
Formalin	1½ dr.
Water to make	10 oz.

The Watkins factor for hydroquinone in the first and third formulas given above is 5; in the second it is 4½. In all developers containing hydroquinone the temperature must not be allowed to fall below 60° F. or action will cease almost entirely. The solution must be fresh and contain the full quantity of sulphite, or stains will result. Between developing and fixing, negatives should be well rinsed. *See* Developing Metol-hydroquinone; Quinol.

Hymenocallis. This is a bulb plant suitable chiefly for cultivation in a hothouse. The correct name is pancratium (q.v.).

HYMENOPHYLLUM. This is one of the filmy ferns. It must be grown in a closed case in which the atmosphere is kept thoroughly moist. *See* Fern.

Hyperacidity. *See* Acidity; Indigestion.

HYPNOTIC. Drugs used to induce sleep are termed hypnotics. All, while useful when taken under the direction of a doctor, are more or less dangerous if self-prescribed. The patient in many cases becomes so dependent upon the drug in order to get a night's rest that finally he cannot sleep without resort to it. Hypnotic drugs lose their efficiency as the patient becomes used to them, so that larger and larger doses

are taken, until finally the safety limit is passed. *See* Insomnia.

HYPO: For Fixing Negatives. Hypo or hyposulphite of sodium is used for fixing negatives and prints in photography, and should not be less than the average strength of 4 oz. to 1 pint of water; it may be more, up to 8 oz. to the pint. For bromide and gaslight prints it may be half strength. Too strong a solution will blister some bromide papers.

A convenient and rapid method of dissolving hypo is that described and illustrated under the heading Developer. Solution is further hastened by using warm water.

Hypo solution keeps reasonably well, particularly if an acid solution such as the following is used:

Hypo	4 oz.
Potassium metabisulphite	½ oz.
Water	20 oz.

This bath should not be used for the P.O.P. papers printed by daylight. Fresh hypo solution should be used for every batch of plates or prints fixed. It is very cheap, and prints and plates are then certain to be properly fixed. A strong stock solution which can be diluted for use is a very satisfactory way of storing hypo. Dissolve 1 lb. of hypo in a pint of hot water. When cool add water to make it up to 32 oz.. Then every 2 oz. of the stock solution contains 1 oz. of hypo, and any strength of solution required for use is readily calculated.

Do not allow drops of hypo solution to fall on the dark-room table or floor without mopping them up, or particles of the dried chemical float in the air of the dark-room and cause spots and blemishes on negatives and papers. *See* Film; Fixing; Washing.

HYPOCHLOROUS ACID. The name is given to a liquid with a penetrating odour which is used for removing ink-stains from paper or white fabrics. In ink-erasers hypo-chlorous acid is generated by adding acetic acid or vinegar to a solution of chlorinated lime. To prepare a liquid ink-eraser mix chlorinated lime or bleaching powder, 4 oz., with water 15 oz., shake together for an hour and strain. To the strained liquid add acetic acid 6 oz., and bottle at once. For removing ink-stains the liquid is sponged on the stain, repeating until the stain has disappeared, then rinsing the spot with clear water. *See* Stains.

HYSSOP. The hyssop is a hardy evergreen herb, the shoots and flowers of which are used for medicinal and perfumery purposes. The common hyssop, Hyssopus officinalis, bears blue-purple flowers and grows to a height of 2 ft. It thrives best in well-drained soil. Planting may be done in April or May, 1 ft. apart each way. Propagation is by seed sown outdoors in April, cuttings of shoots in summer, or by division of roots in spring or autumn. For distilling purposes flowers should be gathered when opening.

As Medicine. The dried flowers and shoots are infused for medicinal purposes. The infusion forms an aromatic bitter, and is taken as a tonic and for flatulence. It may also prove beneficent in cases of chronic bronchitis. *See* Bronchitis; Flatulence.

HYSTERIA. The symptoms are many and varied. A person may be potentially hysterical without ever exhibiting any symptoms. If, however, a person is subjected to some exceptional degree of stress or strain, his normal element of control may become weakened, and then the hysterical condition develops. Very many examples of severe hysteria were seen among soldiers in the Great War. In civilian life grief, fright, disappointment in love, anxiety, prolonged overwork and sudden unexpected physical shock may be the immediate cause of hysteria.

In cases of hysteria paralysis of one or more limbs is not uncommon. Disturbance of sensation is frequent. Twitching of muscles or groups of muscles may be seen, leading to spasmodic movements of the face or limbs. The special senses, hearing, seeing, tasting, smelling, may all be abnormal. Stuttering is frequent. Some patients exhibit convulsive seizures or fits which may lead to a diagnosis of epilepsy. Mentally, there may be depression, emotional instability, as evidenced by frequent outbursts of tears, nervousness, irritability, dreamy states, unreasonable fears, and attacks of acute anxiety.

Treatment. The treatment of hysteria may be palliative, i.e. directed towards relieving the obvious symptoms, or radical, which aims at discovering the fundamental psychological cause of the condition. In mild cases simple measures such as rest in the country, a sea voyage or change of occupation may be sufficient to restore the normal degree of self-control. Paralyses, loss of voice, stuttering, and similar symptoms may be removed by a course of treatment consisting of physical exercises, which are, however, in effect a vehicle for suggestion.

This treatment, however, while removing the physical symptom, is not likely to improve the mental condition, which may indeed become worse after the physical symptom has disappeared. The extreme form of suggestion is hypnotism, and in certain cases this line of treatment has been known to be of great benefit. Undoubtedly, the most satisfactory and radical treatment of hysteria is an investigation of the patient's subconscious mind, with the object of finding out the suppressed motives which, in conflict with the conscious mind, are really responsible for the condition. One of the chief methods of investigating the subconscious mind is by psycho-analysis (q.v.). This method of treatment usually gives the best results in the case of persons below middle age. It is not suitable for elderly people or for those of poor mental development.

HYSTERICS. The fits or convulsions which occur in hysteria are popularly known as hysterics. They

occur most commonly in young women, and are usually preceded by emotional disturbances, bouts of weeping, alternating, perhaps, with wild and unnatural mirth. Sometimes patients complain of feeling a ball rising in the throat, as if it would choke them. There is great restlessness, or the patient may fall down and have a fit which has a close resemblance to an epileptic one.

The patient should be laid comfortably on her bed, all tight clothing being loosened. The room should be cleared, as the presence of a crowd of excited and sympathizing friends tends to foster symptoms of hysteria. A douche of cold water on the face, and an intimation that this is to be frequently repeated, sometimes has a good effect in hysterical attacks. The ammoniated tincture of valerian in dram doses, every 3 or 4 hours, is a good remedy.

IBERIS. This is the botanical name of the popular hardy perennial and annual flowers that are better known as candytuft (q.v.).

ICE: Domestic Uses. Ice is often impure, and may contain germs of disease, especially of typhoid fever. When used to allay vomiting, to cool beverages, etc., it should be obtained from a reliable source. To keep ice from melting roll it in thicknesses of flannel. It can be chipped with a strong needle or ice pick.

Iced water and other iced drinks should be used moderately, otherwise dyspepsia may result. A small piece of ice allowed to dissolve in the mouth is a good remedy for thirst, and proves very grateful in fevers.

Ice is used largely for keeping food cool in hot weather. It should not be placed in direct contact with fish, but may be used with advantage if the latter is first placed in paper bags and fastened down. *See* Frozen Food; Refrigerator.

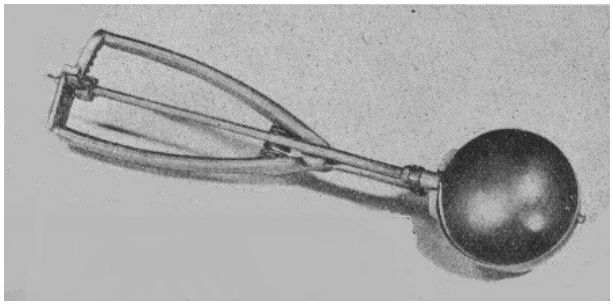
ICES AND ICED DISHES
Recipes for Plain and Fancy Varieties

See also the articles on Coffee; Custard Freezer; Genoese Pastry; Icing; Mould; Refrigerator.

Generally speaking, ices can be divided into two classes, cream ices and water ices. Cream ices form the foundation of many dessert dishes such as mousses, coupes, sundaes, ice puddings, moulded fruit ices, etc.

To be correct cream ices should consist of equal parts of sweetened cream and fresh fruit purée; or flavouring essences, such as coffee, chocolate, vanilla, orange or lemon, can be used. In winter, when fresh fruit is not obtainable, jam or bottled fruits can be substituted. These should be made into a purée before adding to the ice. As cream is often highly priced a good rich custard may be substituted, wholly or in part.

The necessary equipment for making ices consists of a freezer and a wooden spatula or bone paper knife. There are many inexpensive freezers on the market for making small quantities of ices. *(See* Freezer.) The vacuum freezers freeze the mixtures without the usual churning. Ices can also be made in electric or gas refrigerators without churning. An ice cream scoop should be used for serving the ice cream in neat portions (Fig. 1).



Ice. Fig. 1. Ice cream scoop, a simple device used for serving small circular portions of ice cream.

To make ices in a freezer a freezing mixture is necessary. This consists of seven pounds of rough ice to one pound of freezing salt. Table salt is no good. The ice should be broken up very small. Pack the ice and salt an layers in the ice container, very solidly, and fix in the freezing vessel while packing, so that a tight fit is obtained. When pressed for time the mixture may be frozen more quickly by increasing the proportion of salt, but when this is done the ice melts more quickly and must be renewed.

Make the ice cream mixture as directed, put it into the freezing pot and close the lid firmly. Then rotate it in the ice. After a few minutes wipe the lid carefully, take it off, scrape down any mixture frozen to the sides of the pot, and beat the mixture until smooth. Use a wooden spatula, or bone paper knife, for this. Put on the lid, churn the freezer again and repeat the whole process until the mixture is evenly frozen all through. Keep the mixture in the freezer until needed and cover it with a piece of wet flannel. Drain off the water now and again, and, if necessary, pack in more ice and salt. If using a vacuum freezer this churning will not be necessary.

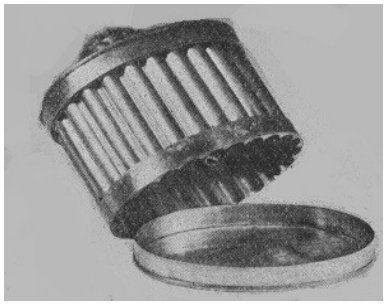


Fig. 2. Ice pudding mould, which may also be used for moulding ice cream into a fancy shape.

A substitute for a freezer can be made with a pail and a vessel with a well-fitting lid to contain the mixture. A two-pound golden syrup tin with a lever lid is excellent for the purpose. Put the mixture in the tin, cover securely, stand it in the pail on a bed of ice and salt, pack the ice and salt well around it, and with the handle of the pail twist it round for a few minutes. Repeat the process as described for the proper freezer. When the mixture is thoroughly frozen, cover it tightly and put a piece of blanket, or felt, over the top of the pail, with the ends resting on the ice to absorb the brine. Repack with ice

and salt, if necessary, and allow it to stand at least an hour before using.

Facts to Note. Here are a few rules that wil make the ices a success:

Never put warm mixtures into the freezing vessel; they take longer to freeze and melt the ice surrounding it.

Too much sugar makes the mixture slow to freeze, sometimes preventing freezing altogether: on the other hand, too little sugar causes the ice to be too hard. The richer the ice the longer it will take to congeal.

Take every possible care to keep the freezing salt from coming in contact with the ice mixture.

Essences should be blended with the custard.

Use pewter or aluminium vessels whenever possible; they are cold and flavourless. Do not use copper moulds for ice puddings as they give an unpleasant flavour and are dangerous to health.

For dessert, cream ices are often packed into fancy moulds of pewter to represent fruits. The ices should then be coloured to correspond with the fruits they represent. If no moulds are available the ice can be made into oblong blocks and served on glass plates (Fig. 3), or the ice can be formed into balls and rolled in chopped nuts or coloured desiccated coconut (Fig. 4). Serve ice cream wafers or petits fours with all forms of dessert ices.

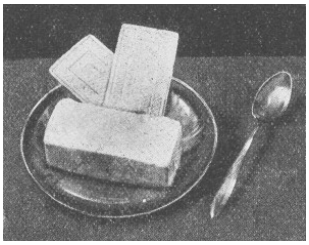


Fig. 3. Ice cream for dessert shaped into oblong portions and served on glass plates, with wafers.

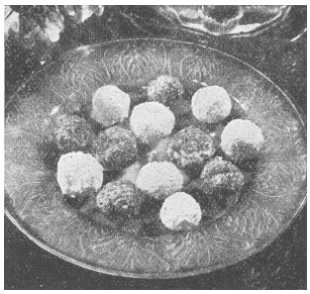


Fig. 4. Ice cream formed into balls and rolled in chopped nuts or coloured desiccated coconut.

Sponge cakes, or Genoese cakes, are often given a filling of ice cream. The cream is shaped in a high round tin, either fluted or plain. The centre is scooped out and just before serving it is filled with well-flavoured ice cream. A round of cake is placed on the top, and on this is piled some kind of firm fruit which has been previously cooked and kept on ice. Pour some of the syrup around the cake and serve at once.

Vanilla Ice Cream. For this take one pint of rich custard, half pint whipped cream, vanilla to taste. Allow the custard to get cold, and flavour it with the vanilla, put it in the freezer and half freeze it. Then add the cream, beat it well in, and continue the freezing as directed. For an economical ice cream the cream may be omitted or less used.

Strawberry or Raspberry Ice. To a pound of fresh strawberries, or raspberries, allow half a pint of cream, four ounces castor sugar, half tablespoonful lemon juice and cochineal to give good colour. Rub fruit through a sieve; mix purée with lemon juice and castor sugar. Whip cream and stir in; add cochineal. Freeze as directed. Apricot cream ice is made in the same way, using fresh or tinned apricots.

Coffee Ice. Take half a pint of strong coffee, half a pint of good custard, quarter pint cream and quarter pound loaf sugar. Mix the coffee, hot custard and sugar. Half freeze when cold; then add cream and finish freezing. Serve in separate glasses.

Neapolitan Ices. These are composed of various kinds of ice cream frozen separately and then packed into oblong moulds in equal portions. When these are hard they are removed from the moulds and served without cases on small glass plates, as shown in Fig. 3. Moulds can be bought for making these ices. The Neapolitan mixture can also be made into an ice pudding.

Mousse. The mousse is a light ice cream mixture usually composed of well-flavoured fruit syrup, or purée, with cream that has been highly whisked. It is then frozen in plain large or small moulds lined with paper. The high whisking makes it light and frothy in appearance. The top should be decorated with berries or pieces of fruit and chopped nuts.

Sundaes. Cream ice and fruit sundaes are served in individual glasses. These are almost filled with the cream ice and fresh or tinned fruit in small pieces added. The fruit syrup is then poured over and chopped nuts sprinkled thickly over all. If fresh fruit is used, such as strawberries or raspberries, it should be sprinkled with sugar and allowed to stand for a time. The syrup thus formed can then be poured over the ice cream.

Coupes. The coupe is another form of fruit ice, made from either water or cream ice. It is usually served in glasses.

Coupe à la Milanese is a lemon-water ice flavoured with cherry brandy, and mixed with enough brandied cherries to allow about three to each portion of ice. Another form of this fancy ice, known as coupes d'abricots, is prepared in this manner. Mix a pint of apricot cream ice with 4 tablespoonfuls of tinned apricots cut into small cubes. Flavour them with some liqueur and serve in glasses, putting in first a small spoonful of the ice, then a light layer of powdered ratafias, then more ice, and so on until sufficient ice has been used for a portion. A layer of the ice should be put in last and the top decorated with shreds of bright green pistachio nuts.

Coupes aux marrons are prepared by soaking some broken marrons glacés in a little liqueur, and putting small tablespoonfuls of them into some glasses. Fill them up with vanilla ice cream, and decorate the top of

each with a marron glacé and a little whipped cream.

Another similar sweet, known as coupes Jacques, is prepared by half-filling some glass cups with fruit salad, flavouring it with kirsch, and then covering it with one layer of vanilla and another layer of strawberry ice cream. Decorate the top with a grape or cherry. Some slight variation can be provided by using different liqueur for flavouring.

Pêche Melba. This is another form of fancy ice, made with cream ice and peaches. The peaches are divided in halves and stoned and steeped in liqueur and a sprinkling of sugar added, or tinned peaches can be used. They are served with a surrounding of rich ice cream and garnished with whipped cream arranged in the centre. A little syrup is poured over. Other Melbas are made in the same way, substituting pineapple, strawberries or pears for peaches.

Lemon Water Ice. This requires care to be successful. In lemon water ices the juice of the lemons must be added after the syrup of sugar and water is made and must be perfectly incorporated. Take ¾ pint water, the juice of three lemons, a teacupful of loaf sugar, and the whites of two eggs. Wipe the lemons, then rub some of the lumps of sugar over the outer parts of the peel to get the essence of the lemons. Boil the sugar and water for ten minutes till it forms a thread between finger and thumb. Allow it to cool, then add the strained lemon juice. Pour the mixture into the freezer and half-freeze it, take it out and add the beaten whites of the eggs and beat them well in. Return to the freezer and freeze to the desired consistency. In all water ices the chief point is to draw out the parti-cular flavour of the fruit used. Orange water ice is made in the same way as lemon water ice, substituting oranges for the lemons.

Sorbet. This is the water ice flavoured with liqueur and with fruit added. It is served in a goblet in the middle of a formal dinner just before the roast. Russian cigarettes are usually handed round with it.

Ice Pudding. Half freeze one pint of rich custard and add 2 oz. mixed glacé fruits, cherries, apricots, oranges, etc., a few finely chopped almonds, pistachio nuts, a dessertspoonful chopped preserved ginger, 2 teaspoonfuls maraschino and half a pint whipped cream. Half freeze as before. Wet the ice mould (Fig. 2) and decorate it with nuts and fruit. Pack in the frozen mixture, put on the lid and cover all the joints, cracks, lid opening, etc., with lard to prevent any salt coming into the mixture, and then wrap the mould in two or three thicknesses of paper. Bury it in the ice and salt and freeze for two to three hours. To unmould, first remove paper and lard, dip mould in cold water, remove lid gently and slip the pudding on to the dish.

Iced Food and Drink. Certain foods and beverages, though not ices in the accepted sense of the term, are subjected to a freezing process and are therefore said to be iced. White coffee may be iced by placing it in a jug resting on ice, and leaving it until it is icy cold. Black coffee is similarly iced, except that the jug is put deep into the ice, a little brandy added, and a lump of ice put in just before serving. Tea that is to be iced should be freshly made and poured off the leaves as soon as it is ready for drinking. Leave it to cool and then pour it into a glass containing some frozen ice, a thin slice of lemon and a little sugar to taste.

ICE BAG: Its Medical Uses. A convenient means for applying continuous cold to any part is provided by the use of an ice bag. Ice is broken up into very small pieces and put in an india-rubber bag, so as to half fill it.

In typhoid fever, in the presence of pain or haemorrhage, an ice bag may be ordered to be placed on the abdomen. It proves useful also in early appendicitis, and as the weight of the bag would tend to increase the pain, the bag is slung from a bed cradle so as just to rest on the skin, but no more. An ice-cap or bag to the head is often of great use in lessening the pain in severe headache, such as migraine. Care has to be taken against leaving an ice bag too long in contact with the skin, especially in the old, as a sore may be produced. *See* Cold Pack.

ICELAND MOSS. This lichen may be cooked in the same way and used for the same purpose as Irish moss. It has a somewhat bitter taste, but this may be partly remedied by adding a pinch of soda to the water in which it is soaked. *See* Irish Moss.

ICELAND POPPY. This very beautiful hardy plant (Papaver nudicaule) has long-stemmed flowers in orange, yellow or white, which appear in May and June. In recent years new and improved types with large and more richly coloured blooms have been raised, e.g. the Sunbeam and Coonara poppies. In the latter the flowers are of salmon, fawn, biscuit, apricot, etc. All these varieties are treated as biennials: they are raised from seeds sown out of doors or in boxes of soil in May to produce flowering plants next year. Before the seedlings become crowded they must be set on a reserve border at 6 in. apart until finally planted in October where they are to bloom.

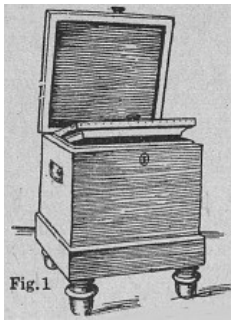


Iceland Poppy, showing the number of graceful flowers that are produced by one plant. (Courtesy of Amateur Gardening)

ICE PAIL. An ice pail is a simple form of wine cooler. In the shape of a'pail, it was made in silver and Sheffield plate, as well as in the cheaper metals. After a time pieces were de-corated, ornament taking the form of reeding, usually round the body about a third of the way from the top. The best specimens were made in the 18th century and the early part of the 19th.

ICE PLANT. This is another name for Mesembryanthemum crystallinum, a showy annual for hot, dry places mesembryanthemum is known also as fig marigold.

ICE SAFE. Uncooked foods may be stored safely for several days in an ice box with about ½ cwt. of ice. It consists of an outer case enclosing a zinc box, the space between them being packed with slag wool, sawdust, or some other material that is an equally good non-conductor of heat.



Ice Safe. Fig. 1. Simply made safe for storing uncooked food.

The example illustrated shows the component parts and various details, the dimensions being suitable for a small household, but may be increased or diminished to suit requirements, and the form of the box can be modified. The ice can be obtained from any good-class stores, or sometimes by arrangement with the fishmonger or butcher, who will deliver supplies regularly.

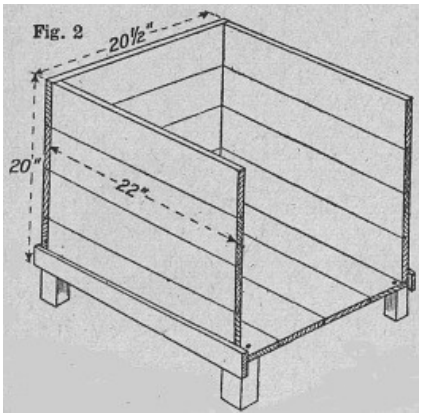


Fig. 2. Outer case in part section with one end removed.

The outside wood case can be made with 1 in. tongued and grooved boards dovetailed together at the corners, or nailed together and reinforced with little straps at iron screwed over the corners. The bottom is of similar material, screwed to the sides. The dimensions are given in Fig. 2. The feet may be turned or made of 3 in. square deal planed to a slight taper, so that they are about 2½ in. square at the bottom. These are screwed to the bottom of the case with wood-screws passed through from the inside. A plinth of deal, 3 in. wide and 1 in. thick, is glued and screwed round the outside of the bottom, the corners being neatly mitred and the edges chamfered.

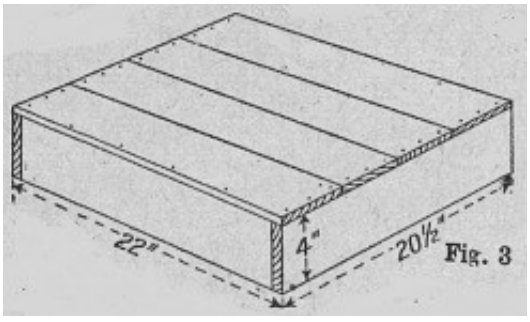


Fig. 3. Detail of outer lid.

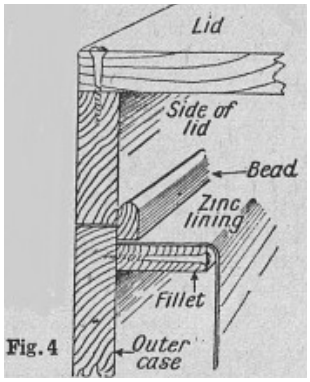


Fig. 4. Detail of inner lid.

The lid of the case, Fig. 6, is floor-board and a framework of deal, 4 in. wide and 1 in. thick, screwed, at the corners or dovetailed. If they are screwed, they can be reinforced with iron angle plates screwed to the outside. The lid is hinged to the back of the box. An alternative method is to make the whole box in one piece, lid and bottom included. Screw the whole together, then mark a line round the outside of the box and saw off to this line, the meeting surfaces being planed up true and flat.

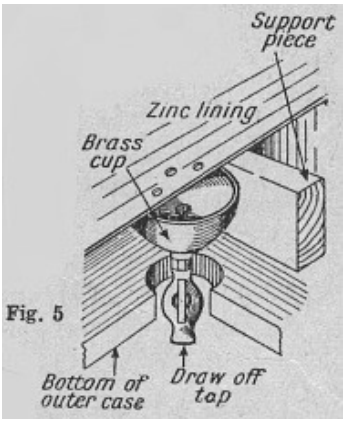


Fig. 5. Bottom of case with draw-off tap.

The zinc lining, Fig. 7, may be made from separate pieces, riveted at the corners and soldered. If a large sheet of zinc is obtainable the lining can be made in one piece by bending up the bottom angles, the vertical edges being flanged, riveted and soldered. The upper part is turned over at right angles, mitred at the corners, and soldered. In the centre of the bottom a tap, Fig. 5, is fitted by soldering a bush piece into the bottom of a brass cup, such as can be made from the top of a bedstead knob. This is soldered on to the bottom of the zinc lining, and the tap into the bottom of the recess.

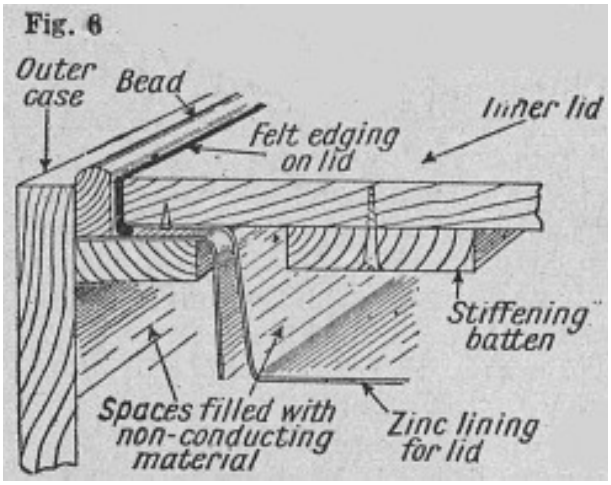


Fig. 6. Lid.

The zinc above the brass cup should be pierced with small holes about ⅛ in. in diameter, so that it will act

as filter. A hole is cut through the bottom of the wood casing to allow the tap to pass through, and fillets are screwed to the inside of the wood case for the zinc lining to rest upon, as in Fig. 3. The space between the zinc lining and the outer case should be packed with insulating material.

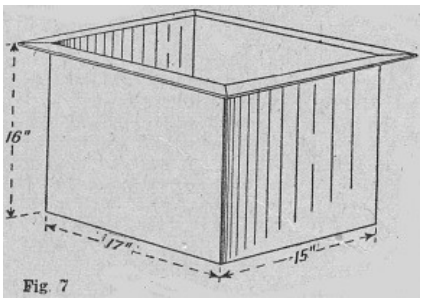


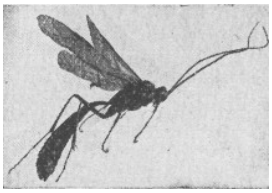
Fig. 7. Inner zinc lining.

To make the zinc-lined lid, fit a fillet round the opening at the top of the zinc case and round off the edges; then make a plain wooden inner lid that will just fit into the space inside the fillet. Prepare a zinc lining similar to the case, but smaller and only 2 in. deep. Turn a flange on to it and temporarily screw it to the underside of the inner lid (see Fig. 4). Hinge the lid to the top of the outer case, and see that the lining on the lid closes into the case and fits closely. The meeting surfaces round both inner and outer lids can be covered with a good close-grain cloth, as this assists in keeping the joint tight. The interior of the lid lining has to be filled with non-conducting material, for which purpose it must be removed, packed tightly, and replaced.

Internal fittings will be determined by individual requirements, but one or more shelves of perforated zinc on a framework are essential. These are readily made by cutting the parts to size and making soldered joints. The shelves are supported on angle pieces soldered to the sides of the inner lining. Sufficient space must be left for the ice, and a practical arrangement is to have the shelves just a little less than one-third the width of the lining so that they can be arranged in the most advantageous way, omitting the centre one if the block of ice is at all tall and narrow. The whole interior has to be cleaned thoroughly with warm water to remove all traces of the soldering acid.

A good way to finish the exterior is to enamel it, as a coating of paint is an effective method of protecting the woodwork from the effects of the relatively cool interior and the hot, dry exterior. Another advantage of the enamel finish is the ease with which the whole can be kept clean. The ice should be wrapped in a piece of clean sacking or cloth, as this is of assistance in protecting it from the effects of the rush of heated air when the lid is opened. *See* Refrigerator.

ICHNEUMON FLY. This insect is beneficial in the garden, as it is destructive to caterpillars and other pests. Actually the flies deposit their eggs in the bodies or eggs of other insects, hatching out larvae which devour the body or egg in which they were developed. The flies may be readily identified by their long, slender, blackish-brown bodies, and are about ½ in. in length. *See* Caterpillar; Insect.



Ichneumon Fly. Useful garden insect which helps to keep down the caterpillar plague.

ICHTHYOL. The drug used in medicine under the name of ichthyol is a dark substance obtained from a bituminous quartz containing the fossil remains of fish. The dose internally is 10 to 30 gr., and the drug proves useful for rheumatism, bronchitis, etc. A convenient way to take it is in tablets containing 2½ gr.

Ichthyol ointment, 5 to 10 or more per cent, spread on flannel is a soothing and heat-reducing application in sunburn, burns, and other inflammatory conditions of the skin.

ICING. There are various kinds of icing, differing somewhat in make and consistency. They include almond paste, butter, or Vienna icing, and fondant, glacé, and royal icing. In some of these the method of application varies, both glacé and fondant icing, for instance, being usually poured over the cake; while butter icing, which is used sparingly because of its richness, is allowed to get hard and cold before use, and then spread over the cake, smoothly and evenly, with the flat of a knife.

If glacé or fondant icing is not used in the manner suggested, the cake is dipped into it and coated in this way. Almond paste or icing is used in a thick layer, which is shaped with the hands before being smoothed with a wetted knife. A little marmalade is used to make the paste adhere to the cake.

Royal icing, for which almond paste frequently serves as a base in rich wedding cakes, is hard and white. It can be coloured pink with a few drops of cochineal, or other colours with vegetable colouring extracts. Only one drop at a time must be used, as these are very strong.

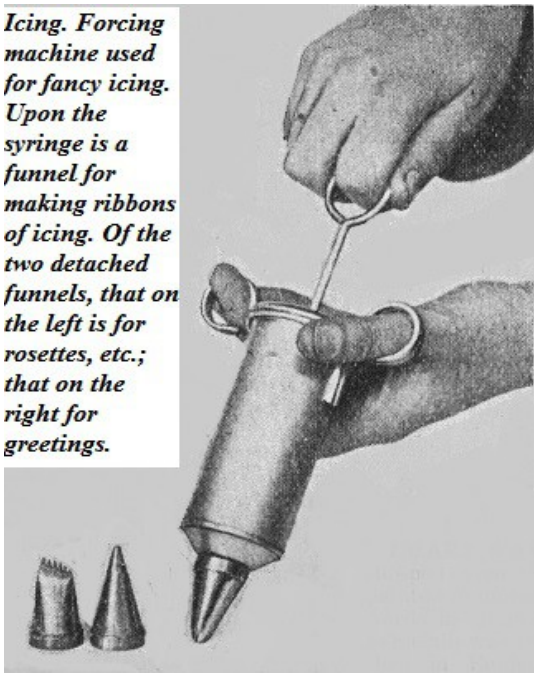
Instructions for making royal icing are given under the heading Cake. Two or three coats are sometimes used in cakes of an elaborate character, but one coat must always be allowed to dry before another one is put on. Large cakes are sometimes iced only on top, the sides being tastefully decorated with ribbon or fringed paper.

Icing on birthday or party cakes may be of one, two, or even more colours and flavours, but if intended for children it should not be too rich. Additional decorations on iced cakes may be supplied by birthday, Christmas, New Year, or other greetings, or any appropriate design, carried out in icing of a contrasting shade. Forcing pipes will be necessary for this process, which, though more difficult than ordinary icing, merely requires careful practice.

The Forcing Pipe. These are made in the form of syringes with detachable funnels of different sizes and designs. If it is desired to ornament the cake with words of greeting, a funnel is placed on the mouth of

the syringe, which has a small round hole. If piping of coloured icing is desired, or a lattice or scroll design, the same funnel is used. A funnel with a serrated edge is used for making rosettes or roses of icing, and a funnel with a flat opening for making ribbons of icing, bows, garlands and other designs.

The icing, which should be of a firm, creamy consistency, not thin enough to run nor stiff enough to stand, should be placed inside the syringe, the handle of which is unscrewed at the top. The syringe is about half filled. The handle, with the pump pulled out as far as possible, is screwed on, and then gently pressed downward. The icing is forced out through the funnel, and takes the shape for which the funnel is designed. A revolving stand is supplied with some icing sets, and this is a great help in icing a cake evenly. The syringe should be held immediately over the spot where the decoration is to fall if roses or rosettes are desired. It should be slanted for writing or ribbons of icing.



Icing. Forcing machine used for fancy icing. Upon the syringe is a funnel for making ribbons of icing. Of the two detached funnels, that on the left is for rosettes, etc.; that on the right for greetings.

If a forcing bag is used, the icing mixture is put into the bag, half filling it, and the funnel pressed through the bottom. The icing is then squeezed by the hand through the opening into the funnel. Royal icing, butter icing, or whipped and flavoured cream, can all be used for ornamenting dishes in this way. Entrées and savoury dishes are sometimes decorated with savoury cream by means of a forcing set.

Glacé Icing. This is made with ½ lb. of icing sugar and about half a gill of tepid water. Crush the sugar and put it into a basin, add the water slowly and stir smoothly but do not beat. The icing should coat the back of a spoon and settle smoothly into that in the basin. If necessary, add a little extra water. Colourings and flavourings, such as vanilla or almond, can be added if it is desired.

For an orange or lemon glacé icing use the strained juice of lemon or orange instead of the water, and colour if necessary with a few drops of saffron colouring.

Feather Icing. This is used when a rough surface is desired on a cake to give the effect of snow. To make it, prepare a syrup from ½ pint of water and 2 lb. of loaf sugar and boil it to 240°F. Then pour it on to the slightly whisked whites of 4 eggs, add any colouring required, and whisk the mixture until it thickens. A smaller quantity can be made provided that the same proportions are maintained. This icing is sometimes known also as mountain icing. *See* Almond Paste; Cake; Chocolate Icing; Coffee Icing; Decoration; Fondant, etc.

Icterus. *See* Jaundice.

Idiocy. Idiocy is extreme mental deficiency which shows itself after birth or develops in very early childhood. *See* Insanity.

ILLEGITIMACY. An illegitimate child is one born out of wedlock. Such children are made legitimate if the parents marry after their birth, provided that the parents were free to marry at the time of the birth. This has long been the law of Scotland and in 1926 it was made the law of England also. An illegitimate child usually takes the mother's name.

The chief disadvantage of an illegitimate child is that he or she cannot inherit anything in case a relative, except the mother, dies intestate and from the mother only if she leaves no legitimate issue. Illegitimates must pay legacy duty on money they do inherit at the same rate as strangers in blood, but they are recognized as dependents under the Workmen's Compensation Acts.

The mother of an illegitimate child can compel the father to pay towards its maintenance. A child of a married woman is regarded as legitimate even if the father is not her husband, the law being that such is born in wedlock. The law, however, can declare such a child illegitimate if the husband can prove that it is not his. *See* Affiliation Order; Child; Father; Income Tax; Mother.

I LOVE MY LOVE. This is an old game, and can be played anywhere with any number above two. It consists merely in filling in a form of words with the necessary epithets, all of which must begin with the same letter. The form runs as follows: I love my love with an A because he is amiable; I hate him with an A because he is argumentative. He took me to the sign of the Arrow and fed me with anchovies and asparagus. His name is Archibald and he lives at Angmering.

When one person has done this satisfactorily the next takes up the tale, either repeating it with A and supplying a different word for each epithet, or, if preferred, continuing with B. The game goes on until the entire alphabet has been exhausted. X is omitted, and Z will seldom last for more than one player. It can be played either in the masculine or feminine gender.

IMARI WARE. The Japanese porcelain shipped from the port of Imari was at first painted in underglaze blue on white, and afterwards in enamel colours and gold. This old porcelain was freely copied in Delft ware, and then in English china, especially at Bow, Derby, and Worcester. Chrysanthemums, peonies, and other boldly drawn and richly tinted blossoms, often highly conventionalized, with dragons, birds, and diaper patterns, are favourite styles. They are painted in grass-green, dull red, lilac-blue and gold. Modern Imari does not equal the old ware, which fetches very high prices, but it is an effective foil to other Eastern furnishings, especially the beakers, square vases, and shallow dishes. Imitation Chinese marks are sometimes used. There is much inferior work, both old and new. *See* China.

Immortelle. This is an alternative name for rhodanthe. *See* Everlasting Flower.

IMPEDANCE. This is the opposition offered to the flow of an alternating current round a circuit, and is dependent upon the values of resistance, capacity, and inductance. Impedance varies with the frequency of the alternating current, except in cases where the circuit constitutes only a pure resistance. Impedance is expressed in ohms.

IMPERIAL DRINK. For feverish patients a beverage known as imperial drink is often prescribed. One simple method of making it is to add cream of tartar to freshly made lemonade in the proportion of a teaspoonful to the pint. The following is a usual recipe:

Saccharin	1 gr.
Oil of lemon	3 minims
Potassium tartrate	1 dram
Boiling water to make	1 pint

Another recipe consists of ½ oz. cream of tartar, the rind of a lemon, a heaped teaspoonful of sugar, and 3 pints of boiling water.

IMPETIGO: A Skin Disease. Impetigo is a highly contagious inflammatory skin disease, characterized by the formation of scattered blisters on the skin, which become filled with matter and dry into crusts. The face, particularly about the mouth, is the commonest site of the disease. There is little or no itching. The disease is chiefly noted among poor and dirty children.

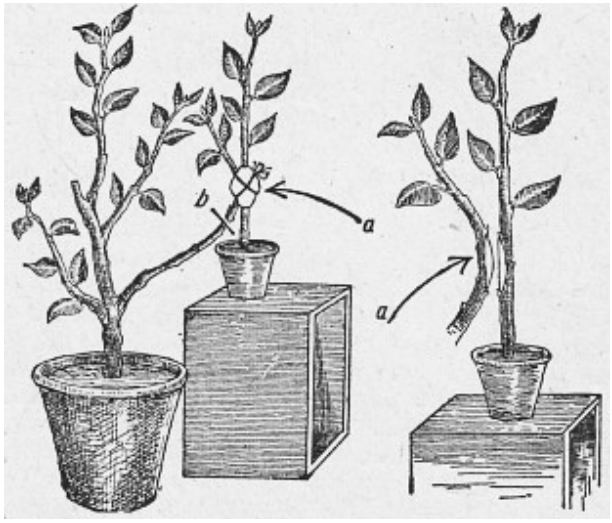
The crusts should be softened and removed with soap and warm water, or, if necessary, by soaking with oil or applying starch poultices, after which the following ointment may be applied to the patches:

Ammoniated mercury	5 gr.
Petrolatum	1 oz.

To prevent new crops of blisters appearing an antiseptic lotion should be frequently sopped on the affected skin and adjacent areas, e.g. saturated boracic solution or corrosive sublimate lotion (1 in 3,000).

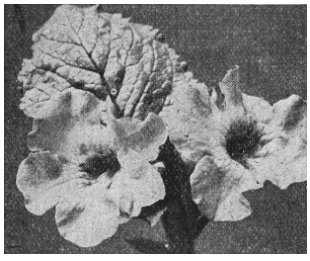
INARCHING: Of Plants. This is a form of grafting which is not often practised in gardens. It is useful, for example, if it is wished to replace a worthless grape vine with a better variety without disturbing the roots of the former.

The method is as follows: A vine in a pot of the variety wanted is purchased. When growth has started in spring the pot must be raised so that the fresh green shoot can be brought into contact with another green shoot on the old vine. A piece, ½ in. to ¼ in. deep and about 2 in. long, is cut out of the side of each green shoot, the two shoots are tied together with raffia so that the cut surfaces are in contact, and finally the raffia is covered with moss, which must be secured in position.



Inarching. Left, young and old plants joined together; a, bandaged junction; b, where to divide when cohesion is established. Right, showing at a, preparation of stock and scion.

The moss is kept moist by syringing. If the work is successful the two shoots will unite. When it is obvious that union has taken place, during the summer the stem of the young vine should be severed very gradually just below the green shoot. Subsequently, as the new variety of vine makes vigorous growth, the shoots in the old vine can be rubbed off gradually, and eventually the branches may be cut away, leaving the new variety firmly established on the old stock.



Incarviliea. The rose-red trumpet-shaped flowers of this hardy herbaceous plant.

INCARVILLEA. This plant has thick brittle roots, large leaves and trumpet-shaped flowers in summer. The favourite is Incarvillea Delavayi, with rose-red blooms. It should be planted in well drained sandy, loamy soil in a sunny place. In cold districts the

soil over the roots should be covered with old ashes in autumn, when the leaves have died down. If an increased stock is desired it is best to sow seeds in a frame in spring.

INCH. For ordinary purposes the inch is the smallest measure of length, though for special purposes, scientific and other, it is divided very considerably. Twelve inches go to a foot, and the standard inch of the United Kingdom is 1/36 of a yard. 144 square inches make a square foot and 1,728 cubic inches make a cubic foot. For it the usual abbreviation is in., which is used throughout this work.

INCINERATOR. The best method of dealing with household refuse, which is usually placed in the dustbin, is to burn it on the kitchen fire. In the hot weather the range or independent boiler may be out of use, so that some other way of consuming the refuse must be arranged. In such a case the best way is to destroy it in an incinerator. In one type, which may be installed in kitchen or scullery where a flue is handy, the heat is provided by gas. An incinerator of this kind is perfectly safe to work, and needs no attention beyond feeding in the refuse, giving it an occasional poke, and afterwards emptying the ash. By this agency refuse, wet or dry, tea leaves, egg-shells, vegetable stalks and scraps, rags, cooking waste, etc., can be converted quickly into a relatively minute quantity of ash. This can be deposited in the dustbin or used in the garden as a fertilizer. The use of the appliance for half an hour daily will dispose of all the domestic refuse and the cost for gas in negligible.

A galvanized iron incinerator is handy for use out of doors. It is a cylindrical structure resembling a dustbin, and having a grating, lid, and central flue. A fire is kindled with paper, etc., and the refuse, is placed inside. *See* Dustbin; Gas; Refuse.

INCOME TAX: THE LAW EXPLAINED

How the Taxpayer can Compute His or Her Liability

By the help of this article income tax payers can see for themselves the amounts they are liable to pay. Other articles that deal with the financial liabilities of the householder include Employers' Liability; Rates. See also Insurance; Surtax.

This is a tax of so much in the £ on every £ of income, with certain allowances intended to relieve small incomes. In addition to the income tax proper a surtax is levied on larger incomes, i.e. those over £2,000 a year.

In Great Britain the existing scheme provides for a certain amount of income being free from tax, for the payment of a lower rate on the next £135, and for the payment of the full rate on the balance. In addition, there are various allowances and abatements, so that the actual rate of tax varies, not only with the income but with the responsibilities of the payer. In fact it can be said that each payer has his own rate of tax.

The tax is in most cases payable in two instalments, due on Jan. 1 and July 1 during the year following the one in which the return is made. Weekly wage earners (manual labour) are assessed ½-yearly and pay tax every ½-year. This concession does not, however, extend to journalists, clerks, typists, and others, even if they are paid weekly. If the income for the year in question cannot be ascertained exactly, a provisional return should be made and the matter adjusted at the end of the period, or as soon, as possible.

The Procedure. To ascertain his liability the taxpayer must know the rate of tax and the amount of his taxable income, this being his income less certain deductions. In 1938 the standard rate, as it is called, was 5s. 6d. in the £. It had been raised in 1930 from 4s. to 4s. 6d. and in 1931, the year of the financial crisis, to 5s. In 1934 it was reduced to 4s. 6d., and in the budget of 1937 increased to 5s. The first £135 of taxable income was, from 1935, charged at ⅓ of the standard rate instead of ½, but for 1938 the reduced rate, as it is called, was continued at 1s. 8d. from 1937. In April the taxpayer should ascertain his total income for the year ending on April 5 and fill up the form which is sent to him. If this is accepted as correct by the authorities, he will receive a demand note for the amount, which he must pay during the following year. If his return is not accepted, the authorities may ask him to make another one or to present them with certain explanations. They may, too, assess his income at a figure higher than the one he returned and leave him to prove that it is incorrect. Appeals must be made within 21 days of the issue of the assessment notice (generally sent in the autumn).

The Five Schedules. The income must be entered under one of the five schedules or classes shown on the form. Of these A relates to income from land and house property in Great Britain and Northern Ireland and includes the annual value of the house in which its owner lives. B relates to income from the occupation of land and is charged on the annual rental value. This chiefly concerns farmers, who, if they prefer, can be assessed on their actual profits for the year preceding. C relates to income from War Loan and other securities, the interest on which is paid out of public funds.

The majority of taxpayers probably pay, as far as the bulk of their income is concerned, under the two remaining headings. D relates to profits from every trade, profession or vocation, farming excluded, and also to bank interest, loan interest, interest from foreign and colonial securities and on stocks and shares. In this class, therefore, fall the incomes of all who are in business for themselves, and of those having holdings of stocks and shares in public and private companies. In E fall all salaries, pensions, etc., whether paid out of public funds, or by public and other

companies or by private firms.

Reliefs and Allowances. The income ascertained and entered, the taxpayer should next find out what reliefs and allowances he can claim, and by deducting these from his total income he will obtain what is known as his taxable income. As matters stand (1938):

The taxpayer can get relief for the part of his income that is earned, earned in this sense including pensions. This is an allowance of one-fifth of the income; but total relief must not exceed £300, unless taxpayer is over 65.

No income tax is payable on the first £125 of assessable income in the case of a single person or on the first £180 in the case of a married man living with his wife, or wholly maintaining her. This makes all incomes under these amounts free from tax. No tax is payable on wound and disability pensions granted to persons who served in the Forces during the Great War, or on war gratuities, or on educational scholarships, and exhibitions, even if they exceed the limit of £125. Casual and occasional profits and gains, such as that from a sweepstake or from a deal in shares, are not liable to tax, neither are gifts and annuities not payable under a deed. In the case of gifts of this kind the tax is borne by the payer, who gets no allowance for such.

For purposes of income tax the incomes of husband and wife are added together, unless application is made for separate assessment. If a wife earns an income her husband is entitled to an abatement thereon of a sum equal to four-fifths of the amount of such earned income, but the relief is limited to £45. In other words, a married couple in this position can claim relief up to £225 instead of £180.

The next relief is for children. There is an allowance of £60 for each child. Such children, however, must be under the age of 16 on April 6 of the year for which the claim is made, except in the case of those who are in full time attendance at school or college, for whom there is no age limit. This allowance cannot be claimed for any child who has in his or her own right an income of £60 a year or over. Child in this sense includes a stepchild and an adopted child, if such child is maintained by the taxpayer.

Allowances for Dependents. Allowances are also made for dependent relatives. One of £25 is granted in respect of any relative who is dependent on the taxpayer or his wife, provided that such dependent is incapacitated by old age or infirmity from maintaining himself or herself and that his or her income from all sources does not exceed £50 a year. If two or more sons or daughters join in maintaining a dependent they are entitled to divide the relief of £25 between them. When the dependent relative is a widowed mother the condition of incapacity is waived. The same relief is granted for a daughter on whose services the taxpayer depends by reason of old age or infirmity.

Allied to this is the allowance granted to widows and widowers for a housekeeper. Relief to the extent of £50 is granted to a widower in respect of a female relative or some other female who resides with him for the purpose of looking after his children. A widow in a corresponding position can also claim it. If an unmarried person has living with him a widowed mother or any other female relative maintained by him to look after his brothers and sisters he can claim an allowance of £50.

An allowance is also granted for premiums on life assurance policies. This amounts to an allowance of 7 per cent on the capital sum insured, up to one-sixth of the total net income from all sources, on all sums paid in premiums on his own life and on that of his wife. It is also allowed in cases where a wife takes out a policy on the life of her husband. There are, however, certain restrictions on this form of allowance.

Trade and Professional Expenses. Allowances are also granted in respect of certain trades and professions. Ordinary tradesmen and other business men are allowed to deduct all the expenses wholly and exclusively incurred for business purposes. The auditors will usually decide what expenses can rightfully be included in this category, but their decisions may be questioned by the Inland Revenue authorities, who may ask for the production of the books of the business. In these cases much depends upon the nature of the business and special circumstances of all kinds; but the authorities will certainly question heavy expenditure that is not proved to be purely for business purposes.

When an individual resides on the premises at which he carries on his business he is entitled to charge against his profits a proportion, normally two-thirds, of the rent, rates and other outgoings incurred in connexion with the said premises. Other traders who conduct their business from their homes are also entitled to an allowance of the same kind.

Medical men, dentists, and those solicitors who do part of their business at home, are also allowed to deduct from the incomes something for that part of their house that is used for professional purposes. In the case of a clergyman or minister of religion an allowance not exceeding one-eighth of the rent or annual value of the house in which he lives is allowed.

Journalists are allowed a certain amount in respect of professional expenses such as the cost of typewriting and stationery. Artisans and others can obtain allowances for expenses on the tools necessary for their livelihood. Expenses incurred in getting to and from one's work are not allowed as deductions from the amount liable to income tax. A commercial traveller, however, can obtain a deduction for expenses of travelling incurred for his business provided no allowance is made to him by his employers for expenses of this kind.

When a person sustains a loss in any trade, profession, or vocation, he can, upon giving notice in writing to the local inspector of taxes, within twelve months after the year of assessment in which the loss is incurred, apply for and obtain an adjustment of his

liability to income tax by setting the loss against his assessed income of the year and bearing the tax on the balance. When such loss exceeds the assessed income the balance of the loss can be carried forward and set off against the income of six succeeding years.

Two Examples. To illustrate the working of the income tax laws two instances may be taken, one very simple and the other somewhat more complicated. A married man with two children under 16 has a salary of £750 a year, his wife has a private income from investments of £40 and himself one of £20. He pays £20 a year in insurance premiums and on this he can claim an allowance of 2s. 9d. in the £, or £2 15s. The total income is, therefore, £810, and the deductions are:

	£
One-fifth of earned income	150
Allowance for himself and wife	180
Children's allowance	120
	450

The taxpayer should therefore deduct £450 from £810, leaving a balance of £360 on which he is to bear tax. Of this £135 is charged at the lower rate of 1s. 8d. in the £ and the balance at 5s. 6d. His total tax will therefore be £73 2 6d., less the £2 15s. mentioned, or £70 7 6d. He has, however, already paid £16 10s., as this amount has been deducted from the dividends or interest paid to himself and his wife, and so the actual amount due from him in cash is reduced to £53 17 6d.

In the other case a professional man returns his earnings at £1,440 for the year. In addition he has a private income of £178, and his wife has one of £260. This gives him a total gross income of £1,878, from which there are various deductions, in addition to the main ones of one-fifth of his earned income and £180 for himself and his wife.

This professional man has three children; one son is over 16 years of age, but as he is still at school the father can claim an allowance for him. He contributes £100 a year to the support of his widowed mother, so can claim relief on £25 in respect of this payment.

His abatements and allowances may be summarized thus :

	£
One-fifth of earned income	288
Self and wife	180
Three children	180
Dependent mother	25
	673

This amount is deducted from the total income of £1,878, making his taxable income £1,205. He pays 1s. 8d. in the £ on the first £135 of this and 5s. 6d. on the balance of £1,070. Thus he is liable for a payment of £305 10s., but as he has already paid, by deduction at the source, £120 9s. on the incomes of himself and his wife, he need only find in cash £185 1s.

Taxing at the Source. In these two cases and in many others the taxpayer does not actually himself pay over the whole of the tax due from him. This is due to the fact that he may obtain part of his income from interest and dividends of various kinds.. These unearned incomes, and also certain classes of earned incomes, are taxed at the source, or before they reach their owner. In other words, the company pays the tax direct to the national exchequer and deducts it from the amount of the dividend.

The same is done by the Bank of England and other banks when paying the interest on consols, War Loans, corporation stocks and other securities of that kind, and also by those who pay interest on mortgages. The only exception is one or two of the War Loans, on which interest is paid without deduction of tax, leaving the recipient to pay the tax if he be liable. The holder of stocks and shares is required to show income on which tax has been deducted in his declaration of income to the tax authorities, but obviously he is not required to pay a second time.

The principle is exactly the same when a company pays its dividends free of tax, as it is called. This simply means that it is paying a higher rate of dividend. To take a simple example: a company that pays 5 per cent free of income tax is really paying something over 6 per cent gross, when the rate of tax is 5s. 6d. in the £. The gross dividend inclusive of tax must be entered on the return by the taxpayer. He must not enter £10, or whatever sum he actually receives, but that sum plus the amount deducted.

In the case we have assumed, that sum is £13 15 10d., because tax on £13 15 10d. at 5s. 6d. in the £ is £3 15 10d., which leaves a balance of £10 for the taxpayer to receive. He is really taxed, therefore on £13 15 10d., and this is the amount of income which he is assumed to have had. This matter is important from the point of view of the Inland Revenue authorities, as the larger amount will, in certain cases, make incomes, otherwise free, liable to surtax. It is also important for a taxpayer who claims repayment because he is entitled to reclaim tax on £13 15 10d., instead of on only £10.

Claims for Repayment. These deductions from income are obviously made irrespective of the amounts of the incomes of the various persons concerned, which amounts those making the deductions cannot possibly know. Hence it comes about that many persons with small incomes, e.g. all those below £125 a year and those who, although they have incomes above that amount, are entitled to allowances of various kinds that are equal to or greater than the income itself, find, when they receive their dividends, that they have paid a tax from which legally they are free. Others who are liable to pay something find that they have paid more than they should have done. For instance, a man may be liable for a tax of £10, but £20 may have been deducted from his dividends. Cases of this kind are very frequent.

To remedy this effect of deduction of tax at the source provision is made for returning the excess of tax so deducted. Persons, therefore, who have paid more than they are liable for should take the following steps

to recover the amount, whether they are totally exempt from tax or only partially so. Immediately after the end of the year, which for this purpose is April 5, a claim for repayment should be forwarded to the local inspector of taxes. For this purpose a special form is provided, which can be obtained from the inspector, whose address will, if required, be given by the local collector. This form should be filled up carefully, all the particulars required being clearly entered. It should then be sent to the inspector for examination and verification. Questions may be asked about one or more of the items, but if the claim is in order the overpaid tax will be returned in the course of a few weeks. No claim will be admitted unless it is made within six years from the end of the year to which it relates. This is an important proviso.

Sending in the Claim. With this claim should be forwarded the vouchers which are sent with dividend and interest warrants, certifying that the tax in question has been paid. For other kinds of income the authorities will require receipts and letters from the payers certifying that the amount stated has actually been paid by them to the revenue authorities. Repayment will be made, if desired, in instalments as sufficient taxed income is received, without waiting for the full income of the year. The ordinary tax demand is usually sent in December.

Relief from Double Income Tax. A certain measure of relief is allowed to persons who are liable to two income taxes on the same income, provided that the two income taxes are charged within the British Empire. For instance, a man may reside in England and receive most of his income from property in Ontario. In such a case the taxing authorities in London will allow relief from the tax charged in Great Britain as the tax has already been paid in Canada. The relief thereon will be at the Dominion rate in the £, or at one half of that person's appropriate rate of tax in Great Britain, whichever be the less.

This arrangement covers the case of the Irish Free State, which, since it came into existence in 1922, has levied its own income tax. On its part the Free State has laid it down that from April 6, 1923, income tax will be deducted from dividends and interest on the stocks, shares, bonds, etc., of any government and company, outside the Free State, including British Government securities, where payment of such dividends and interest is made by or obtained through a bank, paying agent or other person in the Free State.

Exemption from Irish Free State income tax in respect of such dividends or interest is, however, allowable when the owner of the stock, shares, etc., is not resident in the Free State or, in the case of those British Government securities which were issued exempting them from taxation of this kind, where the beneficial owner is not ordinarily resident in the Free State; and payment of the dividends or interest without deduction of Irish income tax can be obtained by persons entitled to such exemption upon the completion of declarations on the correct forms.

The Free State has decided, too, that no deduction of tax will be made from interest on holdings of 5 per cent war loan, 5 per cent national war bonds, 4 per cent war loan, tax compounded, and 4 per cent national war bonds, tax compounded, registered or inscribed on the books of the Bank of Ireland in Dublin; but such interest will be charged with the tax by direct assessment on owners liable to income tax levied by the Free State.

Protection for the Taxpayer. A society exists for the protection of income tax payers, and its officials are willing to give expert advice to persons who are unable to recover overpaid income tax and to those who have difficulties with their assessment. Advice on these and kindred matters is also given for a fee by accountants, some of whom specialize in this subject, and by agencies that make a business of recovering overpaid income tax. In the great majority of cases, however, the taxpayer can deal with these matters himself, and any information and assistance he requires is usually given quite willingly by the inspectors and other officials who are responsible for collecting the tax. In case of serious dissatisfaction with his assessment he can appeal to the commissioners, and, from their decision, to the courts of law.

The Income Tax Payers' society, Abbey House, 2, Victoria Street, London, S.W.I, was founded in 1921, and is a non-trading concern. In addition to safeguarding the interests of taxpayers in general, it offers to its members, in consideration of the payment by them of a nominal annual subscription, the advice and assistance of its staff of experts on all matters relating to the law and practice of income tax. It publishes a quarterly Journal which is posted free of charge to all its members and which contains technical and other useful information likely to appeal to every taxpayer.

Incontinence. *See* Enuresis.

INCUBATORS AND THEIR MECHANISM

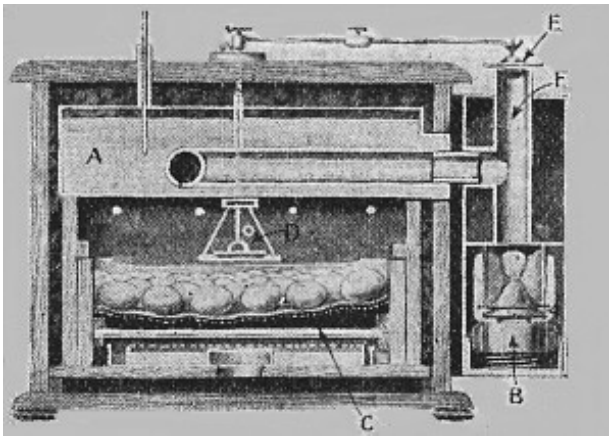
Care and Attention Needed to Secure the Best Results

As the keeping of poultry is a domestic industry, our work contains many articles of interest to the poultry keeper. Such include Brooder; Poultry House. See also Chicken; Duck; Eggs; Fowl; Poultry, etc.

The mechanical stages in the use of a hot water incubator are as follows, assuming that the instrument is in perfect working order: First the water container is filled with hot water, until it runs out of the overflow pipe or appears at the top of the filler pipe. The lamp reservoir is then very nearly filled with kerosene oil of good quality, the wicks adjusted so that the flame burns brightly without smoking, quite steadily and quietly, and generally about ¾ in. in height.

The lamp is inserted in place under the flue opening. To do this the spring base has to be depressed to allow the lamp glass to pass the top of the opening in the chamber. The resultant spring upon it forces the lamp upward, and the top of the glass makes contact with the bottom of the flue and thereby prevents any air getting into it except through the air passages in the burner and the independent air supply separately provided.

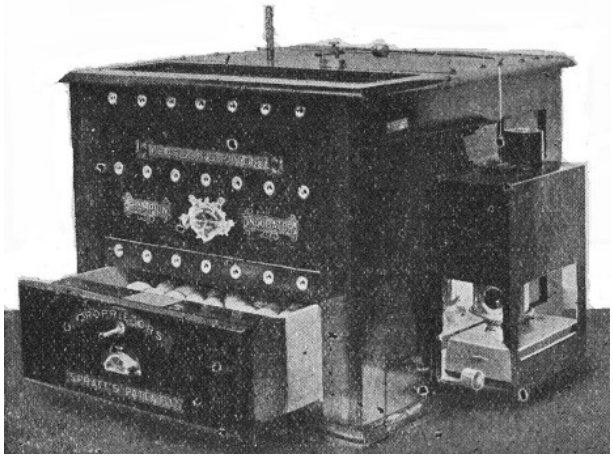
The egg drawer is then closed and the thermometer inserted into place. The accuracy of the thermometer should be tested against another of known exactitude, and, if satisfactory, may be put into service. The lamp is then left burning day and night, until the temperature has risen to about 104° F., at which temperature the capsule should expand and lift the control lever. This control lever has, on its outer end, a cap or disk, which hangs over one of the hot-air flues, with the result that when the cap is down, the whole of the hot air will pass to the hot-air chamber and water container, and then be carried into the atmosphere.



Incubator for hatching hen's eggs. A, water tank, heated by lamp, B. C, egg tray with, beneath, water tray to keep air moist. D, thermostatic capsule, which expands at a prearranged temperature and, by means of a rod and lever, raises damper, E, from chimney, F, permitting hot air to escape without passing through incubator. When temperature drops, capsule contracts and lowers damper. (Courtesy of Spratts Patent, Ltd.)

When the cap is lifted by the lever and expansion of the capsule, some of the hot air can escape direct to the atmosphere; and consequently the temperature of the incubator falls a few degrees, the capsule contracts, the lever falls, and the cap is automatically replaced at the top of the flue opening. The critical adjustment of the capsule regulating screw governs the temperature at which the lever will rise. By screwing or unscrewing it the lever is raised and lowered. A sliding weight is also used on the lever bar, because with the increase of temperature not only does the capsule expand, but the pressure in it increases with further increase of temperature, hence the moving weight is useful; as by sliding it along the lever a fine adjustment is possible. This will have to be made on the spot for each individual incubator, and the incubator should be run for a sufficient period until the temperature remains constant for 48 hours before the adjustments can be considered safe, as with a hot-water incubator of this type several hours must necessarily elapse before changes of temperature become apparent.

Preliminary Experiments. **The water tray will have to be refilled with water from time to time, and various other operations performed when the incubator is at work, according to the period of incubation. When adjusting the incubator for the first time, it is as well to open the drawer occasionally, as if about to turn the eggs, and for about the same length of time requisite to do this, so that an appreciation of the temperature change and the time it takes to recover the normal hatching temperature is ascertained, as a knowledge of this item is very important during the actual hatching.**



Incubator. This apparatus has an egg capacity up to 120 hen eggs. The water tank is heated by an oil lamp which is controlled by a thermostat. (Courtesy of Spratt's Patent. Ltd.)

The care and attention that should be given to any incubator includes the placing of the incubator in a dry position where the temperature can be maintained at an equable degree. This is a very important matter, as much of the success of incubation depends on the incubator itself being placed in some situation where it will be free from draughts or any violent change of temperature. The incubator should stand upon a firm support, either upon four stout legs with a framework, or upon brackets or any other arrangement that is firm and entirely free from vibration. This is a matter requiring careful attention.

As regards the apparatus itself, the only attention during the hatching period is to refill the lamp and see that the wicks are clean and in good order at regular intervals, say, about every 24 hours. After the lamp has been in use for some time, remember to see that there is sufficient wick to reach well to the bottom of the container, otherwise the lamp may go-out unexpectedly. The asbestos or other washers used to make the airtight joints around the inspection glass and the base of the flue should be examined, and if worn or broken be replaced by new, as any ingress of cold air at those points tends to reduce the heating

value of the lamp.

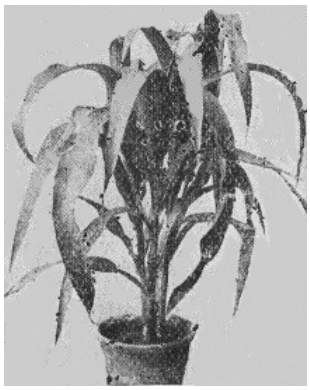
The internal air passages, or flues, should be cleaned out from time to time with a stiff-bristled brush with a flexible handle. The regulation of the capsule has already been described, and when it is functioning properly it should not be disturbed, as it depends upon chemical action for its functioning, and the action will always take place at the same time in every case. Therefore, when the regulator is properly adjusted it is best to leave it alone, except to see that the pivot bars have not worn and to keep them slightly oiled, so that they may work perfectly smoothly.

If it is desired to vary the temperature, as, for example, at the beginning or near the end of the hatching, the lead adjusting weight may be moved in preference to altering the adjusting screw for the capsule. The drawer, egg tray, water tray, and drying compartment should be kept scrupulously clean and be washed out between every hatch, preferably with hot water, with a small addition of disinfectant, followed by a washing in clean water.

The outside of the cabinet will keep in better condition by the application of a little furniture polish or an oily rag, as this preserves the wood in good condition and makes it less susceptible to atmospheric changes. The little air vent holes should be kept clear, and the water tank examined and the water-level tested between each hatch, making good the deficiency with hot water. After a year's hard work, the water tank should be emptied to free it from sediment which might accumulate.

INDIAN CLUB. The practice of various exercises with Indian clubs helps to develop the chest and the muscles, and enables the performer to acquire an erect and graceful carriage. The exercise or drill is well adapted for musical accompaniment if desired. In shape the Indian club resembles a slender, long-necked bottle with a knob at the end. These clubs are usually made of willow or elm. The wrist plays an important part in the exercises, which consist of a series of twists and swings. The clubs are made to turn in circles by the wrist action while they are swung from the shoulders with wide, sweeping movements to right or left. There is an outer and an inner swing. In the former the clubs are raised and swung downward away from the body and back to the starting point; in the latter the swing is upward.

INDIAN CORN. The variegated-leaved variety of Indian corn or maize (Zea Mays) has long been a popular plant for use among others in summer flower-beds, but improved varieties of the common kind are being increasingly grown for the sake of the cobs, which are cooked in the way described in the article on Maize. This plant needs rich, deep soil and copious watering in hot weather. Seeds may be sown under glass in March and the seedlings set out of doors in May, or seeds can be sown out of doors in the latter month. The rows should be about 2 ft. apart, and the seedlings thinned to 10 or 12 in. from each other. *See* Maize.



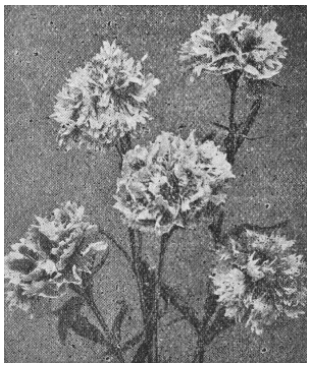
Indian Corn. Leaves of the variegated maize, a plant much grown for its decorative value.

INDIAN CRESS. This is a popular name for the common or garden nasturtium. It is a familiar and easily grown annual which bears showy flowers in many shades of red, yellow, orange, starlet, and terra-cotta. There are dwarf and climbing varieties. *See* Nasturtium.

Indian Fig. Popular name of the Opuntia cactus (q.v.).

INDIAN GRASS. This is a hardy perennial grass of pretty tufted growth, attractive in mixed borders, its Latin name is Molinia caerulea. It will grow in good ordinary soil, in any position, and may be planted from March to June, or during autumn. It bears smooth, rigid leaves of delicate green, variegated with white, 8 to 12 in. in height. Propagation is by simple division of the roots in spring or autumn. *See* Border.

INDIAN PINK. This is a popular name of Dianthus chinensis, known also as Chinese pink, a favourite summer flowering plant with large fringed blooms in many colours. It is commonly treated as a biennial. Seeds are sown out of doors in June, the seedlings being transplanted once to give them room for development: in October they are put out where they are to bloom the following year. Well-drained soil and a sunny situation suit them best. From seeds sown in a heated greenhouse in January or early February the plants will flower in the summer of the same year if planted out of doors in May or early June.



Indian Pink. Flower heads of the double variety.

Indian Shot. Alternative name for the canna, a large and handsome summer bedding plant. *See* Canna.

INDIA-RUBBER PLANT. This is the popular name of Ficus elastica, a favourite room and window plant with large, handsome deep green leaves. The variegated leaved variety is even more attractive. Both thrive if potted in a compost of sandy loam. Careful watering is necessary, as with all room plants. When

the soil is just moderately dry the pot should be filled to the rim with water. An occasional sprinkling of guano or watering with soot water has a beneficial effect on the growth of the plant.

INDIGESTION. Pain or discomfort is caused to many persons in consequence of a disturbance of digestion in the stomach or bowels. This may assume an acute form, with headache, nausea, vomiting, and severe pain in the stomach. If the vomiting is not free, the stomach may be relieved of its contents by tickling the back of the throat and giving large draughts of tepid water. The bowels should also be cleared, and for this purpose ½ oz. of Rochelle salts or 2 oz. of compound mixture of senna (black draught) may be taken. The pain over the stomach may be relieved by a hot-water bottle or by a large mustard plaster.

No food should be given for at least 12 hours, but warm water with from time to time a pinch of bicarbonate of soda in it may be given. Milk, diluted with hot water, soda water, or lime water, may be commenced if the stomach has properly settled; then beef tea, chicken soup, steamed white fish, and so on to ordinary diet.

In the chronic form of this complaint, as in the acute, it is necessary always to bear in mind the possibility of the stomach symptoms being due to some disorder of the digestive apparatus calling for special treatment, or to some general disease. When dyspepsia begins in a middle-aged person whose digestion has hitherto been quite good, medical advice should be obtained.

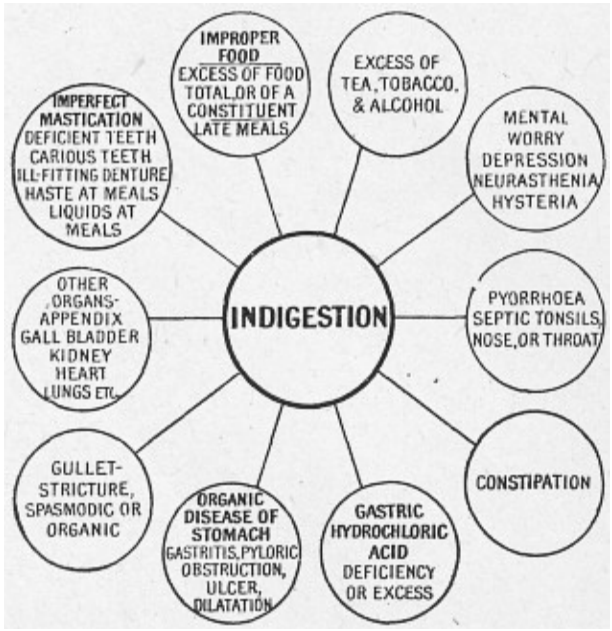
Causes and Prevention. In most cases if inquiry is made as to the state of the mouth, and the habits are brought under review, fairly obvious reasons can be found for the protests which the stomach is making. The mouth is often very septic, and this is responsible for a variety of mischief. Not uncommonly in people who suffer from chronic catarrh of the nose, pus is continually being discharged from the back of the nose and is then being swallowed.

The teeth may be too few for the mastication of ordinary food, leading to the free use of liquid at meals to make the swallowing of the large, partially chewed masses possible. The same result will follow when, either from hurry or reading at meals, sufficient care is not taken to reduce the food to a soft, semi-liquid pulp. The strain on the stomach is increased in the case of the man who feeds with his eyes always on the clock. For half an hour after a meal other functions should be made to go easy. If circumstances dictate a hurried meal it should be small and easy to digest. Taking a meal dry and leaving any beverages to the end greatly helps to promote better mastication. Reading at meals tends to reduce adequate mastication.

Meals should be regular, and casual food between meal-times is to be deprecated. Many people err by taking too many meals, or, even if they take a reasonable number, they load themselves with too much food. The manner in which food is cooked is important. It may be said that things that are fried, that is, cooked in super-heated fat, may strain the digestive powers too much, and the same applies to meats stewed in the ordinary way in a saucepan or baked in pies. All such, and pastries of any kind, should be eschewed by the dyspeptic. Grilling and roasting, or stewing by the French method on a water bath, are the methods which favour digestibility. Pork, salt or corned meat, cheese (unless of the mildest description), shell fish, nuts, pickles, vegetables if fully grown and tough and stringy, new potatoes, and new bread will do harm.

Intemperance in tea, coffee, tobacco or alcohol may be responsible for dyspepsia. The diet should be as varied as it is possible to make it, and should include some fresh food, tender salad, and a little fresh, ripe fruit if possible, avoiding plums and the stringy parts of oranges. But if these disagree a frequent ration of squeezed orange-juice should be taken for the sake of its vitamins.

The general causes of indigestion are set forth in Fig. 1. In neurasthenic cases symptoms are very variable.



Indigestion. Fig. 1. Inefficient chewing and improper food are the commonest causes of indigestion, but there are many other causes, set out in the above scheme. Note that indigestion may be only indirectly due to the stomach, the prime cause lying elsewhere.

Importance of Avoiding a Chill

It is important to keep the abdomen warm, and much benefit may be derived from wearing a flannel binder, especially in cold and in damp weather. The feet should also be kept warm, and this fact applies very especially to infants and young children. The general fitness should also be advanced by a sufficiency of open-air exercise. The bowels should be kept regular, and for this purpose one of the preparations of cascara or aloes may be employed. Where there is much distress after a meal a small teaspoonful of the following powder may be taken in a little milk 20 min. before or half an hour after meals:

Bismuth carbonate	2 drams
Sodium bicarbonate	2 „
Magnesium carbonate	4 „

If flatulence tends to be a troublesome symptom, a wineglass of peppermint water with a pinch of bicarbonate of soda or 1 or 2 soda mint tablets will relieve it.



Indigestion. Fig. 2. Food may not be properly masticated unless attention be given to the matter. For this reason reading at meals is discountenanced; it may lead to bolting of food.

It is not infrequent for pain to come on in the night. This is known as the hunger pain, and it may be relieved by taking a teaspoonful of bicarbonate of soda or of this combined with bismuth. But as this symptom is characteristic of an excess of hydrochloric acid in the gastric juice, with which a duodenal ulcer is apt to occur, anyone who suffers in this way should put himself immediately in the hands of his doctor.

When bottle-fed babies are not digesting their milk well, as shown by the appearance of curdled milk in the stools, 1 grain of sodium citrate may be added to each 1 oz. of milk used. In older children the starch and sugar consumed may have to be reduced, and a meal or two of Benger's Food each day may be a useful way of meeting any difficulty in digesting starch. Flatulence may be relieved by sips of hot water, a teaspoonful of dill water, or a crushed soda mint tablet. *See* Constipation; Diet; Digestion; Eating; Hydrochloric Acid; Stomach, etc.

INDIGO. The blue dye known as indigo produces a dark blue colour on woollen cloth that is fast to light, and on this account the dye is used for all the dark blue cloth employed in the Navy and for dress materials and suitings, etc., of the better qualities in the shade known as navy blue.

The dye bath is a mixture of indigo, lime and fermentable substances such as bran. In this form a colourless liquid is formed. After cloth has been soaked in the dye bath, it is exposed to the air and the blue colour develops. Much of the indigo now used is prepared artificially. *See* Dyeing.

INDIGOFERA. The indigo of commerce is supplied by Indigofera tinctoria, an East Indian plant. Few species of indigofera are grown in gardens; the most important is gerardiana, a shrub which bears rose-red, pea-like flowers in late summer. It is often planted against a sunny wall, where it will reach a height of 10 ft. in the course of time. If planted in the open garden the branches should be cut down each spring to force the development of fresh ones which will reach a height of about 3 ft. Often the branches are cut down by frost. This shrub thrives in ordinary soil in a sunny place and is increased by cuttings inserted in pots of soil in a frame in September.

INDUCTION. When a body charged with electricity produces an electric condition in a neighbouring body not directly connected with it the result is termed induction. A similar effect is observed if the body be charged with magnetism, in which case the magnetic condition is induced in the neighbouring body. Should an electric current be flowing through a conductor, it will induce electricity in another wire brought near.

In internal combustion engines the word induction is used to describe a phase of the suction stroke, and particularly refers to the state of affairs which exists in the pipe or passage connecting the cylinder to the carburettor, generally known as the induction pipe. The difference between the pressures in the cylinder and the carburettor induces a flow of gas from the carburettor to the cylinder. *See* Internal Combustion Engine.

INFANT. In English law an infant is one under 21 years of age. An infant is not held responsible for all his actions; for instance, contracts made by him to repay money or pay for goods are void unless they are for necessities. The definition of a necessity depends on the social position of the infant. An infant is not liable to pay a bill of exchange, even if it has been drawn for necessities.

An infant under seven is not capable of committing a crime in the eyes of the law. It is an offence to send printed matter to infants inviting them to borrow money or to bet. Infants cannot act as trustees or executors, nor be made bankrupt. In an allied sense the word is used for a baby. *See* Baby; Child; Guardian; Juvenile Offender.

INFANTILE PARALYSIS. The infectious disease named acute poliomyelitis is more generally known as infantile paralysis. It is a serious and not uncommon complaint in childhood, especially during the first three years. The onset may be sudden, with headache, vomiting, fever, and perhaps convulsions. After a few hours, in some cases, the child shows evidence of paralysis, involving the limbs, and perhaps the trunk. The paralysis passes away from the greater number of muscles, but remains permanently in one limb or part of a limb, sometimes in two or more. The paralysed limb becomes shorter; deformities such as club foot may be produced, and the limb is blue and cold.

The disease most commonly occurs in the hot summer months. It is due to the entrance of a germ into the body, the source of which is not quite clear. It may occur in epidemics, and when this is the case milk should be boiled. All cases of this disease should be isolated. Treatment will be in the hands of the doctor. Paralysed limbs must from the beginning be placed in position which will avoid any stretching of the muscles, and the doctor's directions on this head must be

carefully followed.

After the acute stage has subsided, and the degree of the residual paralysis is fully determined, an endeavour must be made to re-educate the muscles of the limb which still have the power of contraction. Thus if a leg be affected the child may require to be taught to walk again by means of a wheeled walking machine which he propels. Surgical appliances and instruments are of great value in enabling the affected joints to be moved, and in some cases great good can be achieved by orthopaedic surgical operations.

INFECTIOUS DISEASE. Any disease which is transmissible from one person to another is said to be infectious. Some infectious diseases, such as tuberculosis and ringworm, may be derived from the lower animals. A disease is infectious because it is due to a living organism which can multiply in or about one person, and be discharged and become parasitic in or on another person.

Some parasites, like those of a common cold or influenza, are discharged in the breath, especially when coughing or sneezing, and in such diseases as tuberculosis and pneumonia the sputum teems with organisms which may be dispersed by coughing, or as a fine dust when the sputum dries. The dried crusts of smallpox and chicken-pox are infective, and their dust contaminates the air.

The parasites of other diseases, such as typhoid fever, dysentery and cholera, are chiefly spread by contaminated water, and these are therefore often described as water-borne diseases. Not only may infection come from drinking such water, but from utensils or fresh vegetables or fruit which have been washed with polluted water. Milk may be charged with parasites by being kept in such vessels, or by dilution with the water. Icecream may also convey infection.

Other insects convey infection when they bite; or infected faeces of an insect may be inoculated into the skin by scratching. By the last method typhus, relapsing fever and trench fever are disseminated by the louse. Mosquitoes, by biting, spread malaria, yellow fever, dengue and filariasis; the flea transmits bubonic plague; the bed bug, plague and possibly leprosy and other diseases; the tsetse fly, sleeping sickness; the sand-fly, three-day fever; and the tick, relapsing fever.

Articles of clothing, books and other objects which have been in contact with an infected person may carry the infection, and are referred to as fomites.

Not only may a person actually suffering from a disease be a source of danger to others, but also some who have recovered but still retain a focus of infection in the body. Such a person is called a carrier.

A person suffering from an infectious disease should be isolated until all danger of communicating the infection has passed.

It may be possible to isolate a patient at home, but if there is any difficulty in doing so, and especially when the disease is one of the more serious infections, the patient should be sent to an isolation hospital.

Room Chosen for the Patient

The room chosen should be at the top of the house, and should have a fireplace. A sheet wrung out of lysol solution, a teaspoonful to the pint of water, or some other antiseptic, and hung over the door, has the advantage of emphasising the fact of the isolation if it does nothing more. Carpets, heavy hangings, and all unnecessary furniture should be removed before the patient goes into the room. Feeding and other utensils used by the patient must be kept for his separate use.

Some person must be told off to attend to him, and should wear an overall when outside the room. Books should not be allowed to leave the sick-room. When the period of infectivity is over, the patient must be properly washed all over and dressed in fresh clothing, and the room and all its contents must be dealt with as described under the heading Disinfection.

Not only must the patient be isolated, but also anyone who has been in contact with him, the duration of this quarantine being regulated by the incubation period of the disease, and estimated from the last date of exposure to infection.

Some infectious diseases must be notified to the Medical Officer of Health for the district, and this should be done immediately the diagnosis is made. A list of such diseases is given under the heading Notification. Responsibility for notifying falls both on the doctor in attendance and on the head of the house or any other person in a similar position, but in practice the notification of a doctor usually suffices. The fine for failure to notify is 40s. The Act applies to boats, tents, vans or sheds used for human habitation, as well as to houses and other buildings. *See* Disinfec-tion; Fever; Fly; Quarantine; Rash.

INFIRM PERSONS: Care of. Elderly people left by themselves, either through gradual mental decay or neglect, often get into a dirty and sometimes verminous condition. Particularly is this so where they have only one or two rooms in a house; they then become a nuisance or danger to themselves and the other inmates of the house by their insanitary ways. The position is a very difficult one, and calls for tact on the part of the landlord or chief tenant of the house. In such circumstances the first step is to communicate with the relatives, if any can be traced, and get them to act and make provision for someone to look after the person and to keep them and the room and contents reasonably clean.

If such friends or relatives cannot be found the next step is to communicate with the relieving officer of the local Public Assistance Committee. He will interview the persons and try and persuade them to go into the local infirmary or hospital and be taken care of properly. It frequently happens that they will not consent, but prefer to continue in the old ways and keep their independence and muddle along, to the detriment of themselves and the other inmates of the house.

In such a case the only remedy is to notify the local sanitary inspector, who will make inquiries and refer the same to the medical officer of health. London and some of the larger cities and towns have acquired powers to deal with this problem. After examination of the person, the medical officer of health gives a certificate in writing that he or she is aged, infirm, or physically incapacitated, and resides in premises which are insanitary owing to any neglect on the part of the occupier, or is living under insanitary conditions, or is suffering from any grave chronic disease and is unable to get proper care and attention. Then the medical officer of health makes an application at the police court and gives evidence to the magistrate as to the danger to health and fire to the person and other inmates of the house.

Most of the Acts make the period of detention and maintenance in the hospital or infirmary under the magistrate's order at three months. Application must be made to the court for an extension of this period; ample provision is made to protect the liberty of the person, and every means is taken to get into touch with relatives and friends of the aged person, for it has to be remembered that the person becomes a charge upon the rates.

Before application is made to the court for the removal of the person, three clear days' notice must be given by the medical officer of health of his intention to apply to the court for this removal, and should any relatives be found who will come forward and take care of the infirm person, then, even after the order has been made, the court has power to make a rescission order and allow the person to be taken under the care of relatives and friends. *See* Old Age; Old Age Pensions.

INFLAMMATION. When any part of the body is irritated by an injury or the presence of bacteria, there is an increased flow of blood to it, producing the four characteristic symptoms of heat, redness, swelling and pain. Diseases whose names have the termination "itis" are inflammatory diseases, e.g. appendicitis, bronchitis.

In the treatment of inflammation the first thing to do is to remove the cause, if possible; for example, removing a foreign body from the eye. The part should then be put at rest. Pain may be relieved by lessening the amount of blood in the part; by keeping the part raised up, e.g. a whitlow in a finger; by applying cold applications which contract the blood vessels or by using heat to dilate blood vessels at some distance from the site of inflammation, and so draw blood away from this point, as when a poultice is applied to the chest wall to relieve congestion in the lung.

INFLATION. In the economic life of motor tires, and also pedal cycle tires, inflation, which is distending or filling with air, is an important factor. Tires must be kept inflated to the correct pressure as stated by the makers if freedom from trouble, e.g. chafing at the beads, is to be avoided. *See* Tire.

INFLUENZA. Due to a germ, there is good evidence for believing that the influenza bacillus of Pfeiffer is the one primarily responsible for this disease, although other germs have been found in association with the disease, and may be responsible for at least some of the complications.

The onset of influenza is sudden, and occurs from one to four days after exposure to infection. Running at the eyes and nose may suggest a bad cold, but usually the fever is higher, there is considerable headache and pain in the back and limbs, and more prostration. Often the throat is sore, and there is a dry, irritating cough. The tongue is furred, and there may be nausea and perhaps vomiting. The brunt of the disease may indeed fall on the digestive organs, and the symptoms be so sudden and severe as to suggest food poisoning. In some instances, it may be added, the onset of the disease is unusual as, without feeling noticeably unwell, a person has dropped unconscious in the street.

Ordinarily, after having persisted from three to five days, the temperature drops, suddenly as a rule. Some complication, however, may supervene. Bronchitis may become severe, developing into broncho-pneumonia. Sometimes the lobar type of pneumonia develops pleurisy, heart disease or Bright's disease. Apart from legacies left by some of its complications, even an apparently simple attack of influenza may have troublesome sequelae, such as considerable mental depression or neuralgia.

The chance of recovering from an attack of influenza is, generally speaking, good except where young children or aged or debilitated persons are concerned. The general treatment is that of the state of fever, but special emphasis must be laid on the necessity for rest in bed, abundance of fresh air, and of sufficient time for convalescence. Aspirin in 10-grain doses is useful for relieving muscular pains and headache. This or salicin, sodium salicylate or quinine may be given at intervals in order to combat the toxaemia of the disease. The patient ceases to be infectious in three or four days after the temperature has become normal.

The infection of influenza is mainly spread by the breath of an infected person, and the danger is increased by his sneezing and coughing.

During an epidemic an infected person should be given as wide a berth as possible. It is a prudent thing to walk to business, for example, or go on the top of a bus rather than in a closed vehicle, and rooms and offices should be especially well ventilated.

It may help to lessen the risk to gargle the throat and spray the nose with a weak solution of permanganate of potash twice daily. Should suspicious symptoms make their appearance, 15 drops of essence of cinnamon or of spirit of camphor taken on a lump of sugar may cut them short. Mixed vaccines, containing the influenza bacillus and other germs associated with the disease, are of definite value. *See* Cold; Cough; Fever.

INGLE NOOKS AND THEIR CONSTRUCTION

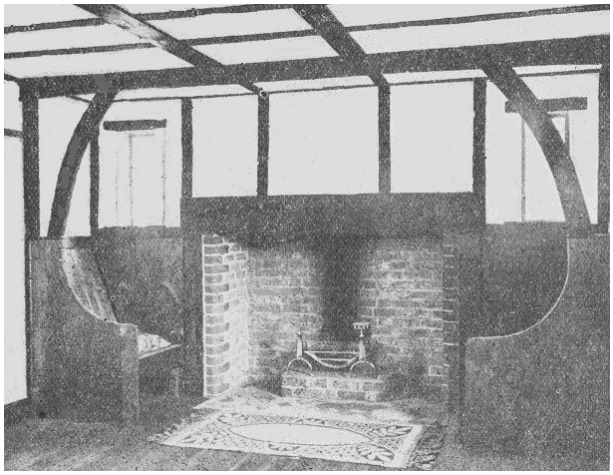
An Old-World Feature Adapted to the Modern House

This article, aided by further information under such headings as Corner Seat; Cottage; Joint; Stain; Wood, tells how an amateur can make an ingle nook for his house. See further the entries Chimney Piece; Fireplace; Settle.

The ingle nook may be described as a large opening fitted with a seat or with two seats, one on either side of a fire and within the chimney breast of the fireplace. Such are only possible in the large fireplaces of Tudor and Stuart times, or in those built in imitation thereof.

In some ingle nooks the seats are built into the walls, but if they are not, the nook can be completed by placing a wooden seat on one or both sides of the fire, care being taken that the distance between it and the fire is sufficient to leave the sitter in comfort. Obviously the seat must not be trimmed in any way.

The construction of an ingle nook will have to be determined; as regards its size and detail, according to the geography of the room in which it is to be constructed, and the purpose for which that room is required. As the ingle nook is a characteristic of the old style house, the construction should be on solid lines, and treated in such a manner that it will retain these characteristics. Generally this is accomplished by the use of rough-hewn oak posts and simple, direct methods of construction. As a typical example, the illustrations, Figs. 1 to 4, show how an ingle was formed in the dining room of a modern house, and suggest a method of construction which may be adopted elsewhere.



Ingle Nook. Fig. 1. This is built in the dining room of a modern house. The fireplace, a wide brick recess containing a basket grate, is flanked by comfortable settles, with sloping backs and seats.

The Work Described. In the case illustrated the fireplace was a brick recess, spanned by a heavy oak beam and accommodating a wrought iron basket fire mounted on a base of brickwork; but where that arrangement cannot be followed it is, for example, often possible to remove a cast iron register stove and to face up the opening with narrow facing bricks, splaying the jambs and building in a barless fire at the back.

A false oak beam could be fitted across the opening and should be faced with a fireproof material, as, owing to the small space between the fire and the canopy of the chimney, it would not be practicable or safe in the general run of cases to fit an actual wooden beam.

Having arranged the fireplace in the manner described, so that it is in character with the general scheme, the construction of the ingle can proceed, and in general it will be found that this will necessitate the fitting of false beams to the ceiling, unless such a feature is already present, as if there is to be any appearance ot realism the design should be based on what would have been in the old days the structural necessities of the case.

In the first case, the seats are simply built up in their place from ordinary building deal, this being easily accomplished by covering the end wall with 3-ply, nailed to rough grounds affixed to the brickwork, or, if the walls are smooth enough, direct to the plaster surface. Alternatively, a plaster wall could be covered with one of the high-grade, oak-grained wallpapers. The legs and a simple framework are then constructed, as shown on the detailed drawing, Fig. 2. Figs. 3 and 4 show the seat in course of construction and completed, the general method being to make up a frame with legs complete and to stand it in its correct position in the corner of the room.

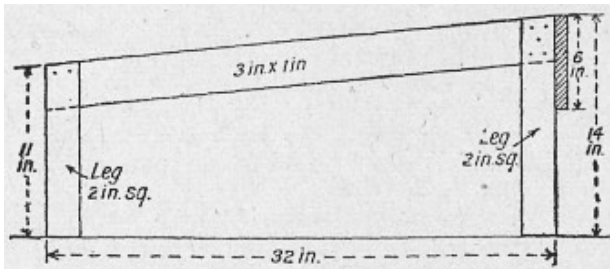
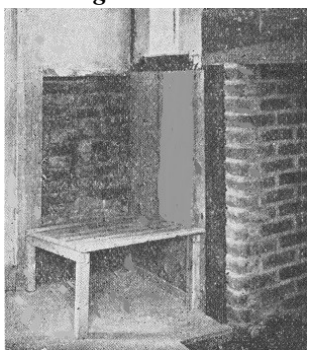


Fig. 2. Details of legs and framework of the settles shown in the ingle nook illustrated in Fig. 1.



Ingle Nook. Fig. 3. This shows the framing in place, with plywood facing in position on wall.

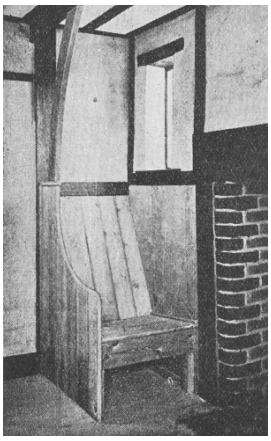
Making the Seats. For comfort's sake the seat should slope backward, being considerably higher at the front than the back, and if the rest, or back, be similarly sloped and rightly adjusted, a really comfortable seat is the result. On no account should the seat and the back be at right angles, for the seats will not then be comfortable.

The next step is to prepare 1 in. tongued and grooved floorboards and nail them on the top of the framework, thus forming the seat. Oval brads should be used for this work, and their heads punched well

below the surface. The front of the seat, or that part of it which faces the length of the room, is prepared from similar boards sawn to the desired shape, lengths of floorboard being cut as nearly as possible to match the curved shape, which may afterwards be worked up by sawing it with a pad saw and finished when in place both with a spokeshave and sandpaper.

These pieces should not be glued together, but should be simply secured by 2 in. oval brads to the face of the framework, or preferably by screws passing through the framework into the side pieces. A dummy upright post, comprising a rough hewn oak plank attached to the wall, may either be grooved to receive the side members, or these may be secured in position by beads on each side; the latter is the simplest way for the amateur.

The next step is to cut a sufficient number of pieces of ¾ in. matchboard to the length requisite to form the back, and to bevel the upper and lower edges so that they are a good fit on to the top of the seat and on the rough ground attached to the wall, respectively. A single crossbar is fixed between the front part and the wall, and also two rough pieces inclined at an angle and attached respectively to the wall and the side piece of the seats, to form a foundation to which the back can be nailed. A capping is then fitted to the top of the front piece and a simple moulding run around the wall on this line, across the back of the seat, along the sides and terminating at the great beam over the fireplace.



Ingle Nook. Fig. 4. The seat complete and ready for staining.

To cover the nail heads and make a neat finish around the seat, sides, and back, a simple ¼ round moulding is glued or pinned in the corners. The whole of the woodwork is stained dark oak colour.

Dummy Timbering. If it is desired to fit dummy timbering, a heavy plank about 6 in. wide and about 2 in. or so thick should be rough hewn to represent a beam spanning the two uprights of the back and sides. This is further supported by two roughly shaped and curved members, rising from the capping on the top of the sides and terminating about a quarter the length of the beam from the walls. The false timbering on the ceiling is easily arranged with rough hewn strips of oak, or even plain deal stained to a dark brown colour, and secured to the rafters by oval brads, driving these right through the plaster into the rafters or floor joists.

When two small windows are in existence, or can be provided, one on each side of the fireplace, they add a great charm to the ingle and have a real value in providing light for the seats. They make reading or sewing a practical proposition, as usually the corner by the fire has a tendency to be dark. The ingle can be further decorated by a few judiciously applied strips of rough hewn oak attached to the wall to represent old timbering.

INHALATION. The method of inhalation is used for many drugs, mostly in the treatment of respiratory disorders. Creosote, eucalyptus oil, compound tincture of benzoin (Friar's balsam), menthol, camphor, etc., may be administered in respirators, inhalers, volatilized in steaming water or on respirators, while some drugs to relieve asthma are smoked.

The simplest method of giving medicated steam inhalations is to fill a large jug with a pint of boiling water, 2 parts, cold water, 1 part, add a proper quantity of the drug, cover the head with a towel, and place the face over the jug. One teaspoonful of Friar's balsam used in this way will sometimes cut short a cold, if no time is lost after the first symptoms appear.

INITIAL: How to Work. The usual custom of initial embroidery is to choose the first letter of the surname, but this is often varied; as occasion demands, by working instead the first letter of the Christian name, or for a more elaborate device, taking both the first letter of Christian and surname, and grouping them together attractively.

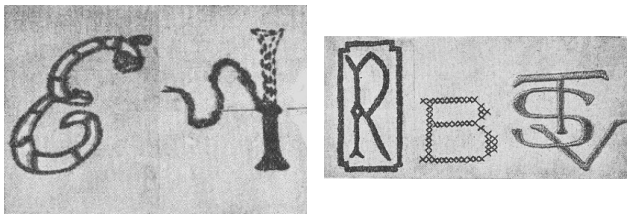
The Stitches Used. When working initials it is important to prepare the ground by padding the outline, in order to give a raised effect that is particularly attractive. The simplest method of doing this is to cover the inside part of the outline with rows of running stitches, all of an even length, and fairly close together as shown. It is possible to buy at most fancywork shops some attractive initials made in papier mache that will form a padding, and only require to be placed on the material and closely covered with satin-stitch to secure them in place; but these are not to be recommended for garments that are to go to the wash.

Another method which is very good for fine work on such things as linen handkerchiefs or underwear is to employ a thick thread or fine cord, and lightly sew this to the outline of the initial before covering it with a close oversewing stitch. Satin-stitch should always be worked across the shorter way of the shape to be embroidered. It consists of perfectly straight and even stitches, that should be made to lie quite closely together.

A more elaborate result may be obtained by working the initial in Venetian ladder work, and in this case the padding is unnecessary, as the centre of the shape is cut away. The whole outline is first closely covered with a fine running stitch, and the ladders that connect it from side to side are worked in buttonhole- stitch. With very fine scissors cut through the centre of the shape and turn back the edges to the line of the running stitches. Now closely work round the outline in fine over-sewing or in buttonhole-stitch as desired. Carefully cut away the raw edges of the material when

the embroidery is finished.

Another device for embroidering large initials is to cut out the outline in a contrasting material, and appliqué it to the article. Blanket-stitch is a good medium to use for securing it in place, and it is advisable to choose a material for the lettering which is not easily inclined to fray. Another plan is to embroider the initials in satin-stitch on a fine piece of net, and then to insert the net, shaped into some fancy device such as a circle, square, or oblong.



Initial. Designs for four single letters and a monogram, showing also methods of embroidering them in Venetian ladder work, padded satin-stitch and cross-stitch, the latter being suitable for the coarser kind of house linen.

Easy to make and very suitable for towels is the initial worked in cross-stitch as shown in diagram. The stitch is made by taking up equal strands with the needle in a slanting direction, and at right angles to each other, each pair of cotton strands forming a single cross-stitch. It is advisable to work this embroidery on very coarse threaded material, as this helps considerably when the threads have to be counted in order to keep the stitches regular. The simplest way to obtain an outline for the initial is to sketch one on finely squared paper, and then count the squares that are thereby covered, making each square represent a stitch. It will be quite easy to follow this guide on the actual linen. *See* Cross Stitch; Embroidery.

INK: Its Varieties. Ordinary black writing ink is made by mixing ferrous sulphate with Turkey or Aleppo galls, which contain gallo-tannic acid, and adding a little gum arabic. There are many recipes, the proportions varying in each, but the best results are said to have been obtained with one part of the sulphate to about 3 parts of the galls. A good black ink may be made by boiling 8 oz. of galls in a gallon of water and adding 6 oz. each of ferrous sulphate and gum, or 6 oz. of galls and 4 oz. each of the sulphate and gum in 6 pints of water.

A special ink is required for the zinc labels used by gardeners. This is made by mixing ½ oz. of lamp-black with 1 oz. each of verdigris and sal-ammoniac in ½ pint of water. The zinc should be thoroughly cleaned before the ink is applied.

Marking Ink. Marking ink is mainly metallic in composition and is usually prepared with aniline salts, which produce a deposit on the surface of the article marked. It is generally used for marking names or initials on linen, cotton and clothing. The deposit may be obtained by passing a hot iron over the writing, but in some varieties it is possible to dispense with this process.

Other Special Inks. Special inks are made for other purposes, copying and drawing among them. Any ordinary iron gall ink will yield a copy for some time after writing, but in order to get better results a larger proportion of ferrous sulphate, galls and dye should be used. With this should be mixed a small amount of a substance such as glycerin, to prevent the ink from drying too rapidly.

Drawing inks include sepia, Indian ink, and the so-called waterproof ink. Indian ink is composed mainly of fine lamp-black and glue. Waterproof ink consists of a pigment or colouring matter suspended in a liquid medium, e.g. a solution of shellac. Typewriting inks frequently consist of a solution of methyl violet with a thickening agent, such as glycerin or oil. For writing on bottles a suitable ink can be made by dissolving 60 parts of borax by weight in 250 parts of water. Warm the borax and add the water to it, stirring all the time. For colouring, one part of methyl violet can be added.

INKSTAND. The inkstands sought by collectors are chiefly articles of silver or Sheffield plate dating from the eighteenth century. They appear to have been first made in England about 1700, and the styles are many, ranging from the boat-shaped one with its pair of silver-mounted bottles to massive silver pieces that are heavily moulded. A popular style is the box-shaped one, which has corners of heavily stamped metal, and in some silver pieces four cast feet. One beautiful silver example, dating from 1770, stands on four claw and ball feet. The tray has a gadroon border, and there are three pierced cages for the three bottles, which are of crystal with silver mounts. Many of these old inkstands are provided with a sandbox, a waferbox, penwiper, and a taperholder in addition to the bottles.

Inkstands are included sometimes in modern writing desk sets of lacquered or painted wood. Opaque glass in a brilliant colour is effective for inkpots, pen tray, ash tray and candlesticks. Other charming inkstands are of flowered china mounted in ormolu with holes at each side of the inkwell to accommodate quill pens in harmonizing colours.

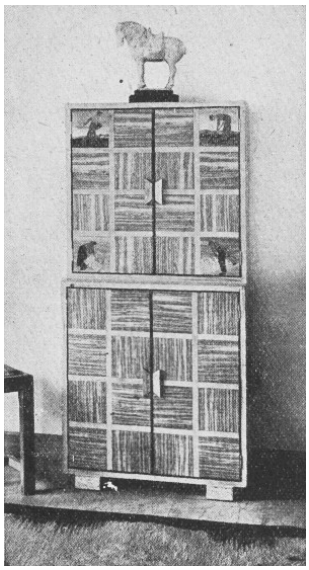
INLAYING: THE ART EXPLAINED

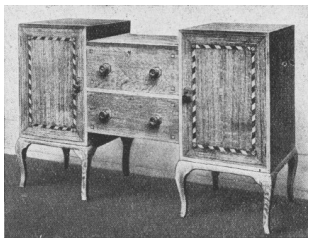
A Pleasing Decoration for Pieces of Furniture

Those interested in this subject should consult the articles on other forms of wood decoration, e.g. Fretwork; Graining; Marquetry; those on the various pieces that are inlaid, e.g. Cabinet; Sideboard; and those on the woods used, e.g. Ebony; Satinwood. See also Antique Furniture; Furniture; Hepplewhite; Jacobean Style; Sheraton.

The art of inlaying consists in cutting away or recessing a given ground work to receive a substance cut to a corresponding shape, the inlaid portion being of either different material or different colour, so that

it will thus show in relief against the ground work. Its use, for the main part, is a decorative one, though it can be employed to advantage in a theoretically constructive sense.

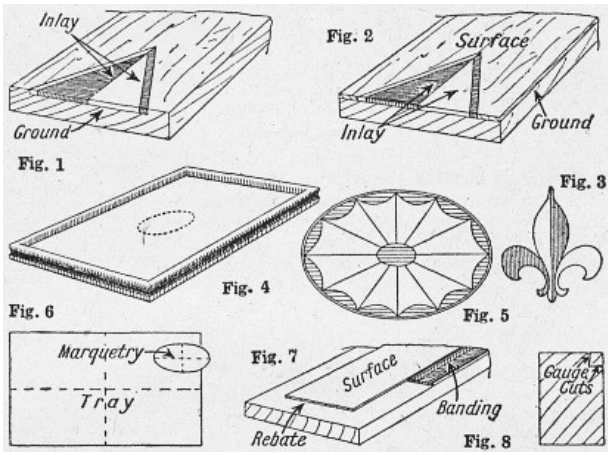




Inlaying. Examples of modern pieces. Left cabinet in figured oak with inlaid lines and applied marquetry panels. Above, oak sideboard inlaid with fancy banding in ebony and satinwoad. (Rowley Gallery, Kensington)

The more advanced work naturally requires a good deal of skill in its execution, and can hardly be recommended to the amateur as a branch of work within his range but among the more simple types of inlaying there is a great deal of scope, and there is no reason whatever why he should not make his work more interesting by decorating it with a simple form of inlay. The methods employed in inlaying may be roughly divided under two headings, that of inlaying a given ground and that of applying a surface piece, already inlaid, to a ground work. This latter is in many respects similar to the method employed in marquetry work, but differs in that marquetry is made from veneers and requires a special cutting arrangement, known as a donkey, and is cut at a right angle to the work; whereas in the method to be explained here a surface measuring anything from 1/16 in. to ¼ in. thick is required and is cut at a different angle. Figs 1 and 2 show the two methods employed to give the same effect, Fig. 1 being inlaid directly in the ground, and the other formed on an applied surface. The former is the inlay proper, and is often the only method which can be practicably employed.

Simple Inlaying. Fig. 3 represents an inlaid pattern of holly and ebony for an oak ground. The design should be first carefully drawn full size on a piece of paper and an indication made of which portions are to be in holly and which in ebony. The shape of each inlaid portion is then marked out on the corresponding pieces of wood for inlaying (these being about ⅛ in. thick) by means of carbon paper, and carefully cut out with a fine fretsaw; all the pieces are assembled on the drawing and fitted together, care being taken to get close joints. Any straight joints may be trued up with a plane, while for the shaped parts a spokeshave or rasp will be useful. They are then all glued to the drawing and together, and another piece of paper glued to the other side, the whole then being laid between two flat boards and cramped and allowed to set. When dry the drawing is stripped off the back and any surplus glue cleaned from off the edges, and the inlay placed in position on the ground work and scribed round the edges with a pointed tool.



Inlaying. Fig. 1. Direct inlay. Fig. 2. Surface inlay. Fig. 3. Inlaid pattern in holly and ebony. Fig. 4. Mahogany tray ready for central inlay. Fig. 5. Sheraton ornament for tray. Fig. 6. Method of marking position for inlay. Fig. 7. Edge removed for a wide banding. Fig. 8. Use of cutting gauge for inlaying lines at edge.

The ground is now cut away to a depth slightly less than the thickness of the inlay, to allow for cleaning off. This is done with chisels and gouges and must be as clean as possible, the bottom of the recess being perfectly flat and equidistant from the surface all over. In the larger portions this is better accomplished with a router.

The inlay must now be made perfectly flat on the underside; the best way to do this is with a toothing plane, which not only levels the work, but makes a series of fine scratches which enable the glue to hold better. It may then be glued in and cramped and left to set for as long as possible, and then cleaned off. If insufficient time is allowed in the setting, it will be found that the inlay will sink.

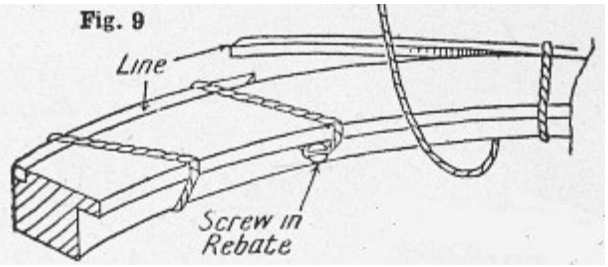
The same method is followed when it is desired to inlay a piece of marquetry in a solid ground, such, for example, as Fig. 4, which shows a mahogany tray the centre of which it is desired to inlay with a Sheraton ornament, as Fig. 5. These can be bought cut in the form of marquetry.

To begin, the two axes are marked on the oval, and the corresponding centre lines on the tray. These will give the exact position for the oval (Fig. 6). It is then proceeded with as before. It will be found that the marquetry has a piece of paper glued on one side; this must face upward so that the glue will grip the plain wooden side. Glue the inlay in position and heat a flat block of wood large enough to cover the inlay, and cramp this down on to the inlay with a piece of paper between to prevent the block from sticking to the work. The heat of the block will thus re-liquefy the glue and allow the inlay to be pressed right down.

Bandings and Lines. Bandings may be made by the worker, but they can be bought quite cheaply. They are made in great variety, some being shown in. Fig. 15. For the inlaying of these a special tool is required known as a scratch. This is easily made by the worker and is of the form given in Fig. 16. It consists of a block of wood shaped as shown, cut in two and then screwed together again, so that the two pieces may be loosened at will. A piece of steel for the cutter is then filed to the width of the inlay to be used (a piece of an old saw blade will do) and inserted between the two parts of the scratch at the required distance from the shoulder, and the screws tightened. To use it the shoulder is kept tightly up against the edge of the work and worked up and down (Fig. 17). When working across the grain it will be found advisable to cut in the two sides of the groove with a cutting gauge or chisel to prevent the wood from splitting up.

For wide bandings to be put round the edge it will be found better to cut round with a cutting gauge and then remove the surplus, as in Fig. 7, with a bull-nose or shoulder plane; while for a line to be put at the edge, a gauge may be used on both edges (Fig. 8). The bandings are glued in and pressed well down with the back of a hammer (Fig. 18). In a rectangular shape the corners are mitred. When two lines cross, put the narrow one in first, and scratch the other across it when dry. To put a line round a circular or oval ground such as a mirror frame, the edge is gauged round to form the rebate for the line, as is shown in Fig. 8.

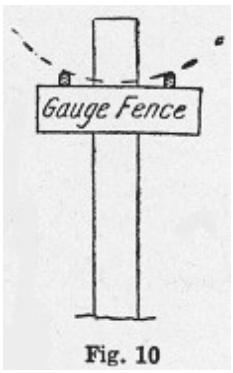
When glueing, put a screw in the inside of the frame and tie a piece of fine string to it and then put in the line, glueing a little way at a time and binding the string round as you proceed until the starting point is reached, when the line is cut off, as in Fig 9. The joint in an oval should occur in the flattest part of the shape so that the line will not be so apt to spring out. The string, having been damped, will pull the line in tighter. It is then cleaned off in the usual way.



Inlaying. Fig. 9. Method of binding in glued lines.

When inlaying a line a little distance from a circular edge, a good plan is to use a gauge having two projections fastened to the fence, as in Fig. 10, to keep the gauge held rigidly in the correct position.

When a line or banding has to be inlaid in such a position that it is not possible to use a gauge or scratch from a parallel edge, as in Fig. 11, a straight-edge should be held down in a line with the required inlay, and the groove scratched out with a narrow chisel or bradawl the same width as the inlay, while for shaped inlays a template of the shape is cut, and this used as a fence against which the tool may be worked, or in the event of the shape being a circular curve it is sometimes better to file one of the leg points of a pair of dividers for a cutter to the width of the groove and use these, the other leg acting as centre. This is only practicable when the shape is a quick one. It is sometimes necessary when glueing the line to steam it to render it sufficiently pliable to bend round a quick shape. In all cases of lines or bandings use the glue as hot as possible, work in a hot room and proceed with it quickly.



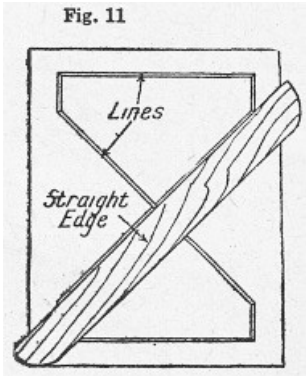
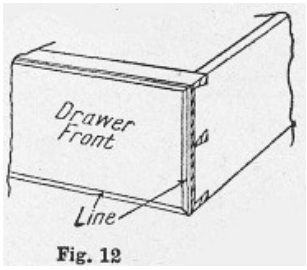


Fig. 10. Gauge for use with a circular edge. Fig. 11. Method of using straight edge for diagonal line inlays.

An example of inlay not used for a purely decorative purpose is in the case of a veneered surface, when an inlaid line is put across the grain at the end to prevent the veneer from being chipped off, as in Fig. 12; drawer fronts are often treated in this way, being liable to catch.

Fig. 12. Drawer front with inlay to prevent veneer from chipping.



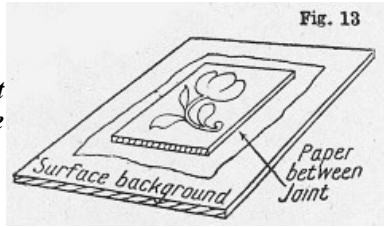


Fig. 13. Marking out pattern for surface inlay.

Applying an Inlaid Surface. The other method of in-laying, i.e. that of applying the inlaid surface, is done as follows. After making the drawing on paper, the ground is prepared, planed perfectly true, and toothed. Now take the surface background and mark roughly the limits of the inlay, i.e. the extent of ground it will cover.

Next prepare the wood for the inlay the same thickness as the background, and with thin glue and with paper in between apply it to the background in a position to cover all the inlay. When dry, mark out the

design from the drawing with carbon paper (Fig 13 shows the two pieces marked out), and with a fine saw cut round the design, holding the saw tilted at a slight angle so as always to undercut the inlay, as in Fig 14. The tilt of the saw must be always in the direction of the inlay, so that when this is put in position a close joint will show. Having cut the pattern, the two thicknesses are separated, the paper removed from the underside of the inlay and the two portions tried together. They are then glued down on to the ground, cramped between two flat boards and allowed to set, and, when dry, cleaned up in the usual way.

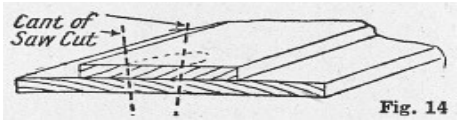
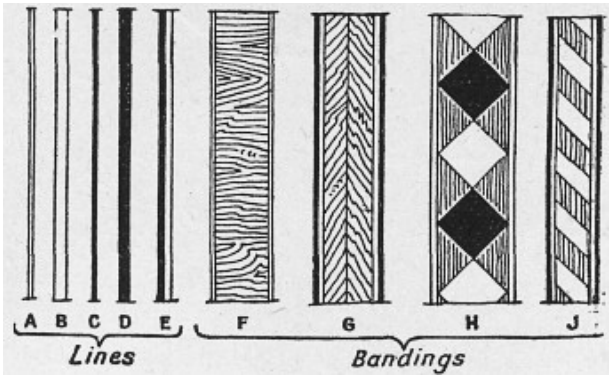
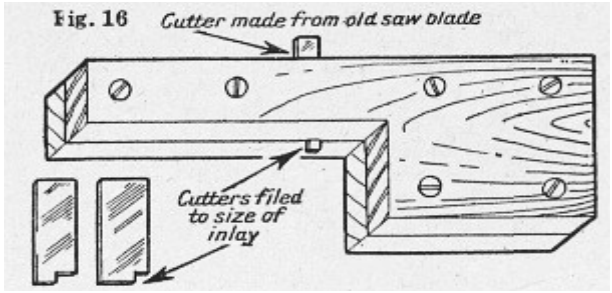


Fig. 14. Showing angle of saw cut in making a surface inlay.



Inlaying. Fig. 15. Lines and bandings employed.



Inlaying. Fig. 16. Home-made scratch for making groove; the steel cutter is filed to the width of the inlay to be used.

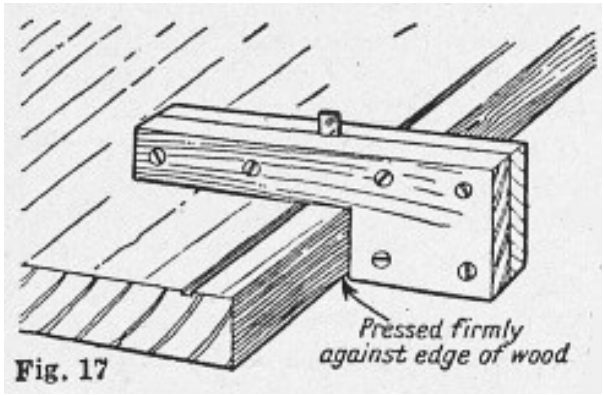


Fig. 17. Making the groove in which the inlay fits.

Fig. 15 shows some lines and bandings used in inlaying. A and B are lines usually made of either box or satinwood; C and D, of ebony or of a cheaper wood stained black to represent ebony. E is a combination of the two. F, G, H, and J are bandings made in various fancy woods, such as kingwood, rosewood, tulip wood, etc. The lines at the edges are not only decorative but strengthen the inlay, binding the whole together.

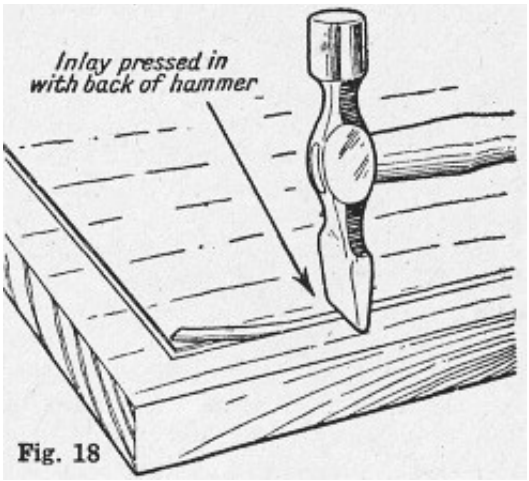


Fig. 18. Glueing in the inlay by pressing with the back of a hammer.

INOCULATION. The act of introducing a disease germ into the body through a breach of the skin or the mucous membrane is called inoculation. The microbe of tetanus may be inoculated; for example, through treading on a dirty nail or through a cut. Vaccination against smallpox is an instance of preventive inoculation, the virus of cow-pox being introduced through the scarification of the skin so that by passing through the milder disease a person may be protected against the more serious. Inoculation is performed by scarifying the skin and rubbing with virus, or, alternatively, by the use of a syringe. *See* Diphtheria; Vaccination.

INQUEST. In England an inquest or inquiry by a coroner, with or without a jury, may be held into the death of any person whose dead body is in the district, but no inquest is held as a rule if a medical man gives a certificate stating the cause of death. It is therefore employed in the case of death from violence and also in the case of sudden death when no doctor has been in attendance, and is intended to find out whether or not there has been anything like foul play. Instead of holding an inquest the coroner may now order a post-mortem examination to be made, and if he is satisfied with the report no inquest is necessary. In Scotland the above duties are discharged by the official known as the procurator-fiscal.

Before 1927 it was necessary for a coroner to have a jury to assist him in his inquiry. This is no longer obligatory, unless there is reason to suppose that the death is caused by murder, manslaughter or infanticide, or by a street accident, or that it took place in prison. The jury must number at least 7, but not

more than 11. *See* Death; Funeral.

INSANITY. The term insanity covers a great variety of mental disorders which differ in their causation, treatment and outlook for improvement or recovery. The following are the principal forms: manic-depressive insanity, which includes mania and melancholia; acute confusional insanity, a disorder that may follow exhaustion resulting from influenza and other diseases, surgical operations, child-birth, severe anaemia, and excessive mental or physical fatigue; paranoia, in which the patient suffers from systematized delusions; dementia, a general loss of mental capacity; general paralysis of the insane, the primary cause of which is syphilis; and epileptic insanity.

Heredity plays an important part in the causation of all forms of insanity, and other factors are infection with syphilis and addiction to alcohol. A large amount of mental disease is preventable. That due to heredity, however, could only be prevented by suitable marriage. Any person with a neuropathic inheritance should be a total abstainer. Public health measures, by diminishing disease generally, and educational and economic measures which raise the standard of comfort of the poorer classes and lessen the stress of their struggle for existence, will be beneficial.

Some insane persons can safely be kept at home, but when restraint and skilled nursing are needed the expense and worry involved usually makes institutional treatment necessary. This has the further advantage, however, that the routine of an institution generally has a tranquillising effect on a disordered mind. The legal procedure involved in putting an insane person under restraint in an asylum is dealt with under the heading Lunatic. *See* Delusion; Feebleminded; Hysteria; Neurasthenia.

INSECT: In the Garden. The policy of the average gardener is to make an end of all insects he sees, prompted by his belief that they are his enemies. Such an attitude is to be explained only on the ground of ignorance. But no real gardener is justified in remaining ignorant of the forces that help or hinder him in his chosen work.

All the butterflies and moths pass through a caterpillar stage, and with few exceptions all caterpillars are plant-eaters. But all the butterflies and moths do not leave behind a batch of eggs from which the all-devouring caterpillars will issue. Out of more than 60 butterflies on the British list, only the large white and the small white are pests.

With the moths it is different; though some may have come from neighbouring woods and hedges, many of them may have developed in the garden at the expense of the plants.

All caterpillars found upon plants are there for purposes of plunder. The forward-tapering, somewhat flattened larva of the hover-fly may be mistaken for a kind of caterpillar, but the observation that should precede drastic action would show that it feeds exclusively on plant-lice (aphis) and is to be encouraged. The grubs of the numerous species of sawfly are very like caterpillars; but any mistake in this direction does not matter, for these are all enemies. The larvae of the lady-bird beetles are often mistaken for plant-feeders of some sort, but the error is a disastrous one. They are sluggish creatures of slaty hue spotted with red, blue and black. Their sole food consists of plant-lice.

Any other beetles that may be seen upon foliage should be regarded with suspicion. They gnaw shot-holes in the leaf, not eating them from the edge as most caterpillars do. The large cockchafer and the smaller summer chafer are great delinquents in this matter, continuing the injuries they have inflicted during their long life as grubs underground. The beetles that live in the ground during all their stages may be regarded as valuable allies, for they prey upon foes the gardener may never see.

Dragon-flies, including the large falsely called horse-stingers, are to be welcomed, for their food consists of other insects. The legion of two-winged flies (diptera) are a very mixed lot and require nice discrimination. On the one hand they include the pernicious onion-fly, celery-fly, lettuce-fly, and crane-fly, or daddy longlegs; on the other hand, the helpful hover-flies, already mentioned, and a number of species whose grubs are internal feeders in caterpillars.

Beneficial Insects. The insects with four transparent wings (hymenoptera), including bees, wasps and ichneumon-wasps, are, with the exception of the sawflies, beneficial. Bees of all sorts, when they visit flowers for nectar and pollen, are also assisting in the production of fertile seeds by the transfer of some of the pollen; and wasps, though they attack overripe and damaged fruit in autumn, are engaged all the summer in destroying noxious insects for the nourishment of their helpless grubs. Over 1,200 British species of ichneumon-wasps carry out similar useful functions, though in a different way, laying their eggs in or on caterpillars and other insects that their grubs may flourish by consuming the internal substance of the gardener's foes.

Of opposite nature are the bugs (hemiptera) of all kinds, including plant-lice, froghoppers and scale-insects; being all sap-suckers, they are, as a tribe, noxious. Earwigs, though they damage certain flowers by gnawing the petals, also feed partially on insects.

The gardener who wishes to be sure as to the identity and the friendly or unfriendly nature of insects should keep in a pocket of his garden jacket two or three of the glass-bottomed boxes used by entomologists. In these he can imprison insects that are unknown to him, observe them closely and in detail, and arrive at a decision as to his attitude to that species. *See* Beetle; Moth, etc.

INSECTICIDE. Insecticides are fluids for destroying certain insect and other pests, and so protecting trees and plants. They may be divided into

two classes, one used against sucking and the other against biting insects.

Washes of the poison type act by poisoning the food of the insects, and are used for all the leaf-eating pests. Arsenate of lead in paste form is recommended, and the formula for making it is ¼ lb. of lead arsenate paste to 5 gallons of water. The wash should be applied in a fine spray, the aim being to wet all the leaves without drenching them, so that when they have dried they will be covered uniformly with poison. Contact insecticides, which are sprayed on to their objective, kill insects, not by poisoning their food, but by contact with their bodies. To attain this, the washes should be applied with as much force as possible with a coarse spray. A wash containing nicotine is advised.

The formula for nicotine soap wash is ⅜ oz. of nicotine to ¼ lb. of soap and 5 gal. of water. Both the water and the soap should be soft. If, however, the water is hard ½ lb. of soap should be used. Dissolve the soap in hot water, dilute it to the required strength, add the nicotine, and then stir it well. Hard soap can be used if soft cannot be obtained.

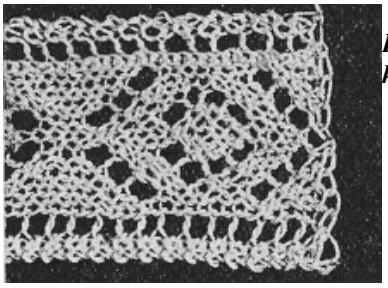
It should be noted that nicotine and lead arsenate are very deadly poisons. Lead arsenate should not be used where vegetables are grown underneath fruit trees, or on gooseberry bushes if the fruit is to be picked green. If nicotine is applied, a fortnight should be allowed to elapse before the vegetables or green fruit are gathered. Empty nicotine bottles must always be destroyed. *See* Apple; Currant Sawfly; Fruit; Gooseberry; Green Fly; Spraying; Syringe, etc.

INSERTION: In Needlework. An insertion is a strip of fancy stitching or lace used to join two pieces of material together, to add a false hem to a garment in an attractive way, or inset for pure decoration. Insertions are very charming when made at the hems of tablecloths, guest towels, pillow cases, lingerie, collars and cuffs and baby linen.

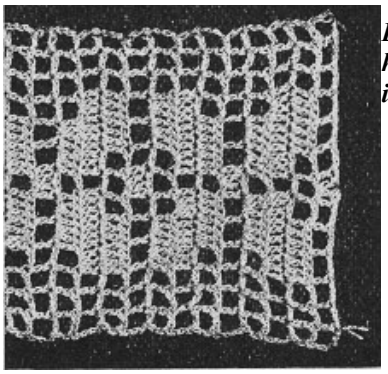
There are various lace stitches which can be successfully used for insertions. One of the most popular is twisted Russian stitch. This consists of diagonal stitches taken between the upper and lower hems, each stitch being twisted round the last one. Overcast or buttonholed bars can be used, ornamented with picots or left plain *(See* Embroidery), and if desired elaborate branched bars can be used if the insertion is to be fairly wide. For a broader insertion, make loose buttonhole stitches along each hem, and join the opposite rows of loops with twisted Russian stitch.

Lace Insertions. Charming lace and crochet insertions can be bought very inexpensively, ready to set into the material, or they can be made at home. Two examples, knitted and crocheted, are described and illustrated here.

Knitted Insertion. Using No. 20 ordinary crochet cotton, and No. 14 steel knitting needles, the knitted insertion works out about 1½ in. wide. With ordinary knitting silk and No. 7 bone needles it would be 3½ in. wide.



Insertion. Top, hand-knitted insertion.



Bottom, example of handmade crochet insertion.

Cast on 15 stitches. Purl one row. 1st row: Slip 1, knit 1, make 1 (by passing the thread to the front of the needle, so that it passes over the latter when knitting the next stitch, and in the next row this thread is knitted), knit 2 together, knit 1, knit 2 together, make 1, knit 1, make 1, slip 1, knit 1, pass slip-stitch over, knit 2, make 1, knit 2 together, knit 1.

2nd row: Slip 1, knit 2, purl 9, knit 3. Every alternate row is worked in exactly the same way. 3rd row: Slip 1, knit 1, make 1, knit 2 together, knit 2 together, make 1, knit 3, make 1, slip 1, knit 1, pass slip-stitch over, knit 1, make 1, knit 2 together, knit 1. 5th row: Slip 1, knit 1, make 1, knit 3 together, make 1, knit 5, make 1, slip 1, knit 1, pass slip-stitch over, make 1, knit 2 together, knit 1.

7th row: Slip 1, knit 1, make 1, knit 2 together, knit 1, knit 2 together, make 1, knit 1, make 1, slip 1, knit 1, pass slip-stitch over, knit 2, make 1, knit 2 together, knit 1. 9th row: Slip 1, knit 1, make 1, knit 2 together twice, make 1, knit 3, make 1, slip 1, knit 1, pass slip-stitch over, knit 1, make 1, knit 2 together, knit 1. 11th row: Slip 1, knit 1, make 1, knit 2 together, knit 1, make 1, slip 1, knit 1, pass slip-stitch over, knit 1, knit 2 together, make 1, knit 2, make 1, knit 2 together, knit 1. 13th row: Slip 1, knit 1, make 1, knit 2 together, knit 2, make 1, slip 1, knit 2 together, pass slip-stitch over, make 1, knit 3, make 1, knit 2 together, knit 1. 15th row: Slip 1, knit 1, make 1, knit 2 together, make 1, slip 1, knit 1, pass slip-stitch over, knit 3, knit 2 together, make 1, knit 1, make 1, knit 2 together, knit 1. 17th row: Slip 1, knit 1, make 1, knit 2 together, knit 1, make 1, slip 1, knit 1, pass slip-stitch over, knit 1, knit 2 together, make 1, knit 2, make 1, knit 2 together, knit 1.

19th row: Slip 1, knit 1, make 1, knit 2 together, knit 2, make 1, slip 1, knit 2 together, pass slip-stitch over,

make 1, knit 3, make 1, knit 2 together, knit 1. 21st row: Slip 1, knit 1, make 1, knit 2 together, knit 8, make 1, knit 2 together, knit 1. 23rd row: Like the 21st row. 24th row: Like the 2nd row.

Repeat from 1st row for length required for the work.

Crochet Insertion. The example illustrated was worked with No. 26 ordinary crochet cotton and a No. 5 steel hook, and measures nearly 2 in. wide. Begin by making 45 chain stitches for the foundation. 1st row: 1 treble into the ninth chain from the hook, * 2 chain, miss 2 chain, 1 treble in the next stitch, making a space; repeat from * four more times, then 1 treble in each of the next three stitches, 6 spaces, 5 chain. Turn.

2nd row: 3 spaces (putting the first treble on the second treble from the hook), 6 treble, 3 spaces, 6 treble, 3 spaces, 5 chain. Turn. Turn each row with 5 chain throughout the pattern, and this will form the first space of following row.

3rd row: 3 spaces, 9 treble, 1 space, 9 treble, 3 spaces. 4th row: 4 spaces, 6 treble, 1 space, 6 treble, 4 spaces. 5th row: 6 spaces, 3 treble, 6 spaces. 6th row: 4 spaces, 6 treble, 1 space, 6 treble, 4 spaces.

7th row: 3 spaces, 9 treble, 1 space, 9 treble, 3 spaces. 8th row: 3 spaces, 6 treble, 3 spaces, 6 treble, 3 spaces. 9th row: 6 spaces, 3 treble, 6 spaces. Repeat from the 2nd row for the length of insertion required.

Embroidery Stitch Insertion. The simplest form of insertion is a band of embroidery stitches. To prepare the edges of the material, turn under twice the raw edges of the pieces to be joined. Tack the two pieces of material, along the turnings, on to a piece of stout paper, leaving a space between as wide as the required insertion. Then join the two hems by a lace stitch. *See* Crochet; Knitting; Lace.

INSOMNIA. Sleeplessness may arise from any of the following minor causes: cold feet, bad ventilation of bedroom; uncomfortable bed, too heavy, too warm, or insufficient bed-clothing, a hot room; hunger, a full stomach, too high or too low a pillow, noise, too much light in the room, tea or coffee taken late in the evening; mental or physical overwork and exhaustion, want of exercise, worry, financial anxiety, domestic troubles; retiring at irregular hours, and from many other small errors which can be corrected.

Habitual insomnia may result from a preoccupation of the mind with the worries and chagrins of the daily life; but it may result also from repressed experiences, whether or not these assert themselves in dreams, arousing the patient to uneasy wakefulness. In these cases psycho-therapy may be of service.

In relief of the condition the following precautions should be observed:

See that the room is well ventilated. It should have a fireplace or an efficient ventilator. The window should be wide open, or the top sash lowered 8 to 12 in. The best temperature for a bedroom is about 60°.

Let the bedclothes be light, but sufficiently warm. For most people a pillow 3 in. high is satisfactory. It is often a good plan to raise the head of the bed about 2 in. by placing blocks of wood under the legs at that end. This tends to prevent any undue filling of the brain vessels with blood. Never go to bed with cold feet.

As a rule it is well not to eat a substantial meal later than three or four hours before bedtime. On the other hand, the want of food may banish sleep. In this case a glass of warm milk with a few biscuits should be taken at bedtime. Sometimes when one wakes up and cannot get off to sleep again, munching a biscuit proves effective. Strong tea or coffee taken late may prevent sleep.

It is best to cease both mental or physical work at least an hour before bedtime. A tepid bath just before getting into bed is another good remedy, or a hot foot-bath may be effective. A brisk walk is an excellent producer of sleep, even when one is already tired. Massage is one of the best remedies. Sometimes the change from a hard to a soft bed, or vice versa, will effect a cure. Go to bed at regular hours, and just before getting into bed sponge the face with tepid water, and then brush the hair for a few moments. Repeating poetry, counting numbers, picturing peaceful scenes, and many other such devices sometimes succeed in mild cases; and autosuggestion may be useful.

Drugs should only be used when other measures fail, especially in habitual insomnia, and then should never be used except when under the care of a doctor, or a drug habit is formed and difficult to break. *See* Sleep.

INSULATOR. This is a substance which offers an extremely high resistance to the passage of an electric current. Insulators are used to prevent the flow of electric currents between conductors, or between a conductor and earth. Such substances as glass, ebonite, bakelite, mica, glazed porcelain, vulcanite, etc., are good insulators.

Insulin. *See* Diabetes.

INSURANCE: LIFE, FIRE AND ACCIDENT
Protection for Property and Provision for Death

This article deals with the whole subject of Insurance as far as it affects the householder. Insurance against ill-health, the national scheme, is explained in the succeeding article. See Burglar Alarm; Fire; Fire Alarm; Motoring.

Insurance is a system whereby for a consideration, usually the premium, an insured person has made good for him, up to the limit of his insurance, loss or damage befalling him through an event insured against. Insurances are usually carried by companies, but sometimes by individual underwriters, and occasionally by mutual associations. The operations of those carrying on insurance are controlled by various Acts of Parliament, so that the interests of the public are fully protected in every way.

Kinds of Policy. Practically all the offices now transact all classes of business, varying according as the policy is a fire policy, a life policy, a marine policy, or an accident policy; and, as the accident section of the business includes all the miscellaneous classes of business, the accident policy conditions vary according to the class of risk insured. Policy conditions are in the main an epitome of common law based on common sense.

Those who are insured should appreciate two of the principles lying behind these considerations, viz., good faith and indemnity. Good faith requires that nothing material to the contract into which an insured may enter shall be withheld from his insurer, and if the insurer can prove that something material to him to know has not been disclosed, the policy issued by him is void.

A policy of insurance is a contract of indemnity, i.e. an insured is only indemnified against any loss or damage sustained by him through the happening of the event he has insured against, but no more. If he were to secure more, he would convert his loss into profit, and this by many legal decisions has been held to be contrary to public policy. Personal accident policies and life policies, however, are not strict contracts of indemnity, the sums payable under them being determined by the amount of the insurance, and not, as in contracts of indemnity, by the loss, but always within the limit of the insurance. Insurable interest is also necessary. Possession does not of itself constitute insurable interest, though the householder's comprehensive policy, including, as it does, the property of himself and his household (including his servants), might suggest this.

Practically every contingency to which human life and property are subject may be covered by insurance. The following, apart from the more usual types of insurance, make some appeal to the householder; key insurance, live stock insurance (for other than fire or lightning damage), plate glass insurance, public liability insurance, baggage insurance (a form of marine insurance), and some of these are included in the householder's comprehensive policy described below.

A Comprehensive Policy. Originally combined policies for the household were confined to the risks of fire and burglary. Later, when accidents to servants were included under the Workmen's Compensation Acts, a householder's liability in this respect was added to this combined cover, other miscellaneous risks being also included. Now a householder can obtain what is called a comprehensive or "all-in" policy, covering the majority of the risks and liabilities to which he is exposed.

A perusal of the prospectus of any reputable insurance company will give full details of the cover granted by such a form of policy. The policy may cover building or contents or both, and the rates charged are, as regards buildings if all the risks specified are covered, 2s. 3d per cent, if certain risks (earthquake, storm and tempest and others) are excluded, 1s. 9d. per cent, or if the cover is limited to fire, explosion, lightning or thunderbolt, 1s. 6d. per cent. Contents policies may be obtained at 5s. per cent in respect of private houses, flats, residential chambers and private dwellings forming part of business premises, but for the last an increased premium may be required. From the contents insurance are excluded motor vehicles and accessories, livestock other than horses, and such things as deeds, stamps, manuscripts, etc., unless stated in the policy.

A condition of the policy is that the full value of the property shall be insured, and the insured is required to sign a declaration which he agrees shall be the basis of the contract; if the sum insured is less than the value, his declaration is false, and in this case the policy can be made void.

Proving a Claim. An insurance of this description has for the householder, besides its inclusive cover, the added attraction of one policy, one premium, one renewal. In the event of a loss arising, an insured person should promptly advise his insurance office, and they will tell him what to do to prove his claim. In this, as in the effecting of the insurance, the essential thing is that he should observe good faith with his insurance office. In effecting an ordinary fire policy, however, covering fire only, an insured is not required to make a declaration as to value, so that it is possible for him to recover any loss up to the amount insured.

Life Assurance. Policies of life assurance differ from other insurance policies in that the latter are in respect to events which may happen, whereas life assurance policies have relation to an inevitable event—death—the common lot. There being no escape from this, the prudent man will provide against it, and this for the man of limited means can best be done by means of life assurance.

In the case of ordinary savings, all that is secured at any time is the actual capital represented by these savings, and any interest accrued, but in the case of life assurance one premium secures a capital sum of from 20 to 40 times the amount of the premium, according to the age at which the assurance is effected, this capital being available at the death of the assured for the benefit of his dependents. Security is thus obtained through the working of two principles: the average duration of a number of lives, ascertained by mortality tables, and the combination of insured lives, so that by regular payments of adequate premiums there is formed the fund from which to provide the capital sums assured as these will necessarily fall due.

Two Kinds of Policy. The two most usual forms of life assurance are whole life assurance and endowment assurance; the former provides for the payment of the sum assured at death, and the latter provides for the payment of this sum at a given age, or at death, if this takes place earlier. In the early years of life assurance the latter form of policy was rare or unknown, but to-

day, for every whole life policy issued, two endowment policies are issued. The premium on the whole life policy may be paid annually, half-yearly, quarterly, or in some cases monthly. If it is imperative that the premiums in early years shall be as low as possible, half premiums may be paid for the first five years; or if the policy is with profits the ordinary premium may be reduced by discounting the bonuses.

The premiums on an endowment assurance may also be paid by yearly or other instalments as agreed, and it may be so arranged that for the first five years the premiums are on the scale of a whole life policy, with the option of having the assurance converted into an endowment assurance after five years on payment of the required premiums.

Premiums may also be arranged to be paid for a limited term of years in respect of whole life policies, these policies, if with profits, still sharing in profits, after all the premiums are paid. Such policies carry special privileges as regards surrender values and paid-up values, each premium securing a proportion of the original assurance.

Thus, if the premiums are limited to 20 payments and the assured for any reason does not wish to continue the assurance, assuming he has paid, say, five premiums, he can obtain a paid-up policy for one-fourth the original assurance, and to this is added any bonuses which have accrued. The surrender values of such policies are similarly higher, and the same is true of endowment assurance policies also, both as regards paid-up values and surrender values.

Term assurances may be taken out to meet special circumstances which may terminate after a certain number of years, and such policies if for a sufficiently long term, carry with them the right of having an ordinary assurance, with appropriate premiums for the age, without further medical examination.

Relief from Medical Examination

The provision relieving from medical examination is of importance, considering that health itself is uncertain. Other assurances are double endowments, securing to an assured a sum double the sum proposed if the life attains the age proposed; if death takes place earlier than the age proposed only the sum originally proposed being paid. Leasehold insurance is of importance to the householder having only a leasehold property, enabling him for a comparatively small premium to provide the capital sum required for the renewal of his lease; pure endowments are endowments only, i.e. payable only if the age for payment is reached. Usually there is a provision for the return of the premiums if death takes place earlier. Children's endowments are usually of this type.

Since the Great War the volume of life assurance business transacted has notably increased, but even now it is probably not on a scale adequate to the needs of the individual householder. So often at the death of the breadwinner the only provision is a life policy, but this, unfortunately, quite inadequate. It has been suggested that the life assurance policy taken out should amount to, say, five times the annual income.

Some of the newer types of policy endeavour to overcome this by an income plan policy, which can be arranged whether the assurance is whole life or endowment. It provides, in the event of death within 20 years of the date of the policy, for the payment of a capital sum, plus an income of one-fifth of the capital sum for the balance of the 20 years. Schemes in connexion with the operations of building societies and staff assurance and pensions schemes have helped to swell the total business transacted. There has also been a notable advance in recent years in the bonuses declared by life offices, probably mainly because of the increased rate obtained by offices on their investments. Many intending insurers are still attracted to the without profits policy because of the immediate maximum cover secured for the premium they may be paying; for many it is still worth while to take out a with profits policy.

The rebate for income tax increases the value of a life assurance policy, and this is obtainable in respect of premiums on policies on a man's own life or on the life of his wife. The tax payable is reduced by a sum representing tax at half the standard rate or less, up to one-sixth of the total income, but if premiums exceed 7 per cent of the sum assured there is no relief in respect of the excess.

Benefits for Children. Other assurances of special benefit for children are educational assurance and deferred assurance. The former may be on the father's own life and provide for payment of a certain sum in the later school years of the children, and it can be arranged that if the father dies earlier the premiums cease. The most recent form of policy combines, with educational benefits for children and family protection, income on retirement and remission of premiums during illness. Children's deferred assurances provide, for comparatively low premiums, policies which may be whole life policies or endowment policies available for the child upon attaining his or her majority.

Proof of age should be submitted at the time a policy is taken out; then all that is necessary to secure payment of the sum assured is the proofs. The proofs of death usually required are registrar's certificate of death, certificate of death signed by the doctor who attended in the last illness, and a certificate of identity from some intimate friend.

A number of policies are taken out for the express purpose of paying death duties, the sum assured being paid over to the Inland Revenue authorities before the issue of probate. This arrangement makes it unnecessary to realize for the purpose of paying death duties any of the property left by the deceased.

Accident and Sickness Assurance. There are three classes of policies: one combined to personal accident only, one combining personal accident with certain specified diseases, originally confined to such as are notifiable to the medical officer of health but now extended to about 60 in all, and one combining

personal accident with all sickness or disease. Sickness means any illness requiring the attendance of a doctor. There are two systems of policy in respect of sickness insurance: one an annual contract under which the premiums are the same irrespective of the age of the insured, though policies will not usually be issued to persons over 55; and the other a permanent contract with premiums varying according to age at entry and computed on an actuarial basis. Certain risks, such as motor-cycling, etc., are only covered by special agreement; the policies, except as stated, are annual contracts and terminable by the office on formal notice, and a pro rata return of premium for any part of the year of insurance that is not expired.

Risks from suicide, intoxication, war, invasion, riot and civil commotion, military or naval service, racing or aviation, are excluded; also in the case of a disease and sickness contract, venereal diseases, drug taking and insanity. Medical expenses are payable under the disease and sickness contract, and there is a system of cumulative bonuses increasing the original sum insured by 5 per cent at each renewal up to 50 per cent should a policy remain continuously in force.

Claims should be notified within 14 or 21 days. Women are eligible for this class of insurance if engaged in some wage-earning profession or occupation, at higher rates than are charged for men, and ordinarily such policies exclude risks arising in connexion with child-bearing.

Property Owner's Insurance. Property owner's insurance is of importance to house-owners or householders because either the owner or occupier of premises may be liable for any injury or loss caused through defects in the premises to any persons coming lawfully thereon. In addition a statutory liability is imposed on houseowners under the Housing Act 1925 to maintain their premises reasonably fit for human habitation. The Act applies only to small houses. Policies are issued to cover claims by the public or by tenants in respect of:

(a) Personal injury or property damage caused by defects in the buildings insured.

(b) Illnesses arising from any such causes. Private houses may be insured for an indemnity of £1,000 at a premium of 6d. a house, though a minimum premium of 2s. per policy may be required.

This particular form of insurance is included in the householder's comprehensive policy as householder's comprehensive policy as part of the general cover.

INSURANCE: THE NATIONAL HEALTH SCHEME

Payments and Benefits that Affect Millions of British Workers

This subject is of interest both to the employer and employed. Other articles that deal in one way or another with their relations are Employers' Liability; Servant. See also Accidents and the entry on Insurance against unemployment that follows.

In Great Britain and Northern Ireland since 1911 the great majority of the workers have been insured by the State against sickness, and since 1926 this scheme has been linked with the one giving pensions to insured persons and their wives on reaching the age of 65, instead of waiting until they are 70. The scheme also provides pensions for the widows of insured persons and allowances for fatherless and orphaned children. All these benefits are covered by a single weekly payment.

The Exceptions. In general all workers between the ages of 16 and 65 must be insured. Certain classes are excepted, the chief being all non-manual workers who are in receipt of a salary of over €250 a year. Manual workers, whatever their remuneration, must be insured, unless they belong to certain excepted employments. Excepted employment, in this sense, is service under the Crown, a public authority; or a railway or other statutory company that provides benefits for its employees that are not less than those given under the national scheme. A certificate of exemption can be obtained by a non-manual worker who has a private income or is otherwise independent. In these cases, however, the employer must pay his share of the weekly contribution. Otherwise he would be under a temptation to give preference to persons who can obtain exemption from the insurance payments. Persons who need not be compulsorily insured can insure as voluntary contributors. Such pay a smaller weekly premium, if they are not entitled to medical benefit.

Contributions. The ordinary rate, of health and pensions contribution is 1s. 6d. a week for men, and 1s. 2d. a week for women. Persons who are employed while they are over the school leaving age, but under 16, must now be insured for medical benefit. The contribution is paid by affixing a health and pensions insurance stamp to a contribution card. Contributions at the above rates cease to be payable when the insured person reaches the age of 65. Where, however, a person is insurably employed after the age of 65, a weekly contribution of 10d. (man) or 7d. (woman) is payable by the employer.

In the case of an employed contributor, a contribution is payable for every contribution week, i.e. from Monday to the following Sunday during the whole or any part of which the contributor is employed

or for which he receives wages, but no contribution is required to be paid for any week during which the member is prevented by sickness from working, whether he receives wages or not.

The whole of the contribution is payable in the first instance by the employer, and must be paid by stamping a card at or before the time of payment of wages for the week for which the contribution is due. The employer is then entitled to recover by deduction from the wages the employee's share of the contributions so paid. The employee's share is ordinarily 10d. in the case of men, and 7d. in the case

of women, but in certain cases of low wage earners the employee's share is less, as explained on the contribution card. No part of the contributions payable for employed persons over 65 is recoverable from the employee. An employed contributor is entitled to be excused arrears for weeks in which he was available for, but unable to obtain, employment on producing evidence of his inability.

The Benefits. The ordinary benefits to which insured persons are entitled in return for contributions in respect of health insurance are— medical, sickness, disablement and maternity.

Medical benefit consists of the provision of medical attendance and treatment, including treatment and attendance for tuberculosis and the provision of proper and sufficient medicines and such medical and surgical appliances (and chemical reagents) as are named in the regulations made by the Minister of Health. It does not include medical attendance or treatment in respect of a confinement, which is the subject of a separate benefit.

Sickness benefit means periodical payments during incapacity for work caused by some specific disease or bodily or mental disablement of which notice has been given, commencing ordinarily on the fourth day of such incapacity and continuing for a period or periods not exceeding 26 weeks in all. Disablement benefit is a continuation of the periodical payments at a lower rate in respect of incapacity after the period of sickness benefit has been exhausted. The right to sickness and disablement benefits ceases when an insured person reaches the age of 65, but, subject to the necessary conditions having been satisfied, a contributory old age pension then becomes payable.

The ordinary rates of sickness benefit are 15s. a week for men and 12s. for women (10s. if married), but until a person has been insured for 104 weeks and 104 weekly contributions have been paid sickness benefit is payable at the reduced rates of 9s. for men and 7s. 6d. for women. The normal rate of disablement benefit is 7s. 6d. a week for men and 6s. for women (5s. if married). All these rates are subject to reduction when the member is in arrears with his weekly payments.

Maternity benefit consists of the payment of a sum of 40s. on the confinement of the wife (or, in the case of a posthumous child, of the widow) of an insured man, or of a woman (whether married or unmarried) who is herself insured. The benefit is paid by the approved society concerned. If a woman is herself insured, she is entitled to maternity benefit from her society in respect of her own insurance, and in the case of a married woman this is additional to any maternity benefit payable by her husband's society in respect of his insurance.

Sickness, disablement, or maternity benefit is not payable to any person in respect of a period when such person is an inmate of a hospital or similar institution supported by a charity or by voluntary subscriptions or out of public funds; but it can be devoted to the relief of his dependents or to defraying the expenses of the hospital or accumulated until he is discharged.

Married Women. An insured woman who marries is required to give notice of her marriage to her society within eight weeks thereafter, and any woman who fails to comply with this requirement is liable to a penalty. If owing to the failure of a woman member to notify her society of her marriage more sickness benefit is paid to her than she is properly entitled to receive, the society is entitled to deduct the excess from any benefits which may subsequently be payable to her.

An insured woman who marries and who, immediately before her marriage, had already ceased all work for eight consecutive weeks, or who completes that number of weeks without working within the year immediately following her marriage, comes under special provisions as to health insurance benefits on her marriage or on completion of the eight weeks without working (whichever first occurs). In reckoning this period of eight weeks no account is taken of weeks of sickness of which the society is notified at the proper time, or of weeks during which the woman shows to the satisfaction of the society that she was available for, but unable to obtain, employment.

The Insurance Card. Every insured person is required to obtain a contribution card from his society or from a post office, and his employer can demand its production at any time. It must be delivered to the employer on the commencement of an employment and whenever he may reasonably require it for the purpose of paying contributions, or for production to an inspector or to any other authorized person.

There are two methods of arranging for the custody of the card during its currency. The first is for the employer and worker to agree that the employer shall keep the card, in which case he is responsible for its safety; he must stamp it regularly at the proper times and must return it to the worker upon the termination of the employment, or, if the worker leaves without notice, within 14 days; upon the expiration of the period of currency of the card or within six days thereafter; and where the worker at any time so requests within 48 hours after the receipt of the request.

The other way is for the worker to keep the card, and this must be done unless the employer and worker agree that the employer shall keep it. When the worker keeps his card the employer must, on each occasion of stamping, return it to him as soon as he has stamped it. On the death of a worker whose card is then in the hands of his employer, the card should be forwarded to the insurance department of the Ministry of Health as soon as possible.

Joining a Society. To obtain the full advantages of insurance it is necessary to join an approved society. An insured person can join a society at any time. A list of approved societies, giving the addresses of their secretaries, may be seen at the office of the local insurance committee, or at any employment exchange, or district office of the Ministry of Health, Insurance Department.

To join an approved society, the first step is to ask the secretary, or agent, of the society selected for a form of application for membership. After this is filled up and sent in, the applicant should receive within a reasonable time a notification from the society that he has been accepted or rejected, as the case may be, and he should make further inquiry if he does not receive notification within one month after application. An insured person who does not join an approved society within a certain time becomes a deposit contributor.

At the end of every half year an insured person must send up his contribution card to his society, or, if he has not joined a society, to the Ministry of Health, Insurance Department, or to the Welsh Board of Health, according to the instructions printed on the card. No credit can be given for the contributions until the card is received by the society or the Insurance Department.

INSURANCE: Against Unemployment. The national scheme for insuring persons against unemployment was introduced in Great Britain in 1911. At first it was confined to certain specified classes of workers, but in 1916 many munition workers were brought in. In 1920 there was a large extension, and the scheme now applies to all employees over the school-leaving age, except non-manual workers who receive over £250 a year, and certain other classes.

Exempted Classes. Apart from these non-manual workers the chief classes of persons who need not be insured under this scheme are agricultural labourers and domestic servants. Employees of local authorities, of railways and other public utility undertakings, and also persons with rights under statutory super-annuation schemes, are exempt if the Minister of Labour grants a certificate. Other industries can set up insurance schemes of their own, and if the minister thinks these are satisfactory the employees therein can obtain exemption from the national scheme. To be satisfactory these schemes must give benefits at least equal to those of the national scheme.

Weekly Contributions. The contributions to this scheme are paid in the same way as contributions to the National Health Insurance scheme. Every week the employer must stamp a card for each employee insured. Part of the cost of this stamp falls on himself, but part he can deduct from the wages of the employee.

Contributions cease to be payable when the employee reaches the age of 65, as he or she is then qualified for an old age pension.

There are also allowances for dependents— 10s. for an adult (agriculture 7s.) and 3s. for a child. No contributions are required during periods of unemployment.

To obtain the benefit the unemployed person must prove: (1) That no fewer than 30 contributions have been paid in respect of the two years immediately preceding the date on which application is made. (2) That he or she has made application in the prescribed manner, and proves that since the date of the application he has been continuously unemployed. (3) That he or she is capable of and available for work. (4) That, if so required, he or she has duly attended an approved course of instruction. The Act of 1930 repealed a condition in the 1924 Act, "that the applicant is genuinely seeking work, but unable to obtain suitable employment."

The weekly contributions are :

	Agriculture		Other Employment	
	Em-ployee	Em-ployer	Em-ployee	Em-ployer
	d.	d.	d.	d.
Men (21 to 65)	4	4	9	9
Women (21 to 65)	3½	3½	8	8
Young Men (18 to 21)	3½	3½	8	8
Young Women (18 to 21)	3	3	7	7
Boys (16 to 18)	2	2	5	5
Girls (16 to 18)	1½	1½	4½	4½
Boys (14 to 16)	1½	1½	2	2
Girls (14 to 16)	1	1	2	2
Men (65 or over)	—	4	—	9
Women (65 or over)	—	3½	—	8

Rates of Benefit.

	Agriculture	Other Employment
	s. d.	s. d.
Men	14 0 a week	17 0 a week
Women	12 6	15 0
Young Men (18 to 21)	10 6	14 0
Young Women (18 to 21)	9 6	12 0
Boys (17 to 18)	6 0	9 0
Girls (17 to 18)	5 0	7 6
Boys (under 17)	4 0	6 0
Girls (under 17)	3 6	5 0

Disqualifications. A claimant is disqualified for receiving benefit if it is proved by an officer of the Ministry of Labour; (1) that he or she has, without good cause, refused or failed to apply for or refused to accept a suitable situation notified to him or her as vacant or about to become vacant; or, (2) that the claimant has, without good cause, refused or failed to carry out any written directions given him or her, with a view to assisting him to find suitable employment.

A worker is disqualified if he or she is unemployed owing to a stoppage of work which is due to a trade dispute, or if he or she has left his work through misconduct or without just cause. He or she is disqualified, too, if the inmate of a prison or workhouse, or if in receipt of an allowance under the health insurance scheme.

The benefits are paid out at the employment exchanges, or, if the insured prefers, through a trade union. The officials of the exchanges are responsible

for verifying the claims made. Disputes are settled by courts of referees. Both employers and employees have representatives on these courts and the chairmen are appointed by the Ministry of Labour.

INTARSIA. This is a way of inlaying wood which is now practically identical with marquetry. In its origin intarsia was the inlaying of one or more colours upon a lighter or darker ground, while marquetry proper is composed of pieces of thin wood or other material of equal thickness laid down upon a matrix and fastened with glue. *See* Inlaying; Marquetry; Mosaic.

INTENSIFIER: In Photography. When a negative, whether on glass or on a film, is too thin to give a satisfactory print, it may be subjected to a process of intensification whereby, in suitable cases, a negative which gave a flat print with poor detail may be made to give a quite satisfactory silver print. The amateur, however, should be extremely cautious in using any of the intensification processes detailed below, particularly if the negative is one which is valued.

The mere re-wetting of a negative is frequently attended with risk of stain or other damage. Under the best conditions some intensifiers, particularly those containing mercury, are liable to attack the gelatine, causing holes or reticulation, i.e. a series of wavy cracks in the gelatine of the negative. They also shorten the life of the negative.

Every effort, therefore, should be made to obtain satisfactory prints before resorting to intensification. If it is decided that a negative must be intensified, first make the best print that can be obtained on vigorous gaslight paper to keep in reserve.

It is useless to attempt to improve the printing strength of a negative which gives flat prints because it is fogged; the intensifier will simply increase the fog and make the result worse. If the negative is free from fog the edges which have been held in the dark slide will be seen to be perfectly clear. Make certain that the plate or film has been thoroughly fixed and properly washed; a trace of hypo left in the negative is almost bound to cause irregular stains after intensifying. See that the surface of the negative is free from smears, stains, or a chalky appearance, the latter indicating insufficient washing.

One of the safest processes is the following: The negative is first placed in a solution of 20 gr. of alum to 1 oz. of water to harden and clear it, leaving it in the solution for about ½ hour. It is then washed and placed in a solution made by dissolving 30 gr. of potassium bichromate in 3 oz. of water and adding 1 dram of hydrochloric acid.

The hydrochloric acid should be the pure acid obtained from the chemist, and not spirits of salt; 60 drops can be counted out if a dram cannot be measured. The negative will quickly become white, and the action should be allowed to continue until the bleaching is complete; it is then washed until the whole of the yellow stain is removed, which will take anything up to an hour.

When it has been thoroughly washed the negative is re-developed in a non-staining developer, such as amidol or metol-hydro-quinone. When it will darken no more, wash well and dry. This intensifier is best suited to cases where the negative has been properly exposed but is under-developed, i.e. it is clear and bright, but thin. If the amount of intensification is insufficient, the process can be repeated, omitting the alum bath.

For a negative that is thin through underexposure and has not been seriously overdeveloped, uranium intensifier will give good results, provided the negative is absolutely free from hypo. The solutions are:

A	
Uranium nitrate	50 gr.
Water to	5 oz.

B	
Potassium ferricyanide	50 gr.
Water to	5 oz.

Mix 1 oz. each of A and B, and add 1 dram of acetic acid. After intensification wash in several changes of water (not running water) until all stain is removed.

For a plate that is over-exposed but not over-developed, i.e. it is thin but has a veiled and flat appearance, the mercury and ammonia intensifier may improve matters. It is liable to cause pinholes and discoloration after a time; as explained above, it should be used with caution. The bleaching solution is made up of:

Mercuric chloride (corrosive sublimate)	50 gr.
Hydrochloric acid	25 min.
Water to	5 oz.

The hydrochloric acid is dropped on the powdered mercuric chloride, and the water then added.

Note that the solution is extremely poisonous.

The negative, being soaked as before in clean water, is placed in the above solution and the dish rocked until the back of the plate appears quite white. Wash thoroughly in running water for about ½ hour, and then blacken in the following solution:

Ammonia (strength •880)	20min.
Water to	1 oz.

It may also be blackened in hydroquinone, pyro-ammonia, or ferrous oxalate developer. *See* Developing; Fixing; Hypo; Washing.

INTERFERENCE. In a wireless receiver this is the interruption caused by unwanted signals, e.g. undesired broadcast transmissions, atmospherics, induction from electrical machinery, etc., on the wavelength to which the set is tuned. *See* Selectivity.

INTEREST. Interest is money paid for the use of money. It is calculated at so much per cent, i.e. per hundred, and varies according to the standing of the borrower, the state of the money market, and other matters.

As it is occasionally necessary to calculate interest in household matters—for instance, when a house has been bought or built by the aid of a mortgage—the following method may be found useful: Divide the amount of the loan by 100 and multiply the answer by the rate of interest. Thus, if a man borrows on his house £450 at 3½ per cent., he should divide £450 by 100, i.e. 4½, and multiply the 4½ by 3½, i.e. the annual interest will be 15¾, i.e. £15 15s. It is well to remember that 5 per cent is exactly a shilling in the £, and 2½ per cent is sixpence.

Interest is usually paid half-yearly or quarterly, and the borrower is usually entitled to deduct income tax from the amount he pays. Income tax, however, is not deducted from the interest on bank overdrafts, but the amount paid can be deducted from the income when the return is sent in. Interest on these overdrafts is charged quarterly. *See* Banking; Building Society; Mortgage.

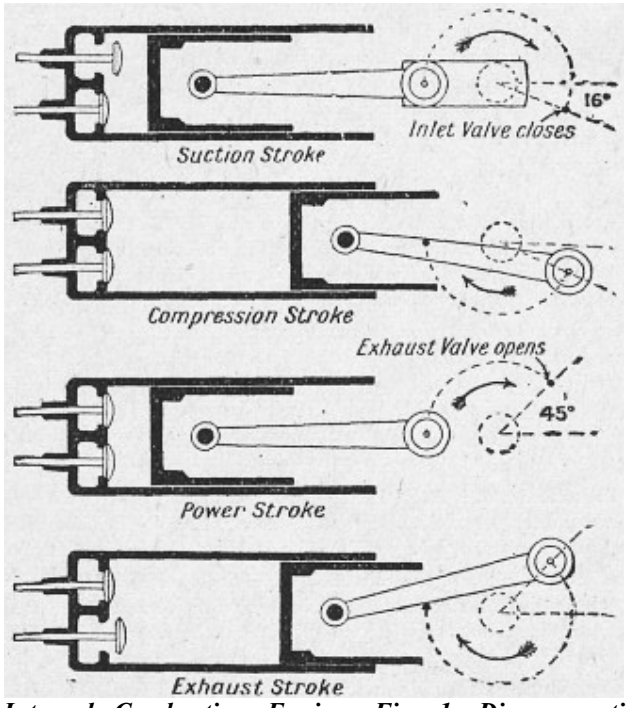
INTERNAL COMBUSTION ENGINE.

There is an essential difference in the working of the internal as compared with the external combustion engine. With the latter, the fuel may be consumed away from the engine, which is the actual power producer. In the steam engine, for instance, fuel is consumed under the boiler, thus raising the water to a sufficient heat to give off the steam, which is conveyed to the cylinders.

With the internal combustion engine the conditions are entirely different. The fuel is gaseous, or is rendered so by vaporisation, and is burned in the engine. We may take the petrol engine as the type. Through the medium of the carburetter the fuel is drawn into the cylinder in a semi-liquid form, composed of a mixture of air and sprayed petrol. This is turned into a highly explosive petrol gas as it enters the engine, and is exploded through the medium of the high tension spark that is caused to jump the points of the sparking plug at precisely the right moment.

Fig. 1 illustrates the Otto, or four-stroke cycle of operations. The diagram shows the four strokes of the piston that go to produce one power impulse, namely, induction, compression, explosion or power stroke, and exhaust. As the piston has to descend and ascend during one complete revolution of the crankshaft, two complete revolutions of the crank go to make one cycle of operations. No matter whether the engine has one or a dozen cylinders, the cycle of operations will be the same for each; the only difference is the firing-periods.

In the cycle of operations the chief factor is the valves, two of which are employed, an inlet and exhaust valve, for each cylinder of the engine. The inlet opens at the commencement of the induction stroke and closes at the end; the exhaust valve remains on its seating. Both valves remain closed during compression and the firing or power stroke. Finally the exhaust valve opens on the exhaust stroke, the inlet valve remaining on its seating; at the end of the exhaust stroke the inlet valve again opens, and so the operation goes on. The valves are operated by the camshaft. Ignition is carried out usually by a high tension magneto, driven at crankshaft speed, or by a coil and accumulator.



Internal Combustion Engine. Fig. 1. Diagrammatic drawing showing the Otto or four-stroke cycle.

Two-Stroke Cycle. The difference between the two-stroke engine and the four-stroke is that the former has one power stroke at every downward stroke of the piston, and the latter at every alternate down stroke. There are three main working parts, the piston, connecting rod, and crankshaft, no valves, timing gears, camshaft, and tappets being required. The half-compression valve or decompressor shown in the diagram is provided to facilitate starting the engine.

The cycle of operations is shown in Fig. 2. The initial induction and compression of the fresh charge takes place below the piston and in the crankcase. There are four ports positioned in the cylinder walls and controlled by the movement of the piston, the sequence of operations being as follows:

The piston rises and creates a partial vacuum in the crankcase. On rising further, the inlet port is uncovered, thus allowing the fresh charge to enter, assisted by the vacuum created. On the completion of the up stroke the piston descends and compresses the charge in the crankcase, and just before the stroke is completed, uncovers the transfer ports, allowing the compressed charge to pass via these to the top of the piston.

After the piston has risen a little way the transfer ports are closed, and the further rise of the piston

compresses the charge that is now on top of the piston in readiness for the explosion to take place immediately the piston commences the down stroke. During the down stroke the same cycle of operations is going on below the piston in readiness for the opening of the transfer ports. This cycle is common to all two-stroke engines.

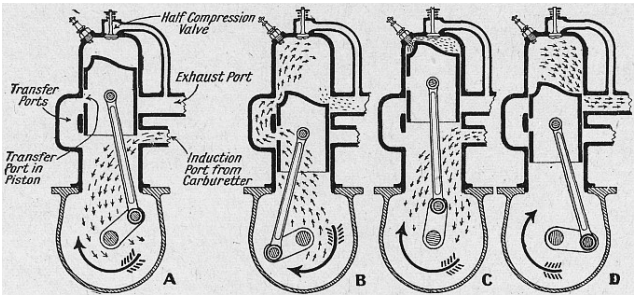
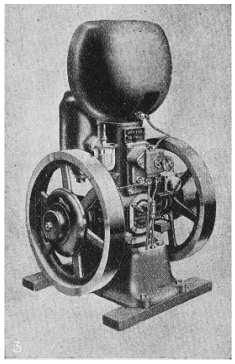
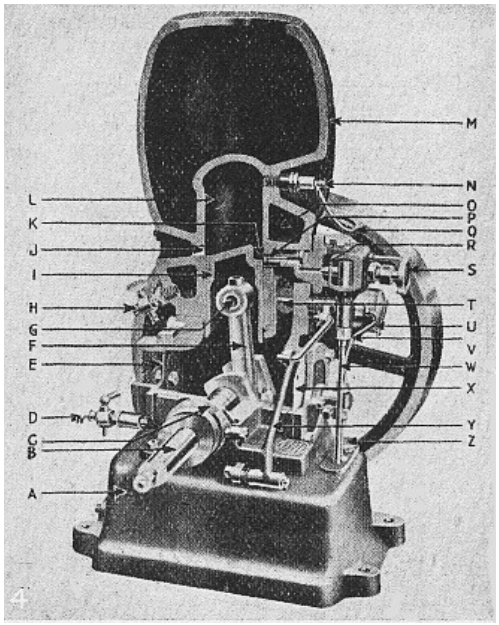


Fig. 2. A, induction and compression; B, transfer to cylinder; C, explosion; D, exhaust.



Internal Combustion Engine. Fig. 3. Fetter 3 B.H.P. 'Universal' paraffin or petrol engine.

Fig. 4. Sectional view. A. Fuel tank base. B. Crank-shaft (flywheel removed). C. Governor thrust block. D. Oil drain cock. E. Air inlet plate. F. Connect-ing rod. 6. Gudgeon pin. H. Cylinder jacket drain cock. I. Piston. J. Exhaust



port. K. Inlet port. L. Cylinder. M. Water hopper. N. Sparking plug. 0. Water jacket. P. Fuel nozzle. Q. High-tension cable. R. Fuel chamber. S. Fuel regulator needle. T. Throttle. U. Magneto. V. Fuel delivery pipe. W. Fuel drain pipe. X. Fuel pump diaphragm. Y. Governor lever. Z. Fuel filler cap.
(Courtesy of Petters, Ltd. Yeovil)

As the fresh gases enter the cylinder when the burnt gases are passing out through the exhaust ports, a certain proportion of the fresh gas is bound to mix with and pass out with the exhaust residue. This fault is guarded against as far as possible by the provision of a baffle cast on the piston head that tends to deflect the fresh gas to the top of the cylinder, thus keeping it for as long as practicable from coming into contact with the exhaust. Figs. 3 and 4 show a two-stroke stationary engine. *See* Big-End; Camshaft; Carburetter; Crankshaft; Lubrication; Motor Car; Motor Cycle, etc.

INTESTACY. An intestate is a person who dies without having made a valid will disposing of all his property. The property of an intestate is used first in payment of the funeral and other expenses and debts, and the residue is distributed in accordance with certain rules. In English law no distinction is now made between real and personal property. If the intestate leaves a husband or wife he or she takes all the personal chattels of the intestate—i.e. such things as furniture, silver, jewelry, motor cars and the ordinary contents of the home, and in addition a sum of £1,000 absolutely. After this payment has been made any residue left over will, if the intestate has left no descendants, be held in trust for the husband or wife for life—i.e. he or she will receive the interest on the money, but not the capital sum.

If there are descendants the husband or wife will get a life interest in half only of this residue and the descendants will take the whole residue subject to that life interest upon what are called the statutory trusts. That means that the children will divide the property equally, each becoming entitled to his or her share on attaining the age of 21 or marrying before that age. If a child of the intestate has predeceased him or her, any children of that child living at the death of the intestate will take the share to which their parent would have been entitled had he or she survived.

If the intestate leaves no descendants the following classes take in order, subject to a life interest to any husband or wife: (1) The parents or parent. (2) Brothers and sisters; (3) Half brothers and sisters; (4) Grandparents; (5) Uncles and aunts of the whole blood; (6) Uncles and aunts of the half blood. In each class, any child living at the death of the intestate of any deceased member of that class will take the share the parent would have taken had he or she survived.

If no member of any of these classes exists all the property will go, not for life but absolutely, to any husband or wife and, if there is none, then to the crown.

If the intestate was illegitimate and leaves neither husband nor wife nor descendants all the property will go to the crown. In such cases the crown will, as a rule, provide for any dependants of the intestate and for any persons to whom the intestate might reasonably have been expected to leave the property had he or she made a will. It will be noticed that the effect of the present law is to make it impossible for anyone more distantly related than a cousin to succeed to an intestate.

INTESTINE: Its Ailments. The bowel or intestine is a long muscular tube, lined with mucous membrane, which extends from the pyloric end of the stomach to the anal opening and is about 28 ft. in length. The first 10 in. is called the duodenum, the next 8 or 9 ft. the jejunum, and the following 12 to 13 ft. the ileum. These three divisions constitute the small intestine. The remainder, 4 to 7 ft., is the large intestine and consists of the caecum, the colon, and the rectum. The vermiform appendix, inflammation of which constitutes appendicitis, is a narrow tube emerging from the wall of the caecum. It communicates with the bowel, but is closed at the other end. The important role of the intestine in the processes of digestion is dealt with under that heading.

The intestines are subject to a large number of diseases. Inflammation may attack the intestine as a whole (enteritis), and also involve the stomach (gastro-enteritis), or affect only a part of the intestine, as the caecum (typhlitis), the colon (colitis), the appendix (appendicitis), the rectum (proctitis). It may be acute or chronic, a mild catarrh, or a severe ulcerative form.

Improper diet is one of the chief causes. Tainted meat, unripe fruit, bad beer, the frequent use of irritating purgatives, chilling of the abdomen, may all set up inflammation. The common symptoms are griping, colicky pains, diarrhoea, thirst, nausea, and loss of appetite, headache, languor, and prostration.

In cases due to errors in diet two to four grains of calomel may be given at once, or else from two teaspoonfuls to a tablespoonful of castor oil, with ten minims of laudanum added. Let the patient rest in bed. The food must be warm and liquid—skimmed milk, boiled arrowroot, well-beaten eggs, strained gruel. To relieve the pain, a large mustard plaster, fomentations or linseed poultices may be placed on the abdomen until the pain is easier. If diarrhoea is severe or is prolonged, a doctor should be called in.

Sagging and Obstruction

Sagging of the intestines is known as enteroptosis, and is generally associated with descent of stomach, kidneys, and sometimes liver and spleen. The common causes are poor development, a rapid loss of fat, tight-lacing, many pregnancies, etc. Flatulence and constipation, neurasthenia, and a large variety of other symptoms may be present. Keep the bowels regular by means of laxatives such as two to four grains of cascara at night or liquid paraffin. A well-fitting abdominal belt often gives relief. Strengthen the abdominal walls by massage.

Obstruction of the intestines may arise from a large number of causes outside, in the wall of, or within the intestine. In an acute attack severe pain is suddenly felt, perhaps after a violent muscular effort. At first the pain comes in spasms, and commonly in the region of the navel; then it becomes continuous and agonizing. Vomiting soon appears; at first the stomach contents, then of bile, and finally of faecal matter. The doctor must be summoned instantly. Purgatives are most dangerous, and should never be given.

Tuberculosis of the intestine may occur through infection by ingested milk or other food, or may accompany tuberculosis of the lungs. It occurs frequently in cases of the latter. The prominent symptoms are colicky pains and diarrhoea, with perhaps some blood and pus in the stools.

Duodenal ulcers occur, as a rule, in males between twenty and forty years old, and are usually preceded by months of more or less constant dyspepsia. Pain, three or four hours after meals, may be felt in the stomach region. It frequently assumes the character of hunger pain, which comes on just as the patient is beginning to be hungry, and is relieved by taking food. There is generally blood in the stools, though it is not always obvious. Vomiting is common, and the vomit may contain blood. In some cases medical treatment may be advised instead of operation. *See* Appendicitis; Colitis; Constipation; Diarrhoea; Digestion; Piles, etc.

INULA. These vigorous hardy herbaceous plants, rather coarse in appearance, bear large yellow daisy-like flowers in late summer. They flourish in ordinary soil and are increased by division in autumn or by seeds sown out of doors in May. Glandulosa, Hookeri and Royleana, all about 2 feet high, are the best; ensifolia, 9 in. high, is suitable for the rock garden.

INVALID COOKERY. The actual diet will be prescribed by the doctor, but the cook must be able to present it attractively and with sufficient variety to tempt the patient's appetite. Hot food must be served really hot, and cold food quite cold.

Much depends on the serving. A patient may refuse a dish which, if more attractively served, he would eat with enjoyment. Jellies, puddings and moulds are more appetizing served complete than as a helping, and soups, etc., more attractive in a dainty bowl than in a cup or soup plate. Highly flavoured things are to be avoided.

It is a mistake to send up large quantities of food to a sick-room, as the patient's appetite will probably disappear at sight of it.

Low diet consists of slops, and it is almost entirely fluid. A little bread or toast will represent all the solid part of it. For such diet the cook should send up some kind of liquid food at two-hourly intervals, varying her menu between milk, beef tea, gruel, Benger's food and such things. A liberal supply of barley water and lemonade is generally appreciated.

Light diet is usually understood to include fish, eggs, chicken, and milk puddings, thus giving the cook a wider scope for her ingenuity. Lightly-boiled or coddled egg and poached egg are suitable for invalids, while scrambled eggs are appetizing as well as wholesome. Both fish and chicken are best steamed, but as the patient progresses he may have the chicken roast and the fish baked.

Full diet will include everything eaten by the normal person, with the reservations mentioned at the beginning of this article.

Among vegetables suited to invalid diet are potatoes

(most digestible when mashed or baked), cauliflower, vegetable marrow, well-boiled onions, spinach, asparagus, stewed tomatoes, and stewed celery. Of meats and fish the most digestible are chicken, turkey, pheasant (the breast especially), most kinds of birds, mutton, lean, tender beef, whiting, brill, soles, plaice, halibut, trout, turbot.

With specialized diets for definite diseases such as diabetes, chronic rheumatism or certain forms of heart disease the doctor will issue detailed instructions, for the cook to follow implicitly. *See* Beef Tea; Diet; Gruel; Imperial Drink, etc.

INVENTORY. An inventory is a detailed list in writing of furniture and other goods, usually drawn up for a particular purpose. When a furnished house is let it is usual to make an inventory of the furniture and utensils left therein, and when a house changes hands an inventory is made of the fittings, etc., which the incoming tenant is taking over. Such inventories are best made by an estate agent.

Sometimes an inventory of property and other possessions is made in connexion with the proving of a will, while an inventory of the personal possessions of the borrower must be attached to a bill of sale. *See* Executor; Furnished House; Will.

INVISIBLE MENDING. This term is used for a kind of mending which not only repairs the rent or hole, but removes all traces of its presence. It is generally left to tailors and others who make a speciality of it, but can be done, with varying degrees of success, at home. *See* Mending.

INVITATION. All formal invitations are written and answered in the third person. The usual form runs as follows: "Mrs. S. requests the pleasure of the company of Mr. and Mrs. K. on Saturday, Nov. 10, at such and such a time." If an answer is required it is usual to put R.S.V.P. in the right-hand corner; but in any case it would be extremely bad manners not to answer.

The reply would run thus: "Mr. and Mrs. K. have "(not "will have")" much pleasure in accepting Mrs. S.'s kind invitation for Saturday, November 10," or "regret they are unable to accept." It is to be noted that an invitation should be answered to the person from whom it is sent as designated by him or herself. For example, if it comes from Mrs. Arthur Walker, the reply should be addressed to Mrs. Arthur Walker. The reply should be prompt. Much inconvenience is caused by people who forget or neglect to answer invitations until the last moment.

Wedding invitations are sent out by the bride's family. They are sometimes printed in silver, and are usually on a folded sheet of good notepaper. The wording is as follows: "Mr. and Mrs. Arthur Walker request the pleasure of Mr. and Mrs. Robinson's company at the marriage of their daughter, Mary Elizabeth, with Mr. Richard Kent, at St. Peter's Church, Eaton Square, on Saturday, November 10, at 2 o'clock." If the wedding is to take place out of London some people add a note in the corner giving times of trams, the nearest stations, etc. *See* At Home; Bridge Party; Dance; Dinner Party; Etiquette; Evening Party; Wedding.

IODINE. A non-metallic element occurring in dark lustrous crystals, and procured largely from the ashes of burnt seaweed, is called iodine.

As a counter-irritant the tincture, the strong tincture, and the ointment are frequently used in chronic inflammations of the joints, swollen glands, pleurisy, etc. Painted on a bunion or chilblain, tincture of iodine sometimes markedly reduces the pain and swelling. The colourless tincture of iodine or iodine ointment is suitable for exposed parts.

Iodine is a powerful germicide. Accidental wounds may be painted or daubed with tincture of iodine, the surrounding skin also being dealt with. There is some smarting, but this quickly passes off.

For iodine poisoning give an emetic (q.v.), and immediately send for the doctor.

It is useful to remember that a weak solution of photographic hypo will remove iodine stains from clothing.

I.O.U. An I.O.U. is a piece of paper in this form:

March 1, 1938.

To Mr. John Smith

I.O.U.
Twenty pounds.
(Signed) W. Jones.

This is an acknowledgment of indebtedness only, and is very strong evidence that Jones owes Smith £20, but not that the transaction was necessarily a loan. But it is not a contract or agreement. Nor is it like a bill of exchange or promissory note, which is negotiable; nor does it need to be stamped, as those documents do. If the I.O.U. goes on to say, "I promise to pay you the money on the 1st of June," it is a contract or promise to pay, and must be stamped as a promissory note or with a sixpenny agreement stamp, or as a promissory note. *See* Promissory Note.

IPECACUANHA. The dried root of a Brazilian plant yields the drug ipecacuanha. The dose of the powdered root is one half to 2 grains when used as an expectorant, 15 to 30 grains when used as an emetic.

Ipecacuanha is a reliable emetic, but it acts slowly. As such, one of its chief uses is to clear out the clogged-up air passages in chest diseases in children who have not yet learned to cough. The vomiting induced by the ipecacuanha, together with the expectorant effect of the drug, causes the accumulated mucus, etc., to be thrown out of the bronchial tubes. The compound powder of ipecacuanha (Dover's powder) is frequently prescribed as a diaphoretic in slight fever.

IPOMOEA. These are quick-growing climbing plants. Some of them may be grown out of doors, while others are suitable only for a heated greenhouse. Ipomoea rubro-caerulea, which bears beautiful blue flowers in summer, is raised from seeds under glass in spring and may be grown in the greenhouse or planted out of doors in a warm sunny place in late May. Coccinea, bright red, and versicolor, red and yellow, are others that may be grown in a similar way. The correct name of the common Morning glory (Convolvulus major) is Ipomoea purpurea. Horsfalliae, rose coloured, and Learii, blue, must be grown in a hothouse. Bona-nox, white, is suitable for the greenhouse.

IRESINE. This plant, which is grown for the sake of its coloured leaves, is a favourite for summer bedding and is also useful in the greenhouse. It is easily increased by cuttings of the young shoots in spring in warmth under glass; if subsequently potted in 3-inch pots they will be well rooted by early June when, after having been hardened off, they may be planted out of doors. A compost of loam, leaf-mould and sand is suitable. The favourite kinds are Herbstii and Lindenii, with dark red leaves, and aureo-reticulata which has red and yellow leaves.

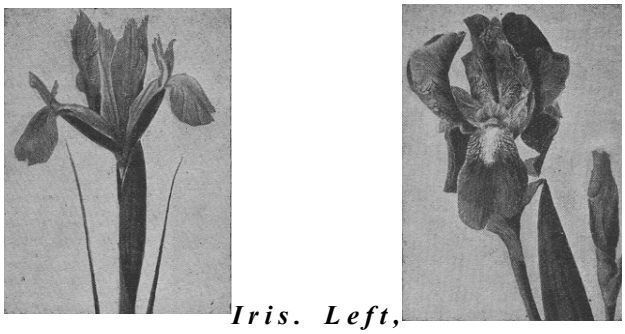


Iresine. Decorative coloured leaves of the greenhouse variety, lindenii.

IRIS. This is one of the most important groups of garden plants; a selection of the best kinds will provide flowers from early spring until late summer. The chief types are the May and June flowering bearded irises; the beardless irises and the Japanese irises which bloom in summer; and the early and late bulb irises which are at their best in spring and summer respectively.

The bearded flag irises are beautiful plants distinguished by sword-shaped leaves and large flowers of brilliant and varied colouring, in May and June. The common purple flag iris (germanica), the best known of these, will thrive in partial shade, but the finer varieties need a sunny place. They may be planted from July to September in well dug soil to which lime has been added if necessary; they do not flourish in soil which lacks lime. An application of superphosphate of lime, 2 oz. per square yard, to the soil is beneficial. Care must be taken not to bury the rhizome or root stock deeply: it should be only partially covered with soil.

A few of the best of the numerous varieties now available are (May-flowering) Florentina, white, Kharput, purple, Zwanenburg, bronze and yellow, Queen Flavia, pale yellow, and Charmant, blue purple. Of the June flowering varieties these are exceptionally fine: Rhein Nixe, crimson purple and white, Alcazar, mauve and purple, Archevêque, purple, Albert Victor, avender blue, Caprice, rose-red, Lord of June, lavender-blue, Standard Bearer, rose-crimson, Ma Mie, white with blue margin, Ambassadeur, crimson bronze, and Darius, yellow. The dwarf bearded irises (pumila) which bloom March to May are valuable plants for the rock garden and for sunny borders.



Iris. Left, early-flowering Spanish; right, bearded or common flag.

Among the beardless irises (which have no crest or beard on the falls or lower petals) are the lavender blue Siberian iris (sibirica), aurea, yellow, Monnieri, yellow, orientalis, blue, the common yellow flag (pseudacorus) and the monspur varieties of several colours; all these like deep moist soil and are suitable for borders and the waterside. The beautiful Algerian iris (stylosa) which bears lavender blue blooms in winter is in this group; it should be planted in spring at the foot of a sunny wall in well drained soil containing mortar rubble.

The Japanese irises (Kaempferi) bear large, flattish, brilliantly coloured flowers in summer; they should be planted in moist soil by the waterside and must have a sunny place.

Bulb Irises. Among the bulb irises the Spanish and English are favourites. The former bear blue, white or yellow flowers in June, the latter open in July, the flowers being shades of mauve, purple and rose. The proper time to plant the bulbs is in October, those of the Spanish irises being set 2 inches deep and 4 inches apart, those of the English irises 3 inches deep and 8 inches apart. The miniature bulb irises which are in full beauty in spring are very charming in the rock garden or for cultivation in pots in the cold greenhouse: reticulata, violet, Danfordiae, yellow, and histrio, blue, are some of the best. The bulbs should be set in rather light well drained soil in September.

In addition to those named many species or wild types are cultivated and the oncocyclus or cushion irises which need special treatment—a sunny position, a raised bed of well drained gritty soil and suitable protection in winter—have many admirers.

Iris Diaphragm. *See* F. Number; Stop.

IRISH HEATH. This is a beautiful flowering shrub about 15 inches in height, with drooping, crimson-purple flowers. There is a beautiful white variety, alba. Its culture is the same as for the heaths.

(Continued in page 1145)



Purple and red English

Early-flowering Spanish

Jacquiniana, or common "Flag"

Hybrid double Japanese

IRIS: FOUR VARIETIES FOR BRITISH GARDENS

Instructions for the choice and culture of irises are given under the heading Iris.



'H,' 'I,' AND 'J' RECIPES: SHOWN IN COLOUR.

Haddocks, grilled with Tomatoes. Follow instructions for haddock, adding tomato. Jelly Orange. A variant of the sweet called Orange Basket. Italian Jelly. Make some raspberry or strawberry jelly and when nearly set half-fill a mould with it. When this has quite set add a narrower layer of stiff, almond flavoured cornflower blancmange. Spread a little jam thinly over this, and add another layer of blancmange, coloured green and flavoured vanilla. Herring Roes, baked. Fry 3 or 4 soft roes lightly in butter, lay in greased pie-dish with 2 tablespoonfuls chopped mushrooms, of chopped parsley, and 2 chopped shallots. Bone and fillet 3 anchovies, add these with squeeze of lemon-juice and season well. Pour the butter used in frying over the roes and cover with brown sauce. Put greased paper over dish and bake for 5 min.

Its botanical name is Daboecia polifolia. *See* Heath.

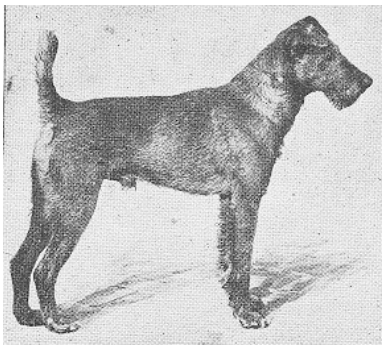
IRISH JIG. Each of the 9 steps in the Irish jig takes 8 bars, and with repeats 16 bars. It may or may not be danced with a partner. The jig step starts by striking one foot against the back of the other leg while turning in a circle, this being repeated seven times, finishing by stamping twice with each foot. A shuffle is done in the next-step, first with the right foot and then with the left, and repeated. The dancer next steps to one side and hops, while striking one foot against the other leg, finishing with a double shuffle. Other movements include turning in a circle while carrying one leg raised in front, and tapping one foot against the heel of the other, finishing with the single shuffle and stamping of the feet. The last step is similar to the second, but brisker at the finish. A shillelagh is often carried.

IRISH MOSS. Irish or Carrageen moss is best known as a remedy for chest complaints, but it also possesses certain nutritive properties. It should be washed thoroughly and should be soaked for several hours before being cooked. It is usually taken as a drink, which is prepared by simmering ½ oz. of moss in a quart of cold water for about 4 hours. Then strain the liquor, sweeten it to taste, and, if liked, add a little lemon juice.

Irish moss is used as a substitute for isinglass in blancmange and jellies, and is also employed in making sizing and lager beer.

IRISH STEW. This popular dish is very cheaply and easily made. Cut 1 lb. neck of mutton into chops, and put it, with 1 lb. sliced onions and ½ pint water or stock, into a stewpan or casserole, and simmer it for about 1 hour.

Then add 1½ lb. potatoes, whole, if small, or cut into thick slices, and salt to taste. Continue to simmer the stew for about an hour, when it will be ready to serve. If cooked in a casserole three hours should be allowed in all, and the stew should be served in the casserole.

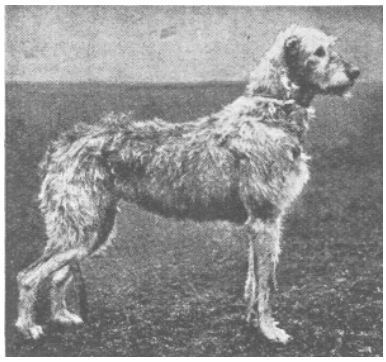


Irish Terrier. Prize-winning specimen of a favourite breed of house dog.

IRISH TERRIER. This rough-coated dog is most devoted to his own people, and can be trusted fully with the care of little children, whose exigent demands upon his attention are not resented. He should be wholly of some tint of red, save for a black nose, and, perhaps, a spot of white on the deep chest; the head should be long and square-looking, carried on a fairly long neck, which broadens to the shoulders and the straight back.

The small, intelligent eyes are of a dark hazel colour; and the small V-shaped ears fall forward to the cheeks. He wears a thin beard. The hard, wiry coat is straight and flat, and, in spite of its length, neither shaggy nor curled. He is smaller than the Airedale, and his weight should not exceed 27 lb. *See* Dog; Terrier.

IRISH WOLFHOUND. The Irish hound attains a greater stature than any other dog, some having been exhibited that measured 37 in. at the shoulder. Assuming that Oliver Goldsmith measured to the top of the skull instead of to the shoulder, as we do, he may have been right in putting the height at 4 ft.



Irish Wolfhound, the largest breed of sporting dog, much valued as a guard.

The Irish wolfhound is powerful and active, with a wiry coat, similar in colour to that of the deerhound. The few breeders find a steady and remunerative market in the United States and the Dominions, the dog being prized as a guard or for hunting wild animals, his size and strength making him incomparable. *See* Dog.

IRON: General Uses. Iron in its simplest form is known as wrought iron, and is obtainable in large sheets, strips, round, squared, and flat strips, or bars, angle irons, or "L" shaped section bars, and similarly in "T" shaped and other various sections. Thin strip iron is used for packing-cases, being known as hoop iron, and also used in a similar way for securing the staves of a barrel.

Wrought iron can be welded or brazed without difficulty, and in addition can be drilled, or cut with a hack saw. It is inferior to steel, both as regards strength and the ease with which it can be turned in a lathe.

Iron, when melted and poured into a mould, is moulded to most intricate shapes, and is then known as cast iron, being used in this form in the making of innumerable articles, but, as it necessitates a high temperature to melt it, the process of making iron castings is scarcely practicable to the amateur. *See* Bent Iron Work; Casting; Forging; Soldering; Steel, etc.

IRON: Medicinal Uses. In the maintenance of health iron is of the greatest importance. It occurs in haemoglobin, the red colouring matter of the blood, which is necessary to the carriage of oxygen throughout the body. In order to maintain the stock of haemoglobin iron must be taken in food, the largest quantities being found in yolk of egg, red meat, oatmeal, and spinach.

It is, therefore, in anaemia that the administration of

iron preparations is obviously necessary. In debility such as follows acute diseases, or resulting from overwork or strain, or in chronic diseases such as tuberculosis, iron may be given with happy results.

The astringent preparations of iron, the perchloride and the sulphate, are used to arrest bleeding. When taken internally they may upset the digestion, produce constipation, headache, and irritability of the bladder. To avoid this they may be combined with purgatives, e.g. magnesium sulphate, or, if necessary, a change may be made to a blander form, such as the citrate of iron and quinine, or of ammonium. Iron also tends to blacken the teeth, and the astringent forms may injure them. For this reason it is a good thing to suck liquid iron mixture through a glass tube.

Among the most popular and widely used preparations of iron for its tonic effect are Blaud's pills, the scale preparations, and Easton's syrup. A course of any of these preparations following on convalescence after any illness or when in a generally run-down state frequently gives most gratifying results.

Iron may also be taken in natural iron waters, such as are found at the chalybeate springs at Tunbridge Wells, Harrogate, and other places.

IRONS AND IRONING IN THE HOME

Describing Electric, Gas-heated, and other Types

For related information on this subject the reader is referred to the article on Laundry. The entries on Box Iron; Clothes Line; Copper; Gas; Goffering; Labour Saving; Mangle; Pressing, should also be consulted.

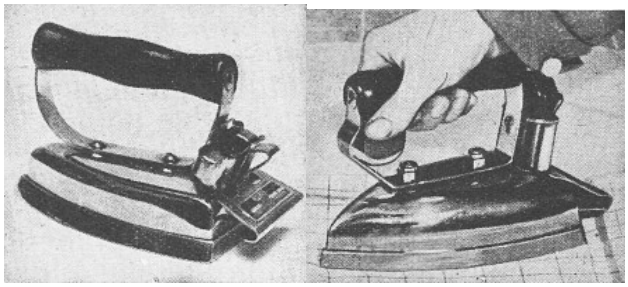
The irons in general use include the flat iron, the iron heated by gas, and the one heated by electricity; but there are also other varieties, such as the fuel-charged box, the spirit iron, and special goffering and polishing iron.

Flat irons weigh, as a rule, from 2 to 8 lb., the heaviest being used for pressing such materials as tweeds. For ordinary purposes, sizes 5, 6, and 7 are the most useful, though it should be remembered that the larger and heavier the iron the longer it will retain the heat.

Flat irons may be heated over a gas ring, on top of a stove, or before an open fire. In the last case the iron is placed in an upright position against the bars of the grate. Irons should never be put on the fire itself, for this tends to blacken them and also, to destroy their smooth surface. Special stoves for heating irons can also be obtained, but these are not necessary unless a great deal of laundering is done. But, whatever the method of heating used, an iron slipper or shield should be fastened on immediately before ironing to prevent the clothes from becoming soiled. When this is not done, the iron will require careful cleaning by rubbing it on a thick sheet of brown paper nailed to a board or table and sprinkled with powdered bathbrick. A little beeswax may then be applied with a soft cloth, and the iron finally polished and dusted.

The heat of an iron may be tested by dipping the finger into water and then dabbing it lightly on the surface of the iron. If the water dries immediately and leaves no mark, the iron is hot. Old pieces of cloth may also be used for testing. During ironing a stand or trivet should be placed on the table so that the iron may rest upon it when not in use. This will prevent unnecessary scorching of the ironing cloth. An iron holder, thick enough to prevent the heat of the handle penetrating through, must also be provided. Irons should be put away in a dry place, for damp rusts them.

The gas iron has a tube attachment which connects it with the burner and a tap for regula-ting the heat. The electric iron is commonly used where electricity is installed, and is heated by attaching the connexion to the wall plug or electrolier, having made sure by examining the number on the bulb that the voltage of the iron and that of the house supply agree. These irons are sold usually in 4 or 5 lb. weights, and have their own particular stands. The current should be turned off when the iron is sufficiently hot and turned on again as required. The electric iron is the cleanest of all.



Iron. Left, adjustable voltage iron for use during holidays or travelling. Right, electric iron which concentrates additional heat in the point. (Courtesy of Hotpoint Electric Appliance Co., Ltd.; and of Edison Swan Electric Co., Ltd.)

To the traveller the adjustable voltage is a real boon, owing to the widely varying supply voltages to be found in different towns. Another useful iron has an automatic device for controlling the temperature by cutting off the current when this exceeds the correct heat for efficient ironing. In that illustrated on the right heat can be concentrated in the point for pressing pleats and small work.

The charcoal and the methylated spirit irons, which the electric and gas irons have done much to supplant, find votaries amongst people who have neither current nor gas in their homes. The charcoal iron has a cavity in which lumps of hot charcoal are placed, and the outfit includes a small pair of tongs for dealing with the fuel. Goffering irons should never be placed in the fire, but may be heated under a flat iron on an ordinary stove. Tailors' irons are long and narrow, and are usually heated by gas or electricity.

Ironing. The old rules still obtain with regard to the ironing of various materials and garments. Piqué must always be ironed upon the back, and when ironing

embroideries upon sheets and pillow-slips, mats, children's dresses, etc., the embroidery should be placed face downward on a thickness of flannel and be ironed in that position upon the back while they are damp. This raises the design. Coloured silks or wool embroideries should also be ironed on the wrong side when nearly dry after having been washed.

Iron shantung, Japanese, tussore, and pongée silk on the wrong side when dry, and use the iron only moderately hot. Any white silk ironed with a hot iron is turned a yellow tint. Other silks and satin ribbons should be ironed on the wrong side when just damp, which they will be if they have been rolled in a Turkish towel and squeezed out after their last rinsing. Cretonne also must be ironed on the wrong side when damp.

Crêpe-de-Chine, crêpe, georgette, and the cotton crepons, after a right-side ironing when damp with a hot iron, usually come out beautifully. A gloss is given to knitted and crocheted silk if ironed on the wrong side when damp with a moderately hot iron. Silk stock-ings should, therefore, not be ironed if required to keep a dull surface. Artificial silk garments should be ironed with only moderate heat. It is advisable always to test the iron before use on a piece of material, or hold it to the face, not near enough to scorch the skin, or wet the iron and listen for the fizzle that indicates considerable heat.

Children's cambric frocks and other garments should be ironed damp on the right side, and to prevent scorching a damp cloth may, for the first ironing, be placed between the material and the iron. Keep all frills that have been set in pleats carefully ironed to their original state. Use goffering tongs for the narrow lace edgings and frills of clothes and bed linen. Lace collars should be ironed lightly on the wrong side with a cool iron, and there should be a piece of muslin between the iron and the lace. Then iron again without the muslin, having previously pulled the edges into shape. Finally pull out with the fingers any raised flower petals, and so forth, that there may be in the design.

When ironing a pleated garment tack the pleats in place or iron them carefully two at a time, placing a damp cloth between the material and the iron. Pressure and a very hot iron will probably be necessary.

Men's linen collars of the turned-over type and the straight are ironed flat, first on the back and then in front. Some men like their turn-over collars glazed both back and front, in order that the tie may slip easily between the folds. They have preferences, too, in the case of the shirt collar-band, some calling for a stiffened band and others a soft one, for which reason the laundries have a plan of using coloured threads that denote exactly the fancies of their customers.

To keep irons polished and clean is an absolute necessity, and the ironing board cover should be washed, especially if iron-moulded, for this mark is catching and can be communicated by the iron to a fresh fabric.

Ironing Board. A board can be prepared for ironing purposes by taking a smooth piece of wood 3 or 4 ft. long and about 9 in. wide and covering it with blanket or felt. This material must be stretched tightly enough to produce a smooth surface, and over it a length of white linen or cotton material should be pinned when ironing takes place.

A specially shaped board of this kind is used for ironing skirts, petticoats, and frocks. It should be narrower at one end than at the other, so that the garment can be fitted over it. Other boards shaped so as to facilitate the ironing of sleeves and shirt fronts are covered in the same way.

Ironing Cloth. The blanket and sheet used to cover a table while ironing is in progress are together known as an ironing cloth. They may be of one, two, or more thicknesses, but the main point is to see that they are perfectly smooth and free from creases. If preferred, a piece of felt may be used instead of the blanket. The sheet must be white, otherwise there will be a danger of damp clothes ironed on it taking the dye.

Ironmould. This is a stain produced by ink or rusty iron. It can be removed from most materials by means of powdered oxalic acid or some salts of lemon and hot water, but if either of these acids is used, the article so treated must be washed immediately afterwards to prevent the acid from causing holes. Salts of lemon may be applied two or even three times on strong white materials, but oxalic acid needs to be used more sparingly.

If salts of lemon is used on coloured materials it should be made into a fairly weak solution with hot water, and the affected part only dipped into it and taken out again before the colour begins to fade. Then put the material into a basin of cold water to stop the bleaching action of the salts and the stain should have disappeared. This process may be repeated, if necessary, but it must be done rapidly and the cold water used afterwards on each occasion.

IRONSTONE. This is an impure iron ore with a heavy proportion of clay. In districts where it can easily be obtained, it may be used for decorative purposes in the garden. It is also used in the pottery industry for the manufacture of some classes of cooking utensils and earthenware.

ISINGLASS. The purest kind of gelatine is known as isinglass. Colourless and without smell, it melts quickly in hot water and is used mainly for jelly making, etc. It is often adulterated with ordinary gelatine, and may be tested by dropping some of it into cold water or vinegar. In cold water, isinglass becomes white and cloudy, while gelatine remains clear; in vinegar it swells and becomes jelly-like, while gelatine hardens.

An invalid dish made from isinglass is prepared by dissolving an ounce of isinglass in ½ pint hot

water, and adding ½ gill white wine and the juice of a lemon. Sweeten all to taste; then add the beaten yolks of 3 eggs, and thicken the whole over the fire. Pour it into a basin, and when cool, but not set, turn into a mould. *See* Gelatine; Invalid Cookery.

ISLE OF WIGHT DISEASE. This malady of bees, prevalent for more than 20 years in Britain, has been found to include several parasitic diseases. The name is therefore obsolete. The bees lose their power of flight, gradually or suddenly, and the use of one or more pairs of legs. Sometimes they are very vicious and use their stings freely, but at other times they are quite the opposite. The combs may be soiled with excrement.

Bee-keepers who notice any of these symptoms, or indeed any general indication that their bees are disinclined to work, should at once examine their stocks and if they have any doubts should consult an expert or communicate with the Ministry of Agriculture.

No certain remedy has been discovered for this disease, but in Bulletin 9 the Ministry of Agriculture and Fisheries gives a few suggestions for preventing its spread and mitigating its severity when it appears. Cleanliness is of great importance in this connexion.

After an outbreak of disease, the inside of the brood chamber and the floor board of all movable comb hives should be charred with a painter's lamp. All skeps, quilts, combs and honey that have come in contact with the affected colony should be burnt, together with all dead bees, and the soil round the hive should be sprinkled with petrol and ignited. After the fire has subsided the ground should be dug over and covered with quicklime.

Bee-keepers should endeavour to see that no stagnant water is left in the neighbourhood of their apiaries, especially when there is any disease in the neighbourhood, and should endeavour to supply their bees with a pure supply at a short distance from the hive. The drinking fountain should have a sheltering board about one foot above it to prevent the flying bees from soiling the water with excreta which they void when on wing. In the spring very thin syrup could be given in the ordinary feeders, as this lessens the demand for water. Some authorities advise supplying them with salt water, especially in the spring.

Bee-keepers who live in districts which are free from disease should on no account purchase swarms or driven bees from an infected district. There is no surer way of spreading disease than to transfer bees from one district to another, for swarms, even from apparently healthy stocks, sometimes develop disease when placed in new hives. *See* Bee.

I SPY. This outdoor game is a variant of hide and seek. The player chosen to be the spy stands with closed eyes at the place fixed upon for the goal, while the others scatter and hide. He counts up to 100 or some other agreed figure and then starts upon the chase, going warily lest a player should dart out and reach the goal before him. As soon as he catches sight of a player, he must shout his name, run back and touch the goal.

The player who has been seen, however, has also this right, and if he touches the goal first he is not caught. The other players can also run for the goal, but if they are seen and named the spy may be able to get there before them. If the spy calls out a wrong name, the player wrongly named and also the one whose name was actually called are both free to return to the goal.

A game ends when all the players are caught, or all have succeeded in reaching the goal. In some parts of England this game is known as lurky and there are other localized names for it in various parts of the country.

ITALIAN CREAM. To make this sweet, prepare a custard with a pint of milk, the yolks of 3 eggs, and sugar to taste, flavouring it with the thinly peeled rind of a lemon and a little cinnamon. Stir in ¾ oz. gelatine previously dissolved in a little water and a dessert-spoonful of strained lemon juice. Let the whole stand until it cools and begins to set; then add the stiffly beaten whites and put the mixture into a mould rinsed with cold water. When firm, it may be turned out and served with stewed fruit made into a puree.

ITALIAN GARDEN. Although there are examples of this style of gardening to be found in England, its principle of subservience to architecture is too pronounced for English tastes. The free and natural growth of plants, which nowadays is such a feature of British gardens, is absent; the stately Italian garden, is distinguished by stereotyped beds of glowing flowers and ornamental plants, balustrades and statuary.

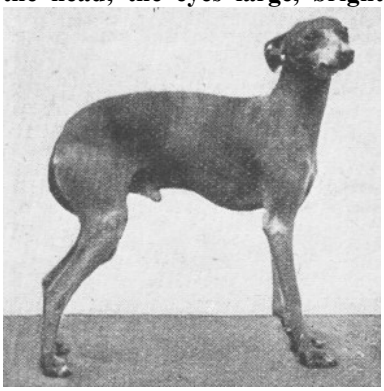
The design is formal, with carefully ordered beds laid out in geometrical shapes. Paths intersecting the beds are paved with stone, or loosely gravelled. Effort must be made to maintain a succession of the most brilliant flowers from spring to autumn, but difference of climate makes it almost impossible to grow many of the striking trees and plants prominent in the gardens of Italy.

Agaves, yuccas, aralias, and dracaenas can be brought into the scheme during summer months, together with specimens of topiarian art. Sculpture, in the form of an ancient wellhead or Venetian cistern, a fountain or stone seat, if possible, should find a place.

Modern gardening regards the plants as of most interest, but old Italian gardens were designed as an ornamental extension of the architecture of the house. *See* Loggia.

ITALIAN GREYHOUND. This miniature edition of the English greyhound has the appearance of great delicacy and fragility, and in consequence has been treated by its owners too often as one of the expensive pets of the drawing room. Gentle and affectionate, of exquisite form and beautiful colour, some shade of fawn, he should be given proper opportunity for exercise.

The head should be long, flat, and narrow, tapering to the fine muzzle and dark nose, set upon a long and gracefully arched neck and long, sloping shoulders; back curved to the hind quarters and the long tail; fore-legs straight with small bones; feet long and hare-like. The small, soft ears should come close together behind the head; the eyes large, bright, and expressive. For show purposes there are two classes: those under 8 lb. in weight and those of heavier build. *See* Dog.



Italian Greyhound. Prince Ivanovitch, a champion of the breed of strong but fragile-looking dog.

ITALIAN

LINING. Available in many qualities and in colours to tone with all the materials ordinarily used in tailored clothing, Italian lining is smooth-faced, and is the chief lining used for men's coats and waistcoats. The best qualities have a strong cotton warp, hidden on the surface by a close texture of fine Botany wool, which lends warmth to the garment. In poorer qualities less wool is used, and in the larger part of Italian cloths there is no wool at all.

Cotton Italians vary in weight from light to heavy, and can be had with guarantees as to the fastness of the colour and permanence of the lustrous finish. Linings tend to polish themselves in wear, and too much insistence should not be made upon their original brightness. A high and permanent lustre is often obtained by methods which rob the cloth of its natural strength.

ITALIAN RENAISSANCE WORK

Modern Simplified Form of an Interesting Old Handicraft

The articles on Gesso Work and Lacquer Work should be consulted in connexion with this, as there are points of resemblance in methods and materials employed. See also Lampshade; Leather Work; Papier Mâché; Stencilling

The original method of applying this ornamental craft was a long one and entailed great skill and patience. It was largely employed in the interior decoration of churches and other buildings and many famous examples are to be seen in Italy. As with gesso work, a paste is employed, and this was used thickly, layer upon layer, and when hard the design was carved out and gilded or coloured. In this article the work is only dealt with from the point of view of the amateur, for the decoration of small articles, but in its antique form it enriched large surfaces.

It is not practicable on metal or glass, but can be used on wood, papier mâché, and even cardboard. As the paste fills in cracks and dents it is an excellent method for re-decorating a wooden box or blotter, or for book ends which have become shabby. It is also largely used for decorating white wood articles, which are obtainable in great variety in most good art departments, together with the materials required for this work.

If the article to be decorated is old it should first be thoroughly cleansed with soap and water and dried. A wooden surface, if smooth, may be sandpapered quickly and just sufficiently to roughen it. A coarse sandpaper should be used, or the surface may be scratched up with a pointed instrument.

Method and Materials. A small box is a simple article to begin experiments with in this craft, which is an ideal one for quickly making decorative objects for a bazaar stall at little cost. A special form of paste, called renasco paste, is employed for the raised decora-tion. It is easier to apply than barbola paste, which requires expert modelling to obtain good results, or than gesso, used for lacquer work, which requires to be exquisitely smooth. Decoration may consist only of the raised paste work done in conventional scrolls all over the article with a spoon-shaped modelling tool supplied with an outfit. Practice is required, but the work in its simple modern form is especially suited to those who cannot draw or paint.

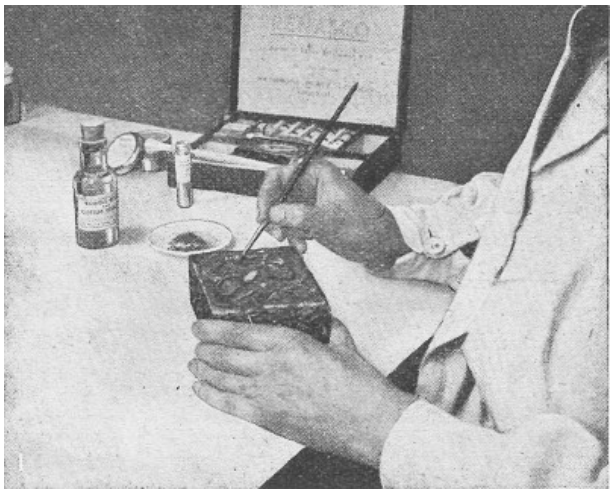
More effective work is done by utilizing a panel as shown in the examples of finished work in Figs. 3, 4. Such panels may be original designs drawn and painted by the worker, in which case the craft may be raised to the standard of an art, or a picture may be cut out and glued to the article and coloured with barbola colours. Photographs and picture postcards can be used and tinted with transparent oil colours. The panel on the blotter in Fig. 4 is a photograph of a well-known picture, those on the tea caddy in the same illustration were cut out from a painting book.

The materials required besides the paste are tubes of vandyke brown, emerald green oil colours, yellow, blue, crimson and mauve barbola colours, a special medium and turpentine, gold and silver bronze powders, a sable, a fitch and a hog hair brush, one or two modelling tools, china saucers for mixing colours, and other bronze powders and oil colours which may be needed for a particular piece of work, and are obtainable separately. Metal glue is the best adhesive for sticking on panels and strips of cardboard which may be utilized to form a raised framework round the panel and should be affixed before the renasco paste is applied. Such a framework has been used to surround the photograph panel on the blotter.

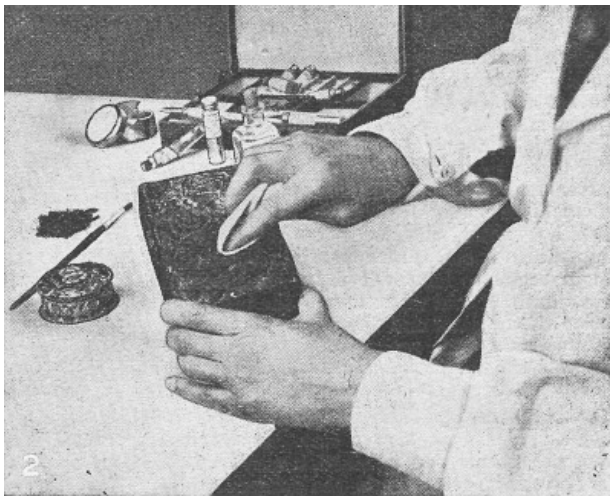
To decorate one of the boxes illustrated in Fig. 3, the space which the panel will fill must first be decided on and then the design must be drawn, traced, or the photograph, card or picture must be glued into place. Where it has been decided to decorate this panel design with barbola colours, portions of the design, trees, birds or figures can be slightly raised with the paste

reduced with water to the consistency of a thin cream, and allowing it to dry before applying any colour. The actual painting of the panel is left until the remainder of the decoration of the box is finished. While the panel is drying the rest of the box is covered with the paste, using a hog hair brush. Apply the paste unevenly, covering any strips of cardboard or of wood which may have been glued or nailed into position round the panel. The paste should not be allowed to spread on to the latter.

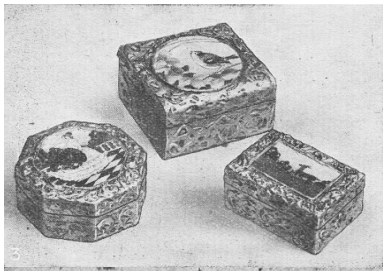
This first coating of paste is left to set for twelve hours, unless the weather is very damp, when it may take longer. For the second coat the paste is used of a consistency which, when the brush is raised, flows from it in sufficient thickness to make coils. Only the paste is allowed to touch the surface of the first coating, not the brush, which is kept moving in circles, figure eights, or leaflike formations to cover the box with raised decoration. The scroll work design on the right-hand box of Fig. 3 is done with a spoon-shaped modelling tool instead of the brush.



Italian Renaissance Work. Fig. 1. Above, gilding the paste; a squirrel brush is used and the gold powder is mixed with renasco medium. Fig. 2. Below, removing excess of oil colour with a clean rag. (Courtesy of Winsor & Newton. Ltd.)



Gilding and Colouring. When the second coating of the paste is dry, the whole article, except the portion reserved for the panel, is gilded and coloured. A squirrel hair brush is best used for this purpose. Gold bronze mixed with the special medium is painted over the paste (Fig. 1); when this gilding is dry it is in turn painted over with vandyke brown oil colour thinned with turpentine. This is allowed to dry for a short time and then with a piece of clean rag the colour is reduced in places to give an antique look (Fig. 2). A greenish shade may be obtained by mixing emerald green oil colour with the vandyke brown.



Italian Renaissance Work. Fig. 3. Above, three boxes showing raised designs coloured in barbola colours.



Fig. 4. Below, blotter and box. (Courtesy of Winsor & Newton. Ltd.)

By the time all this has been done, the raised portion of the panel design will be quite dry. Barbola colours look well on this work as they are somewhat suggestive of the old tempera colours used for this form of decoration in the time of the renaissance. Sable brushes are best for painting and water for thinning. As little shading as possible should be used, the colour being applied, except for details, in flat washes. When raising, the paste should be used more thinly than for the rest of the decoration. Gesso powder is quite suitable for this purpose as applied to the handkerchief box described previously. The object in the first case is to provide a smooth surface in very slight relief; in the second, a rough surface in bolder relief. For raising the panel design use a sable brush and twist it to avoid brush marks and to make the paste lie correctly. Instead of cardboard strips the framework-round the panel can be formed by drawing the paste along and turning the brush while working. It is important to remove or raise the lids of boxes before applying paste.

The edges can be trimmed with a sharp penknife when the paste is dry.

Candlesticks and wooden table lamps can be successfully decorated in this method. On the white wood blotter and tea caddy illustrated in Fig. 4 the panel pictures are merely coloured and no raising paste has been applied to them. After glueing on the panels a rubber roller should be employed in order to remove any bubbles which spoil the appearance of the work.

For the blotter thin strips of cardboard are glued

round the panel to form the frame and the back of the blotter is gilded all over. Paste is not used for this as the back is required to lie flat on the table. A pretty effect is gained by mixing silver with the gold bronze powder for painting the paste and introducing a little vermilion and vandyke brown oil colours, wiping the latter off, as shown in Fig. 2, so that the metallic lustre is not lost. When the paste work on the front is painted, the photograph is coloured with transparent oil colours, using megilp as the medium for this decoration.

The white wood tea caddy is decorated with five pictures cut to fit sides and top. When these are firmly glued to the wood the box is covered with the paste. Opening the lid, do the sides first and the top last. Bronze powders are used to colour the paste, a good effect being gained with copper instead of gold, the brown oil colour being left only in the unraised portions. If picture postcards are used to decorate the box, they must be tinted with oil colours; if drawings or cutout line illustrations, these can be worked up with barbola colours.

Many of the materials in the various handicrafts to which the reader is referred can be utilized to make variety of designs and colourings when the worker gains experience, and in this way original pieces are produced. Barbola work, for instance, in a floral design could be used instead of a panel, or for an edging on a box decorated with renaissance work. Stencils can be employed when painting small panels at the base of candlesticks covered elsewhere with relief work.

ITCHING. Itching of the skin, or pruritus, may be transient and easily controlled, but it is sometimes so severe and continuous as seriously to affect the general health. It accompanies many skin diseases. It may also be the result of irritation by fleas, lice, scabies, or by coarse woollen underclothes. In nettle-rash or hives, often found in indigestion, the chief symptom is intense itching.

Where the sensation is localized, bathing the part with a one in forty solution of carbolic acid sometimes gives relief. Another useful lotion for sopping on the skin to relieve localized itching is the following:

Carbolic acid	1 dram
Bismuth carbonate	1 „
Rectified spirits of wine	2 oz.
Water, enough to make	8 „

Make into a lotion, sop on to the itching skin, and allow to dry. These lotions are poisonous if taken internally.

General pruritus without apparent cause may be benefited by Turkish baths (if the doctor approves) or hot baths, and to the latter might be added bran or oatmeal, 2 lb., or carbonate of soda, 2 oz., to the 30 gallons. *See* Scabies.

IVORY. There are four kinds of ivory: Indian, African, walrus, and mammoth, and to the experienced eye each has its distinguishing features. Indian ivory is recognized by its intense whiteness, also its small size, and by its very slight graining. African ivory is the choicest and commands a considerably higher price. The tusks of the African ivory grow to a very large size. The graining is much more pronounced than in the Indian, whilst the colour is a rich light cream. A variety of the African known as soft ivory is much paler in colour than the choicest African ivory, but it has a very similar graining.

Mammoth ivory is mostly found in Siberia, and is obtained from the remains of prehistoric animals. It has not a great commercial value, and is largely used for making the cheaper varieties of ivory ornaments, bead necklets, etc. The colour is very white, and the tusks, when found, are mostly damaged and cracked; when exposed to the light it cracks on account of its dryness. Ivory from walrus tusks is similar in appearance to mammoth ivory.

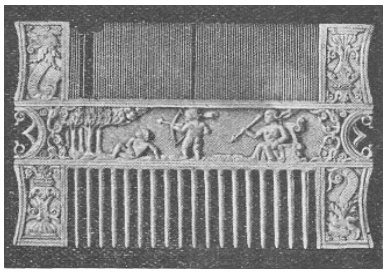
Ivory articles that become discoloured should always be placed in expert hands, as it is impossible for ivory to be cleaned without damage except by those who are accustomed to handle it. Any slight discoloration can be removed by wiping the ivory with soft wool or rag moistened with hydrogen peroxide and placing it in the sun, which will whiten it. On no account should ivory be washed with soap and water. Some ivory has dark yellow or brown markings. These are mostly found on small beads, and are the result of too much bark being left on the ivory; the dark colour can be bleached by wiping it with wool slightly moistened with hydrogen peroxide.

Ivory is mostly used in European countries for the manufacture of piano keys, billiard balls, knife handles, brush and mirror backs, combs, powder boxes, silk bag frames, and, when in fashion, bead necklets. The most popular of these ornaments are undoubtedly the round and oval bead necklets, which are made of best West African ivory. The best beads are made from the points of the tusks; they have pronounced graining and are cream in colour. Bangles are made in ivory with inlaid gold. They are often engraved with Chinese and Indian figures, and carved with floral and other designs.

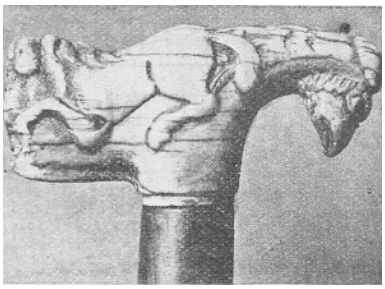
Articles made of walrus or vegetable ivory are inferior in quality and appearance. Vegetable ivory is chiefly used for buttons, and although it is generally described as ivory, the material actually is cut from a nut, the nut ivory button industry being quite large in certain Italian manufacturing districts. These articles of nut ivory are easily distinguished by their whiteness and almost bone-like colour, and the absence of graining such as is seen in tusk ivory. The walrus ivory is mostly obtained from the tusks of the Baltic sea lions, and as these are small the chief use for this ivory is in making bead necklets and other small articles. It is more fragile than elephant ivory; also it has not the lustre, and it cracks very easily. It is usual for it to be bleached, and the chemical action frequently causes cracks to appear.

It is advisable when purchasing ivory goods of any description to inquire whether the ivory is elephant,

walrus, or mammoth. The last two are comparatively cheap. From the description given above it should be possible to distinguish the fine qualities from the less expensive.



Carved ivory comb of Italian workmanship of the 14th or 15th century. (National Museum, Florence)



Ivory. Walrus ivory tau-head fixed to the top of a walking-stick. Northern Europe, 12th century. (By permission of the Director, Victoria & Albert Museum, S. Kensington)

If ivory is to be silvered, put it into a weak solution of nitrate of silver and leave it there until it has acquired a deep yellow colour. Then wash it with water and expose it to sun for about three hours, or until it turns black. Vigorous rubbing will then produce the desired silvery effect. Preparations, together with directions for staining ivory red, blue, green purple, yellow, and other colours can be obtained from most chemists.

Antique and Decorative Pieces, For the purpose of home decoration the classes of ivory carvings most readily available are statuettes, plaques and caskets. The first include works of great excellence produced by modern artists more freely in Belgium and France than in England. In some instances they are set off by other materials, such as metal, ebony and gems. Some of the antique Chinese statuettes are highly valued by collectors and are of great beauty. Plaques and caskets are usually carved in low relief. A fine example of such carving on ivory is seen in the illustration of the mirror case.



Ivory. Carved ivory mirror-case depicting a hawking scene. French, 14th century. (British Museum)

In acquiring old ivories it is essential to avoid anything not pleasing in itself. Admirable work has been done in all ages in walrus ivory and in the horns and bones of various animals. Some of the choicest pieces of antique ivory, especially the Romanesque, Byzantine, and medieval diptychs, or folded tablets, have been reproduced in waxed plaster-casts called fictile ivories. For purposes of art study they are quite desirable.

A large industry in modern carvings has developed in India, China, and Japan for the Western market. They are often tawdry and lacking in attractiveness, because they do not interpret native feeling.



Ivory carvings which retain the mellowness of age should not be washed, but polished with soft leather. A bath of turpentine, followed by exposure to sunlight for a few days, is sometimes advantageous and quite harmless. Some forms of artificial discoloration can be detected by applying a damp cloth. Old specimens should be kept under glass, away from the sun.

Ivory. Chinese statuette, 17th century. (Victoria & Albert Museum, S. Kensington)

IVY. The common ivy (Hedera helix) is an invaluable evergreen shrub of climbing or trailing growth, it is one of comparatively few self-clinging climbing plants and is thus often used for the purpose of covering walls. If planted in such a position it should be cut hard back annually in April to get rid of the old leaves and straggling shoots. Ivy thrives in ordinary soil and is propagated by cuttings set in a frame in August or out of doors in October.

The variegated ivies are more attractive than the common green-leaved form: a few of the best are Crippsii, Lee's Silver and variegata elegantissima. The golden-leaved ivies too are favourites, and there are some distinct varieties among the small-leaved ivies, such as Caenwoodiana, crenata and gracilis. Some of the best large-leaved ivies are canariensis (Irish ivy), dentata and amurensis. The leaves of purpurea are green in summer but take on a purplish tint in autumn.

A curious trait of ivy is that as soon as it reaches the top of its support it loses its climbing or trailing form of growth and becomes what is called a tree ivy. It develops a bushy habit of growth and bears flowers and fruits. Ivy makes a good ground covering beneath trees and in very shady places where little else will grow.

IVY LEAVED GERANIUM. The type of pelargonium known as the ivy-leaved geranium is useful in the garden in summer flower beds and in vases. It is valuable for covering greenhouse walls, for hanging baskets under glass, for window boxes and balconies.

Propagation is by cuttings taken in August and kept under glass until spring, when they are transferred singly to 4 in pots, points of main shoots being nipped a few days later to make stocky plants and to ensure prolific flowering. Madame Crousse, pink, and

Souvenir de Charles Turner, carmine rose, are two favourite varieties. *See* Pelargonium.

IXIA. This is a bulb plant which bears flowers of many brilliant colours in early summer. It is not very hardy and should be grown in pots in the greenhouse or be planted in well-drained soil in a sunny sheltered border preferably at the foot of a wall. The bulbs are potted or planted in September: if out of doors they should be covered with 2-3 inches of soil and protected by old ashes in winter. If grown in pots they must be dried off gradually after the flowers are over and re-potted in autumn. The green and black ixia (viridiflora) is very handsome; numerous others named in catalogues have blooms of scarlet, rose, crimson, and yellow. They are propagated by offsets.

IXIOLIRION. This is a rather uncommon bulb plant from Persia which, when grown in British gardens, needs a sunny sheltered place in a well-drained compost of loam, leaf-mould and sand. The bulbs should be set in autumn 1-2 inches deep; a covering of old ashes should be put on the soil early in winter. Pallasii (tataricum) is the only kind usually grown; it bears blue flowers in early summer.



Ixiolirion, or Ixia Lily. Delicate tubular flowers of an uncommon bulb plant.

IXORA. These are beautiful hot-house shrubs, known also as the West Indian jasmine. They form bushes of glossy foliage, surmounted by lovely panicles of flowers, either white, yellow, or red. Ixoras like a compost of two parts of rough loam, one part leaf-mould, and one part fibrous peat, with a good sprinkling of sharp sand.

Propagation is effected by means of cuttings. For this purpose fairly mature shoots which show no signs of bloom should be inserted singly in small pots, in sandy peat, and plunged in a propagator. After the cuttings have been rooted, remove the tops, as this will conduce to a bushy habit. The plants should be potted on until 6 in. pots are reached. After flowering give the plants a rest in a temperature of from 55° to 65° during the autumn and winter months. The time for repotting is when growth is just starting.



Ixora. Flower head and glossy foliage of the beautiful hot-house shrub.

JABORANDI. Dried jaborandi leaves are important in medicine because they contain certain alkaloids, especially pilocarpine. Both jaborandi and pilocarpine are largely used as outward applications to the hair to stimulate and promote its growth. Taken internally, they cause an increased flow of perspiration.

JABOROSA. A hardy perennial plant allied to the mandrake, this is one of those curious freaks of horticulture which are said to shriek when their roots are torn from the ground. Jaborosa grows in any warm soil in a sheltered situation, and has white Lapageria-shaped flowers about 2 in. in length and very fragrant.

The plant rarely attains to a height of over 1 ft., and is propagated by separating its long, creeping stems. It is during this process that the noise called shrieking occurs. *See* Mandrake.

JACINTH. This semi-precious stone is transparent and bright in colour, varying from a dark red to orange. The best stones have a lustre and are pretty, but not valuable.

JACK: For Lifting. A jack, or a lifting jack, is a mechanical device for raising weights or for exerting great pressure. It usually takes the form of a strong metal casting, broad at the base and tapering towards the top. Through its centre passes a rod with a square sectioned screw-thread cut upon it. A steel nut with actuating handle turns upon this rod and rests upon the top of the body of the jack. Consequently, when the nut is rotated the steel rod is forced upward, and the head, or pad piece, which is affixed to it bears against some convenient part of the object to be lifted, thereby forcing it upward.

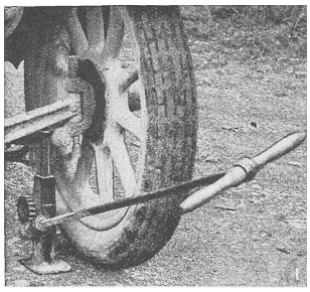
When using a screw jack for lifting operations, it is important to see that the foot of the jack rests upon a solid base; if it is tilted to one side it is liable to slip when the load is brought to bear upon it. Similarly, the head of the jack should bear upon some firm, solid part of the object to be raised, the essential thing being that the pressure is exerted in a straight line.

A jack is very convenient if it is desired to force an object along for a few inches, as the jack can generally be laid in a horizontal position, with the foot bearing upon a solid piece of wood which butts against the wall of the house, or any other sufficiently strong resistant structure.

A convenient type of jack has a worm and wheel to rotate the screw-nut, and this permits of still easier operation of the jack, and, to avoid the necessity of approaching near to the jack, a long extension handle may be employed to rotate the worm, as in Fig. 1.

A lifting jack is an indispensable part of the equipment of the motor car, and there are numerous types. Important points are that the jack be of such size that it can be inserted under the axle when the tire is deflated, that the base is adapted to stand firmly on the ground, and that there be an extension handle. The jack should be capable of lifting the weight of the car

when fully loaded. Vehicles that weigh 1½ tons or so should be provided with a double-lift jack, that is, one in which a separately movable part is provided; this is raised by hand, thus leaving only the car itself to be raised by the jack.



Jack. Fig. 1. Example of a jack in use, showing convenience of the long handle.

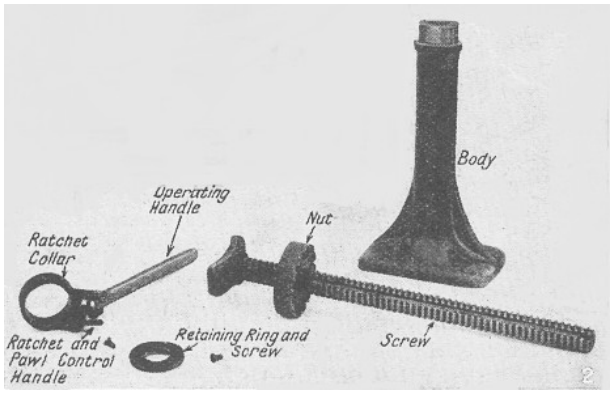


Fig. 2. Component parts of a lifting jack.

For garage use a regular garage type of jack is preferable, as it can be wheeled about from place to place; the base has one or two wheels mounted upon it; the lifting is on the lever principle, and only calls for the depression of a long handle to raise a heavy car, the jack being held in position by a ratchet device.

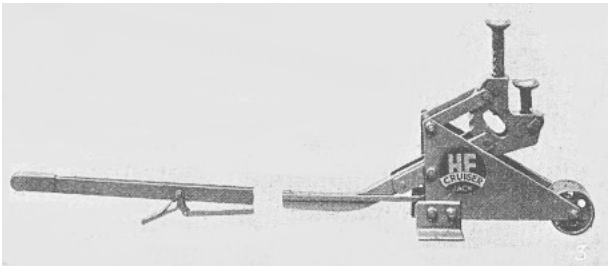


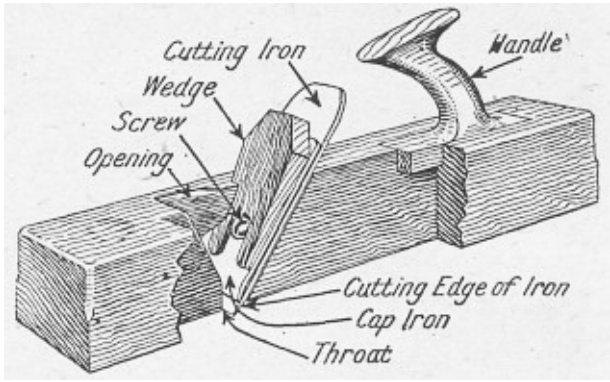
Fig. 3. Self-locking garage jack, operated by a long lever. (Courtesy of Harvey, Frost & Co., Ltd.)

JACKDAW. No bird is more easily tamed than the jackdaw, and once it gains the affections of its owner, it will attach itself firmly to him. It has a strong partiality for bees and beetles, and will devour mice.

The food usually provided for the bird in captivity consists of bread and milk, oats, insects of all kinds, and scraps of meat. The jackdaw may either be kept in a cage, which should be large, or allowed the run of the house. As it has thievish propensities, bright objects, such as rings, brooches, etc., should be kept out of its reach.

JACK PLANE. This name is given to a type of long plane used to prepare the surfaces of timber. It is an indispensable tool for all workers in wood, as by its aid the rough and uneven wood is planed to a true surface.

Jack planes are made in several sizes, varying in width from 2 in. to 2½ in., and from about 14 in. to 15 in. or so in length. Most are made of beech wood. This type of plane is generally sold with an open or single handle, others have a try-plane type of closed handle, another variety has a single handle or horn at the front, but the most usual has the handle at the back, and this type is to be preferred for amateur use. They are to be had with a single or a double iron, the latter being preferable, as it is easier to use.



Jack Plane. Sectional drawing showing construction.

The iron is secured by a wooden wedge, which has to be removed to withdraw the iron for sharpening purposes. This is accomplished by grasping the plane in the left hand with the fingers on the face, and the thumb in the throat pressing on the iron; a blow is then struck on the top front of the plane; this is repeated if necessary, and releases the iron, which is then withdrawn, the two parts separated by unscrewing them, and the cutting iron sharpened on a grindstone in the usual way. The iron is replaced and secured by driving the wedge back into its place with a hammer. *See* Amateur Carpentry; Plane; also illus. Above.

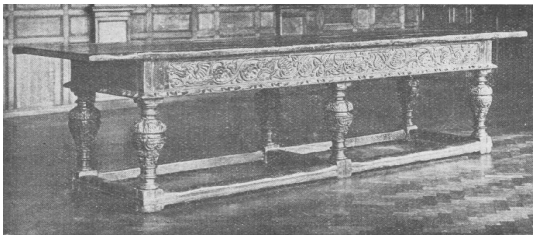
JACOBEAN STYLE IN FURNITURE
The Famous Classical Period of English Oak Pieces

The Jacobean Style is further described under the headings Antique Furniture; Armchair; Chest; Chimney Piece; Door Furniture Grandfather Clock; Grate; Guilloche; Hall; Oak Panelling; Settle, etc. See also the styles preceding and following the Jacobean; Tudor; William and Mary.

The term Jacobean used in reference to decoration and furniture applies to the period between 1603 and 1688 and thus embraces almost the whole of the 17th century. French and Italian influences greatly swayed the taste in British furnishing during the reigns of Charles II and James II, so that the purer forms of English Jacobean style, directly evolved from the Tudor, are to be found in the oak furniture made before 1660.

After the Restoration walnut was used, and by the end of the 17th century, with this new wood, a different style of furniture had come into fashion for the homes of the rich.

The Jacobean period was not distinguished for a great diversity of pieces. Furnishing in a comfortable manner was only beginning to be thought about during the reign of Elizabeth, and the first half of the 17th century saw improved workmanship and more elaborate decoration and carving, but few innovations. Furniture in a wealthy household would include a carved four post bed with bulbous supports and having probably a bedspread and curtains of linen, embroidered with crewel work in one of the conventionalized designs which are to-day reproduced in furnishing fabrics labelled Jacobean style. The dining table might be of the type seen in Fig. 1, with stretcher rails, richly carved frieze and the legs showing the Elizabethan bulbous formation, which continued far into the Jacobean period, or of the draw-leaf type, which had two leaves, one at each end, to draw out from beneath the top, centre leaf, which then dropped to the same level. Many reproductions are still made of this draw-leaf table. The gate-leg table was introduced during the commonwealth, and an early form is illustrated in which the legs show the baluster style of turning; the barley sugar twist was introduced later.



Jacobean Style. Fig. 1. Beautifully carved oak table, dating from the 17th century. The top is fixed and the bulbous legs are supported upon stretcher rails. (By permission of the Director, Victoria & Albert Museum, S. Kensington)

Seats included stools like the one illustrated in Fig. 3, heavy forms, chairs with arms, upholstered sometimes in hide, or having loose velvet cushions, and high-backed benches or settles. A beautiful example of a carved settle is shown in Fig. 4. The monk's bench or table settle was made at this period, a piece with a movable back which is adjustable to form a table and is reproduced for the Jacobean style of hall furnishing to-day.

Chests of the 17th century were often beautifully decorated. Buffets were a development of these set on stands and were the earliest attempts at sideboards. A court cupboard and a livery cupboard would be found in the dining hall of the day, a courting seat, or double armchair, might be seen there towards the end of the Jacobean period. A bible box and a mirror, pillows, tapestries, curtains, and carpets were accessories and amenities which softened the otherwise austerely utilitarian appearance of the wealthiest home.

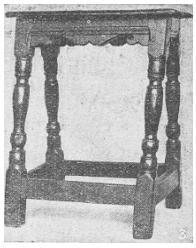
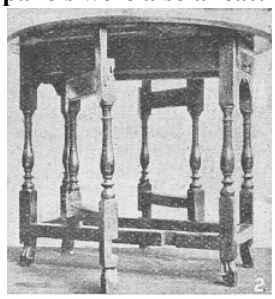




Fig. 3. Oak stool, middle 17th century; height, 1 ft. 10 ¾ in.; length, 1 ft. 6 in.; width, 1 ft. 1 in. Fig. 4. Oak settle with finely carved and panelled back.(Fig. 3 by permission of the Director, Victoria & Albert Museum; Fig. 4 courtesy of Gill & Reigate, Ltd.,)

Panelling was extensively used for interior decoration, and plaster work of great beauty is seen on friezes and ceilings of the period. Examples of rooms can be studied at the Victoria and Albert Museum, South Kensington. The small oak panel of the Jacobean period had sometimes an inlay of coloured wood and the moulding of its frame was often elaborate. Small panels were also a feature of the heavy oak doors.



Jacobean Style. Fig. 2. Oak gate-leg table, 17th century; height 2 ft. 3¾ in.; width, 3 ft. 2½ in. (By permission of the Director, Victoria & Albert Museum)

Inlay and Carving. Jacobean furniture is not cabinet maker's work as now understood. It is the work of a joiner, and is very simply put together. Its main appeal is on account of the decorative treatment, which is distinctive and easily recognized. Where inlay was used it was in geometrical or floral patterns. Sycamore, holly, and box were favourite woods for inlay; and sometimes ivory, bone, and mother of pearl were used on chests and more elaborate pieces. On these and on wall panelling relief carvings are also seen; otherwise carving in the main is incised. Guilloche strap work and arabesque ornament were frequently carved on chests, settles, and buffets. Architectural shapes were given to panels by applied mouldings. Relief carving enriched this style and, where genuine, the piece decorated with it is of great value.

Jacobean styles continued to be made in oak and cheaper woods for the furniture of middle-class homes and farmhouses well into the 18th century, and often where the carving is somewhat crudely incised on a genuine antique this may be found to be a later piece of farmhouse furniture, the decoration having been done by the joiner and not by a carver.

For these commoner pieces perfectly straightforward patterns were incised into the wood by the V-tool and gouge. It was a common custom to sink the ground and leave the pattern flat, with a little relief introduced by gouge and V-tool veinings. Many chests

of the period have a diamond form incised in the width of the panels, and a few gouge cuts put in the corners or centre or on the edges of the rails give a little relief. Frequently a date occurs on a chest or court cupboard, but many plain chests of the Cromwellian period and later have had earlier dates put on, so that it is unwise to take dated furniture at face value. Rails enclosing panelling were not as a rule mitred, and the upper moulding was often scratched on.

Jacobean carving of this type has usually an amateur look. It is common to see furniture of the period carved all over the front—in the case of chests, buffets, and dressers—and only a little plain space left here and there. Welsh settles and chests are seen quite crudely treated in this way, the ornaments being often merely a flat, conventionalized dragon or the acanthus leaf form.

The armchair of the period was a very clumsy article. It consisted of heavily turned legs and arm supports, a square panelled back finished sometimes with a crest rail, and rails connecting the lower part of the legs and occurring immediately beneath the plain, flat, wooden seat. The back sloped back a little, and it was common for ornamentation to be introduced in the form of incised leaf ornamentation and possibly strapwork.

JACOBINIA. This South American tropical plant requires ordinary hothouse treatment. It is propagated by cuttings taken in spring-time, and needs a compost, loam, peat and sand. Two of the finest sorts are chrysostephana, which bears orange yellow blooms in winter and spring, and carnea, with rose coloured flowers later in the year.

JACOB'S LADDER. This hardy herbaceous perennial grows about 18-24 in. high and bears blue or white flowers in summer.

They flourish in ordinary soil and are easily grown. The best are Polemonium caeruleum, blue; alba, white, and himalayanum, blue. The last named sows itself freely. All can be grown from seeds sown out of doors in spring.

JACONET. Plain cottons, usually white but sometimes dyed, jaconets are some 40 in. in width and in pieces of about 20 yd. in length. They are a kind of calico somewhat finer than longcloth and coarser than madapolam, sometimes given a hard finish, but procurable also in a soft finish like nainsook.

JACQUARD. To produce large figured patterns such as are seen upon brocades, damasks, and tapestries, or to weave monograms and lettering into cloths, a special attachment had to be fitted to the loom. This mechanism bears the name of its inventor, and the goods woven are also described as jacquard.

The process is slower than ordinary weaving, making the goods more costly to produce. To obtain a more perfect result cloths are sometimes jacquard-woven although they could be produced upon a less complex machine.

The designs in Brussels and Wilton carpets, damask tablecloths, flowered bath robes and bath mats, are jacquard. In many fabrics jacquard weaving can be detected by the fact that the back and face of the cloth are a perfect replica, but in reversed colourings.

The name has nothing to do with the kind or grade of material, for silk, wool, cotton, and linen may all be woven by this means. Using fine enough thread and a sufficiently elaborate jacquard machine, portraits and coloured pictures can be reproduced quite successfully and faithfully in woven cloth. *See* Loom; Weaving.

JADE. Jade is a very hard mineral, and appears in various shades of green, greenish white, and yellowish grey. Jadeite is brighter in colour.

Large quantities of jade and of its imitations are now used in Europe. It is worn in the form of carved ornaments and beads and is chiefly valued on account of its beautiful colouring. Genuine carved Chinese pieces of good workmanship and colour are, however, intrinsically valuable.

JAM. Jam can be made from many kinds of fruit, although some kinds are more suitable than others. Some fruit, e.g. the apple, goes well when mixed with certain other fruits, but does not itself make good jam.

Dried fruit is sometimes used, but fresh fruit makes a much better article. When jam is made from dried fruit, the fruit must be soaked overnight in water which covers it well, and fruit and liquid boiled together the following day.

The chief fruits used for jam making in Great Britain are raspberries, strawberries, gooseberries, currants (red and black), plums, damsons, and apricots. Rhubarb is used chiefly to mix with other fruit, and apples go well with blackberries. Quinces, pineapples, and cranberries are among the other fruits used. Marrow jam is made, and ginger is also used to flavour other fruits.

For jam the fruit must be sound, and most of it should be rather under-ripe. The jam will not keep or set well if over-ripe fruit is used. A mixture of one-third ripe and two-thirds unripe fruit will produce a jam of good flavour and good setting qualities. Green gooseberries are used. The colour may be intensified with a little green vegetable colouring, or the jam may be reddened with cochineal.

The Process Described. The preparation of the jam depends to some extent upon the kind of fruit used. Gooseberries must be topped and tailed, currants must have their stalks removed, raspberries must be hulled, and so on. All bruises and blemishes must be removed. Some fruits are stoned for jam, but this is not essential, even in plums. All fruit, except soft fruits such as raspberries and strawberries, should be washed in cold water. These should be tossed lightly in a clean towel, to remove any dust. Iron or tin utensils should not be allowed to come in contact with raw fruit. It should be prepared with a silver or stainless

steel knife; stirred with a wooden spoon and boiled in an aluminium or enamel-lined preserving-pan. All fruit should be weighed before boiling.

This done, the fruit should be put into a thoroughly and recently cleaned preserving pan. If it is hard fruit, sufficient water must be added to start the cooking, but if it is soft fruit no water is required. In the former case about a pint of water to 10 lb of fruit is an average quantity, but very under-ripe fruit may require more. As for sugar, white granulated should be used, and from ¾ lb. to 1 Ib, allowed to each pound of fruit. The sugar should be warmed before adding to the fruit. Ripe fruit requires slightly less sugar than unripe. Gooseberry jam, for instance, will require 1 lb. of sugar to each pound of fruit in order to bring out the flavour of the berries. This jam is also an instance of one which requires more water, ½ pint being necessary to each pound of fruit.

The fruit should then be boiled. First stir it over a moderate heat until its texture is broken down. Then add the sugar and stir the fruit until all of it is dissolved. The jam should then be boiled rapidly until it sets when tested. The preserving-pan must be large enough to allow of rapid boiling without fear of the jam boiling over. The jam must be stirred in order to prevent burning. Scum should be removed after the sugar is added.

The jam should be tested frequently by placing a little of it on a cold plate. If, on cooling, the consistency is firm, it has boiled sufficiently. If it is boiled too long it will not set, and it will be syrupy. When it is boiled, pour the jam into heated jars, and place on its surface, while still hot, wax papers, and tie on a cover of parchment paper. Store the jars, when cold, in a cool, dry place.

Some fruits, such as strawberries and some of the sweeter varieties of raspberries, require the addition of a small amount of citric or tartaric acid, or of acid fruit juice, for instance, that of red currant, to produce a jam that will set. An average amount of acid is ½ oz. to every 8 lb. of fruit. It should be dissolved carefully in as small a quantity of water as is possible, and should be mixed thoroughly into the jam before the sugar is added. If acid fruit juice is used, about a pint should be added to every 4 lb. of fruit.

If less than ¾ Ib. of white granulated sugar is used to each Ib. of fruit, or if it is insufficiently boiled, it will not keep, nor if stored in a damp cupboard or in too warm a place.

Although usually made from fresh fruit, jam can also be made from fruit pulp which has itself been made from the fresh fruit. The advantage of this pulp is that it can be kept until it is required for the jam. Apples, plums, damsons, goose berries, and raspberries are especially suitable for pulping. Fruit pulp can be bought from any large store, so that it is possible to make jam all the year round.

Jam Containers. Containers for preserves are obtainable in various sizes to hold 1 lb., 2 lb., 3 lb., or 7 lb.; larger sizes are also made, particularly for the marmalade. These jars or pots are made of glazed earthenware or glass, the latter being preferred by many, partly for its appearance, and also because it enables any trace of mould on the preserve to be detected without removing the cover.

To prevent the jars from cracking while the hot jam is being poured in, make sure they are absolutely dry, and warm them a little beside the stove. Of the various kinds of patent covers used to keep jam jars airtight, the most easily adjusted are those with clips or flanged rims or screw tops. If bladders are used, the jam should first be covered with a round of white paper, the bladder washed in warm water, partly dried, and then stretched across the top of the jar and tied down tightly with string. Parchment paper or greaseproof paper can also be used. Packets of tissues and gummed covers can be bought in various sizes to fit the jars. *See* Blackberry. Gooseberry, etc.

Jamaica Pepper. *See* Allspice.

JAMB. This term is often used in architecture and building construction to describe the side posts of a doorway, the side of a window opening or of a fireplace. The word is better understood if it is remem-bered that, in substance, the door, window frame, or grate is jammed or compressed into the opening of the surrounding brickwork, although the framing may be built into position.

The part of the wall that remains visible after the door frame, for example, has been fitted is known as the reveal, for the reason that the jamb is visible or revealed. The casing around the opening is known as the jamb lining, the upper part as the jamb head.

The decorative treatment of window jambs comprises facing the jambs with thin oak, nicely figured, wax polished, and possibly decorated with applied mouldings. In the case of a thin-walled building, considerable improvement can be effected by extending the jamb linings beyond the wall face and hanging casement curtains in the opening. The jambs in a room treated in a severe style may well be painted or stencilled, a floral design being suitable. *See* Door; Hinge; Window.

JAMESIA. This is a hardy deciduous shrub, allied to the hydrangea. The Jamesia is a native of the Rocky Mountains, and is a member of the saxifrage order. It requires good, well-drained soil, and reaches a height of about 3 ft.



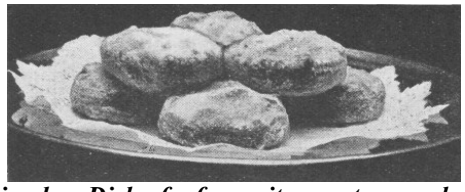
Jamesia. Hardy shrub called after an American botanist. It is allied to the hydrangea, and is very effective grown in a large sunny garden. (Courtesy of Amateur Gardening)

Plant from autumn to spring, and when necessary prune directly after its white flowers have died down. Propagation may be by seed, but the best method is to insert cuttings of ripe wood in sandy soil under a cold frame during autumn.

JAM PUDDING. Some suet pastry and jam of any kind are needed to make the following jam pudding. Use a little of the pastry to line a basin, put in a spoonful of jam and then cover it with a round of pastry. Continue these layers until the basin is full, making the last layer one of pastry. Cover the pudding with a greased paper and steam it for 2½-3 hours.

A baked jam pudding is made by mixing together ¾ lb. of flour, 6 oz. of sugar, a teaspoonful of baking-powder, 6 oz. of finely chopped suet, and the grated rind of one large or two small lemons. Work in gradually 2 well-beaten eggs and ½ pint or more of milk. Have ready a greased pie-dish, and into it put 4 tablespoonfuls of jam. Pour the mixture over it, and then bake the whole in a moderately hot oven until it has risen and is quite firm. This is sufficient for about seven persons.

JAM RISSOLE. To make these 2 oz. of margarine. ½ teacupful of water, 4 teacupfuls of flour, and a little jam are required. Melt the margarine in a saucepan; then add the water and bring them to the boil. Move the pan to the side of the fire and let its contents cool till they are just warm; then work in the flour and mix all to a fairly soft paste, adding more water if necessary.



Jam Rissole. Dish of a favourite sweet somewhat similar to doughnuts.

Knead the paste on a floured board until it is smooth, roll it out to the thickness of ¼ in., and cut it into rounds with a tumbler. Put in the centre of one round about one teaspoontul of jam, damp the edge of the pastry all round, and lay another piece on top of it, pinching the edges well together. Have ready a deep pan half full of smoking hot fat, put in the rissoles and fry them to a golden brown colour. Drain them well on paper, roll them in castor sugar, and serve at once. They can be made with far less trouble from a good short pastry.

JAM ROLL. This roll is made according to the directions given for jam sandwich, except that the mixture is poured to a depth of ¼ in. into a flat oblong-shaped tin lined with paper. When baked, it is sprinkled on one side with castor sugar and the other side is spread with warm jam. The cake is then rolled up quickly and left on a wire stand to cool. This is sometimes also known as a Swiss roll.

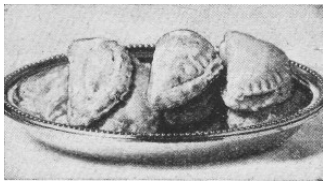
JAM ROLY POLY. This favourite kind of jam pudding is made by rolling out some suet pastry to an oblong shape and spreading it with jam except for a margin of ½ in. all round. Wet the edges and roll up the pastry. Wrap and tie the pudding securely in a scalded and floured pudding cloth, and boil it for about 1½ hours. Jam roly poly is also baked, but in this case a short pastry is used.

JAM SANDWICH. The cake known as a jam sandwich is made by whisking together for 15 minutes 6 oz. of castor sugar and 2 eggs. Into a separate basin sieve ½ lb. of flour and 1 teaspoonful of baking-powder and in a saucepan over the fire melt 2 oz. of butter. Fold the flour lightly into the eggs and sugar, and add the melted butter and the grated rind of half a lemon.

Grease two sandwich tins, pour half the mixture in each, and bake them in a very hot oven for 10 min. Place them on a sieve until they are cold, then split each sandwich and spread it with jam. Sprinkle castor sugar over the top and cut each cake into eight pieces and serve.

JAM SAUCE. This sauce is especially well suited to baked and boiled suet puddings. To make it blend a teaspoonful of cornflour with a little water, and boil what remains from ½ pint of the latter with 2 tablespoonfuls of any jam. Pour these on to the cornflour, and boil all for 5 min. Add the juice of a lemon, and then it is ready to serve. Syrup or treacle sauce can be made in the same way, two tablespoonfuls of syrup or treacle being used instead of jam.

JAM TART. Small jam tarts can be made by lining some patty pans with short or puff pastry, filling the cases with rice in order that they may not rise, and then baking them in a hot oven until they are lightly browned. They may then be filled with warm or cold jam of any kind, and served either hot or cold. A large open jam tart can be made in the same way, the pastry lining being pricked with a fork. If liked, some narrow twisted strips of pastry may be laid across the tart, but in a case of this kind the jam should be put in before the tart is baked.



Jam Turnover. Dish of the appetising pastry sweet sometimes known as jam puff.

JAM TURNOVER. Make 8 oz. flaky pastry and roll out about ¼ in. thick Shape it into small rounds with a fancy cutter, and on half of each place a teaspoonful of any kind of jam.

(Continued in page 1160)

JANUARY

What to do in the Garden

Flowers

Plant leaf-losing trees and shrubs in mild weather

Press down all outdoor plants raised out of the ground by action of frost

Plant roses in open weather

Patch bald spots in lawns with turf

Protect autumn-sown annuals, if necessary

Make alterations in directions of paths or shapes of flower beds

Sow seeds of tuberous begonia and gloxinia in the greenhouse

Take cuttings of perpetual-flowering carnations

Sow seeds of sweet peas under glass

Take cuttings of chrysanthemum

Maintain a minimum temperature of 45° to 50° in the greenhouse in cold weather

Give geraniums a shift into larger pots

Keep the hothouse at a minimum temperature of 50° at night, 70° maximum by day. The ordinary heated greenhouse may be at least 10° lower with safety

Fruit

Spray fruit trees out of doors with one of the tar-oil washes or with caustic soda solution

Prune fruit trees out of doors and vines under glass

Plant fruit trees and bushes when the weather is mild

To ensure ripe grapes in summer vines should be started into growth in a temperature of 45°–50°

Strawberries in pots to provide early fruits should be placed under glass

Vegetables

Sow seeds of onion under glass

Sow carrots and radishes in a frame

Early potatoes may be started in frames

Give the asparagus bed a top dressing of farmyard manure, if available

Go over stored root vegetables carefully, and remove all specimens which show symptoms of decay

Look up all vegetable articles in this Encyclopedia for instructions to obtain early crops

Food in Season

Fish

Barbel; bream; brill; carp; cod; dory; eels; flounders; gurnet; haddock; hake; halibut; herring; ling; mackerel; perch; pike; plaice; mullet (red); salmon (Dutch and Canadian); skate; smelts; soles; sprats; tench; turbot; whitebait; whiting

Shellfish

Crab; crayfish; lobster; mussels; oyster; prawns; scallops; shrimps

Meat

Beef; house lamb; mutton; pork; veal; venison

Game & Poultry

Capons: capercailzie; chicken; duck; fowl; geese; hares; landrails; larks; partridges; pheasant; pigeons; pintail; plover; ptarmigan; pullets; quails; rabbits; snipe; teal; turkey; wild fowl; widgeon; woodcock

Vegetables

Artichokes (globe, Japanese and Jerusalem); beetroot; broccoli; Brussels sprouts; cabbage; cardoons; carrots; celeriac; celery; chervil; chicory; cress; cucumber (forced); endive; horseradish; leeks; lettuce; mushrooms (cultivated); onions; parsnips; potatoes; radishes; salsify; savoys; Scotch kale; tomatoes; turnips; turnip tops; winter spinach

Fruit

Almonds; apples; bananas; Brazil nuts; chestnuts; cob nuts; cranberries; grapes; lemons; limes; medlars; oranges; pears; pineapple; rhubarb; walnuts

Notes for the Month

JAN. 1. New Year's Day. Bank Holiday in Scotland
JAN. 1. Stock Exchange closed
JAN. 1. Dog and Establishment Licences to be renewed

Damp the edge of the round and then fold over other half, pressing edges well together. Brush the turnovers with milk, and bake them on a greased baking sheet in a hot oven for about 15 min. The pastry should be made according to the directions given in the article on that subject. *See* Pastry.

JAPANESE ANEMONE. This valuable, hardy herbaceous perennial bears white or coloured flowers on stems 3-4 ft. high in September. It should be planted in autumn or spring in deeply dug and manured soil in sunshine or partial shade; it becomes established slowly and should remain undisturbed for years. It is a good plant for the shady border. The botanical name is Anemone japonica. Some of the finest varieties are alba, white; Queen Charlotte, rose-pink; Mont Rose, rose; Lord Ardilaun, double white and Lorelei, double rose pink.



Japanese Anemone. Delicate, long stemmed blooms of the autumn-flowering white variety.

JAPANESE CUCUMBER. This type of cucumber is very similar to the ridge variety. It is perhaps more productive, and may easily be raised from seed. It should be grown in rich soil in a sunny place out of doors, from seed sown in May.

Fruits grow up to a foot in length but, as the habit of the plant is really a climbing one, help must be given with branches or stakes so that tendrils may have good support. A four-foot trellis is excellent for the purpose. It must be understood that this variety does not compare with the frame cucumber either for quality or size. *See* Cucumber; Frame.

JAPANESE GARDENS AND GARDENING
With Instructions on Making a Dish Garden

The articles in this work that deal with the garden in one form or another include Garden; Italian Garden; Rock Garden. See also the entries on the various plants; also Path.

Ample space and a congenial position are essential to secure an artistic Japanese garden. The ideal position is near a running stream. Artificial hillocks and knolls or pools and shallow waterways may be constructed when missing from a position otherwise desirable.

Harmony must be maintained by using furniture and material of Japanese character for such adjuncts as a summer or tea house or a bridge over a lake. Typical Japanese trees and shrubs in pots and tubs will be attractive, with groups of the dwarfest kinds planted here, and there in hillocks and knolls. Quaint bridges should span narrow waterways, the shallow parts of which may be crossed by causeways of grey stepping-stones, while footpaths wander deviously through varying heights of ground. Where the soil itself is of a moist character, irregular slabs of stone should be placed to form a path. Aquatic plants are one of the greatest charms in Japanese gardens, and a home for these water-loving specimens, together with a pool for water lilies, must be included in the general scheme of the garden.

Screens and Hedges. The wistaria and Japanese roses should be utilized, as these are indispensable for covering structures, or hedging out an undesirable aspect. A boundary or screen of Japanese flowering trees, hardy bamboos, and evergreens is necessary where a natural one does not already exist. Near the centre of the garden there should be a dominant hill, with lesser hillocks, banks, and knolls, suitably placed in the picture. The path, perhaps, may complete a circuit, winding in and out, up and down, until eventually it rejoins at the point where it began, with a connecting path running to the centre. True circles and straight lines must rigidly be excluded from any ground plan.

There should be a lake consisting of two pieces of water joined by a narrow, curving bottle-neck channel: and as much of the charm of a Japanese garden is derived from its quaintness of detail, this bottle-neck, spanned near its middle by a bridge approached by an informal setting of grey, flat stones, may very well be one of the most fascinating spots. When excavation is necessary to make a lake, the soil removed may be used with advantage to form rising ground.

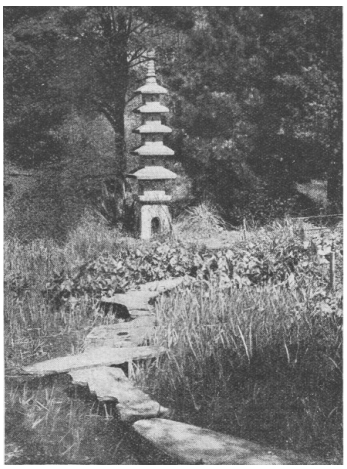
Bridges play an important part, and there are many curious and effective examples in wood and stone. Some are elaborate like the roofed bridges with their clustering wistaria, others just simple structures of faggot and bamboo covered with soil or turf. Another type is the familiar full-moon bridge, erected in a semi-circle, the reflection in the water beneath completing a circle, and thus creating the idea of a full moon. Where the watercourse is very narrow a simple slab of stone may be used.

At one end of the lake rockwork with alpines should be placed, while along its banks aquatics and water-loving plants may find their home. If possible, a garden well should be included, also a guardian tree of either bamboo, pine, or plum. An attractive adjunct is the square or octagonal lantern.

The lake, in most cases, will be the chief difficulty, but beyond a good deal of hard work, its formation is not insuperable; and being in close proximity to the proposed hill, or hillock, in the top left-hand corner the soil excavated may very well be used in order to form the rising ground.

Miniature Japanese Gardens. A fascinating pursuit which children can enjoy is laying out a little Japanese garden in a flat dish. Such a garden may

measure anything from 6 in. to 2 ft. or even more across. A shallow brown earthenware baking dish measuring, say, 12 in. by 7 in., is a useful size with which to make a start. The dish may be oval, oblong, square, or round, but an oblong is easiest to plan out successfully. The first thing is to decide on a rough plan of the garden; for instance, on the position of the little hill on which the pagoda is to stand, and the lake or pool, without which no Japanese dish garden is entirely complete.



Japanese Garden. Corner of this artistic and fascinating type of garden, with stepping stones leading between aquatic plants to the miniature pagoda.

Fill the dish with finely sieved and well-damped garden mould to just above the rim pressing it down firmly, and arrange a good hillock on one side. Next start out armed with a basket and a short, blunt table-knife in search of some fine vivid green cushion-moss with which to turf it. An old wall, or bridge, will often yield just the specially fine kind required. Add some tufts of rather coarser moss to serve as bushes and a few minute flowering plants. Low-growing Alpine rock plants sold at 6d. each are suitable. Moss can also be bought if it is not possible to obtain this on a country walk; quite a large piece is obtainable for 2d. Tiny imitation pine trees can be bought cheaply.

Children who live in the country can search in the shrubbery for minute seedling hollies or firs. The paddock or hillside will often produce tiny, dwarfed oak trees and beech trees, with miniature leaves, where the acorns and nuts have sprouted on very poor soil—just the thing for the dish garden. Failing these a small asparagus fern, costing sixpence, stripped of its lower fronds to leave a single tall stem makes an excellent Japanese acacia tree while a small plant of fine white heather will suggest a bush of white flowering broom.

A slab of rock such as is used for a rock garden, which can be flaked with a blunt knife, will provide flights of stone steps and miniature rocks beside the water's edge. Stones may be utilized taken from the roadside or garden.

How to Arrange the Garden

First thoroughly damp the moss, and, having damped and drained the mould in the dish (which, of course, has no bottom drainage), plant any trees with good balls of their own earth round their roots, and proceed entirely to turf the landscape, running the moss right up to the stems of shrubs and trees, and to overhang the lake or pool in the garden. Press it well down and make any necessary undulations in the surface. The trees should be perched up on the hill, to give it height, with the pagoda just beneath their shade.

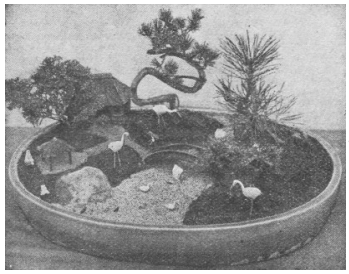
Arrange a winding flight of steps down the hillside to the water's edge, and one or more finely gravelled paths to meander between moss bushes and flowering shrubs round the outside of the garden. Shell gravel (procurable at any bird-seed shop for a few pence a tiny sack) scattered from a penny pepper pot with rather large sprinkler, or sand spread from a piece of paper made into a cone-shaped poke and used as if icing a cake, allowing the sand to trickle out of the hole at the end, can be used to make a level surface for the paths.

If space allows, place a rocky island in the centre of the lake, cementing it to the bottom of the small oblong glass or china dish used for this purpose, which must be lined with dull green plasticine (a penny stick will do) and covered with shell gravel before the water is poured in, planting a tuft of rushes beside the tiny landing stage formed of a scrap of rock half embedded in the turf.

Connect the island with the mainland by an arched bridge made of a short strip of strawberry punnet, stained dull green with water-colour paint, or formed of several minute brown twigs, wired with dull brown florist's wire to lie side by side. More elaborate bridges can be bought.

For a larger garden a real Japanese dwarf tree is often employed, and the tea house is placed under its shade. More elaborate gardens can be made in a corner of a conservatory and built up on a large tin tray.

If real water for the lake is objected to, substitute a piece of clear glass (a well-polished stripped negative glass does) over the top of the prepared hole, in which a minute toy goldfish has been arranged, with a tiny moss water plant, to add a touch of realism, or make no excavation, merely pressing a strip of looking glass on to the soil at just below dish-level, bringing the turf right over on to the surface to make irregular green banks. A bridge thrown over the water and a tiny, flat bottomed punt afloat upon the lake or pool complete the illusion.



Japanese Garden. Miniature Japanese Garden, the materials for making which are inexpensive and readily accessible.

Swinging lanterns are easily made from a vivid-coloured oval bead, with a smaller bead of contrasting colour on either side of it, arranged to swing from an iron stake formed of part of a bent hairpin.

Tiny figures, birds, tea houses, pagodas, boats, steps, summer houses, red bridges, and a variety of suitably tiny plants can be bought at a sixpenny store.

A fountain which will play in the centre of the real water lake is an additional attraction to the garden. For this a small oblong tin makes a good tank, with a hole bored in the bottom, to which a length of fine indiarubber tubing long enough to go from the bottom of the tank (fastened to the wall, or to the top of a stout garden stake, thrust into a flower pot, at least eighteen inches above the level of the water), and passed over the edge of the dish and under the turf along the bottom of the lake, to emerge from the centre of a tiny rockery (made from scraps of rock cemented together), with the nozzle of the glass tube (bent at right angles) fitted to the end of it, the join being carefully plastered with plasticine to prevent leakage. When in play the fountain will throw a water jet several inches high into the air.

To cut the glass tubing to the necessary length saw it half-way through with a three-sided file—it will then break easily at the point required. Point the end to be used as mouthpiece for the fountain by holding it obliquely in the flame of a powerful lamp, or in a gas jet, twisting it round and round in the flame, so that it may thicken evenly all round as the glass melts, and continue this until only a tiny hole in the centre of the tube remains. To bend it at right angles, hold it straight across the flame at the point at which the bend is needed; as it gets hot it gradually melts, and, bending with its own weight, falls downward at right angles.

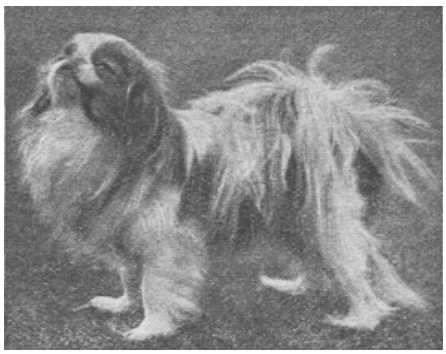
For a waterfall make a second hole in the tank, with a second length of tubing concealed beneath the turf to appear at the top of a rocky gorge, beside the pagoda, down which the waterfall can play. The mouthpiece of glass tubing must be melted to a fine point, as for the fountain, but need not be bent. The garden must be watered with a dolls' watering pot, and then tilted to drain about every other day, to keep the mossy turf green.

Japanese Golden Bell Flower. This is the popular name of forsythia (q.v.), one of the most beautiful spring-flowering shrubs.

JAPANESE MAPLE. A number of low-growing trees or shrubs, varieties of Acer japonicum and Acer palmatum, are known as Japanese maples. They are suitable for planting out of doors except in cold districts, for the rock garden, and for cultivation in pots in the greenhouse. The spring and autumn leaf colouring of some sorts is very beautiful. The following are some of the best varieties. Of Acer japonicum—aureum and laciniatum. Of Acer palmatum—roseo-marginatum, sanguineum, Osakazuki, septemlobum and dissectum are noteworthy. Miniature trees of the Japanese maples are sold by dealers. *See* Dwarf Trees.

JAPANESE QUINCE. This is the popular name of Pyrus (Cydonia) japonica (sometimes called japonica), a shrub which bears red flowers in spring. *See* Pyrus Japonica.

JAPANESE SPANIEL. This little snub-nosed, straight-haired, silky dog is a comparatively recent introduction to the list of ladies' toys in Britain, but in Japan they have enjoyed popularity for centuries. It bears a certain resemblance to another type of Eastern dog, the Pekinese, which has also found favour in England. It has a relatively large, broad head, short, wide muzzle, large, dark, lustrous eyes far apart, and small, V-shaped and feathered ears. The body is short and square-looking, the dog's length being equal to its height, which is about 10 in. at the shoulders.



Japanese Spaniel, a popular toy breed with a long, straight-haired, silky coat.

The spaniel has a profuse, rather silky coat, the long straight hairs with a tendency to stand out. The small legs, thighs, and tail are well feathered, and there is a thick ruff around the neck. The colour is clear white, with patches of black or some bright tint of red over the body, cheeks, and ears. It should weigh between 4 lb. and 9 lb., the lighter weights being more highly esteemed than the heavier. Its constitution is by no means robust, and great care is needed in the feeding of it. *See* Dog; Spaniel.

JAPAN LACQUER. This is a liquid made of shellac, or some similar resin, metallic oxide, turpentine, and linseed oil. It is used to a considerable extent as a medium when grinding and mixing colours, and as a drier to hasten the setting and hardening qualities. It is reputed to have originated in Japan. Virtually a hard black varnish, it is applied as such, and dries with a glossy and smooth surface. *See* Lacquer; Varnish.

JAPAN WARE. Articles treated with an application of Japan lacquer are known as Japan ware. The latter is used in the home in the form of tea-trays, bread-pans, candlesticks, etc., its main virtue being the ease with which it can be kept clean. Luke-warm water should be used for washing, and a soft cloth for drying and polishing. A smeared surface caused by grease should be sprinkled with a little flour and then rubbed with a soft cloth; hot water should not be used, as this invariably produces cracks.

JAPONICA. This old and favourite shrub usually may be found in nurserymen's lists either under Cydonia japonica or Pyrus japonica. *See* Pyrus Japonica.

JAP SILK. A great deal of silk is made in Japan and consequently that country is noted for the supply of cheap, plain and usually un-dyed silk, which is used very largely in Great Britain for blouses, dresses and linings, and for cutting and sewing into handkerchiefs and many other articles.

This silk is made in standard widths of 19½, 22½, 27 and 36 in. and in pieces mostly 50 yards long. The weight is designated by mommes, a Japanese unit of weight; the thinnest are 2 mommes and suitable for lining hats; 5 mommes silk is medium, and the heavier kinds run 8½ mommes and upwards.

The fabrics are mostly handwoven and made from comparatively unworked silk. When thicker silk is wanted the threads are not twisted together, as is usual in European cloths, but are gummed together and woven.

After weaving the cloths are boiled and the gum and paste are thus taken out of them, so improving the colour; they are made a still better white by being dried in the sun. They are sprayed next with gelatine to stiffen them, and are ironed or calendered between heated steel rollers. They are often irregular, containing minor defects, but are so cheap that small imperfections are overlooked. The silks are graded according to their quality.

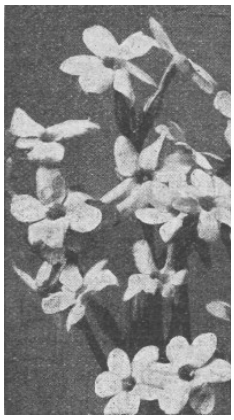
When Japanese silk is washed for the first time some loss of weight and substance may be expected, consequent upon the removal of the gelatine stiffening. This cannot readily be replaced in a made-up garment, and the attempt is likely to lead to cloudy patches. Soda in more than very small quantities ia bad for silk and weakens it. The best soap should be used for washing, and if a good heavy quality of silk is bought the lost weight will not be missed. A little vinegar should be used in the last water. The whiteness will be increased by drying outdoors.

Jap silks are dyed extensively in Great Britain by professional silk dyers and in colours to suit the demands of the season. Before dyeing, the pieces are well washed to remove the gelatine, which would cause unevenness of shade. They are treated, after dyeing, generally with some kind of starch to make them feel fuller, and so that they shall not be too stiff the starching is broken up by rubbing and brushing the cloth by machine. If a garment is to be re-dyed at home it should be beaten lightly to remove dust, be washed perfectly clean, and silk dye should be used on it. Jap silks are often printed in colours in Britain or in France, to befit them for dress materials, linings, and hat and neck trimmings. *See* Dyeing; Silk.

Jargoon. This translucent, colourless or smoky variety of zircon, found in Ceylon, is sometimes used to make imitation diamonds.

JASMINE. Two of the most popular hardy climbing plants are Jasminum nudicaule, which bears bright yellow flowers in winter, and Jasminum officinale, with white, sweet-smelling flowers in summer. The former is suitable for a sunny wall; it should be pruned as soon as the flowers are over by shortening the side shoots of the past summer's growth to within an inch or so of the base. The white jasmine should be planted to cover a trellis, arch or porch. It is difficult to prune this shrub systematically, because its long, slender shoots intertwine freely, but these ought to be thinned out in spring.

Both these jasmines nourish in ordinary soil, and as they are grown in pots they may be planted at any time, preferably in spring or autumn. They are propagated by cuttings in a frame or out of doors in autumn. Other climbing jasmines are Beesianum, red; primulinum and revolutum, yellow. They are suitable for planting against a sunny wall. Gracillimum, white, must be grown in a heated greenhouse.



Jasmine. Flowering sprays of the yellow winter jasmine.

JASPER. This opaque stone, a variety of quartz, is widely used for ornamental purposes. Several kinds are known, some being red, brown or yellow, while others have various markings, such as stripes and spots.

JASPER WARE. The hard, dense and vitrified biscuit ware which Josiah Wedgwood perfected in 1776 and called jasper is one of the triumphs of English pottery. For twenty years, until his death, the output was very large, especially of tiny cameos, generally portraits and classical scenes in white relief usually on a blue ground, although in various tones. A number of other colours were also employed as backgrounds.

Cameos were often set in gold and steel mountings for finger rings, brooches, buckles and other personal ornaments. Larger medallions, tablets, and plaques sometimes as much as 27 in. wide, were separately framed, or inserted in the fronts of cabinets and mantelpieces. During his last ten years Wedgwood produced some superb vases, whose exquisite finish was due to lapidary work after the firing. Of this the collector can hardly hope to secure the larger examples except at a substantial outlay.



Jasper Ware. Choice example of a vase of Turner jasper ware, height 12 in.(British Museum)

Wedgwood jasper is still produced in the original designs, and may be recognized by some differences in the mark, such as the addition to the word Wedgwood, after 1891, of the word England. In 1907 the date was fixed by a mark consisting of the figure 3, to denote that it was in the

third of the alphabetical cycles started in 1846, with a capital letter for the workman and another for the year, that for 1907 being J. The old mark Wedgwood & Bentley used on plaques, medallions and portraits during the period 1768-80 is not found on pieces with an olive, sage, pink, lilac, yellow or black ground, and not on blue-ground vases.

Jasper ware should be kept clean with soft leathers and a sparing use of plain water, because otherwise the unglazed surface tends to become streaky and discoloured.

Some of Wedgwood's pupils and rivals turned out jasper more or less according to his designs and recipes. Of these collectors prize the work of John Turner, whose blue ground is rather violet, and also of William Adams, whose descendants still produce a jasper-looking semi-porcelain. Foreign imitations and counterfeits of old jasper are usually poorly done and readily recognized. *See* Wedgwood.

JAUNDICE. This is a condition in which the colouring matter of the bile circulating in the blood gives a yellow hue to the skin, the mucous membranes, and also to the urine and other secretions. Jaundice is not itself a disease, but a symptom for which a cause must always be sought. The yellow colour is at first noticeable in the eyes.

It may be caused by gall stones or parasites obstructing the bile ducts, or by a tumour of the stomach, pancreas, or liver, etc., pressing on the bile duct. A very common cause of obstruction is catarrh of the bile ducts, and this may be produced by indigestible or ill-masticated food, a chill, excessive consumption of alcohol, etc. This catarrhal form of jaundice may pass away in a fortnight, and it rarely lasts more than six weeks.

Jaundice may accur in fevers and in poisoning by phosphorus and other substances. It may follow a severe fright, or a fit of anger, or other violent emotion, in which case it comes on suddenly and goes as quickly.

The treatment of jaundice will obviously depend on the cause, and the diagnosis should be made by a doctor. *See* Gall Stone; Liver.

JAVELLE WATER. An excellent bleaching agent prepared from chlorinated lime and pearlash, javelle water is much used for whitening discoloured clothes, and also for removing various kinds of stains. It can be purchased in a prepared form from chemists, or made up at home in the following way. Shake together in a bottle 30 oz. of water and 2 oz. of chlori-nated lime or bleaching powder and, when they are well mixed, add a solution consisting of 4 oz. of carbo-nate of potash (pure pearl-ash) and 10 oz. of water.

When the mixture has been allowed to stand for a few days separate the clear liquid from the sediment by means of filtration. White clothes only should be treated with javelle water, since the latter contains certain properties which destroy colour. For bleaching purposes about a cupful should be added to a copperful of water, and the clothes should soak in the solution overnight.

If used for removing stains, either from clothes or paper, the liquid should afterwards be washed off with clean water, otherwise the material may rot. Grass and ink stains and scorch marks on linen or cotton goods may be treated with javelle water; but in the case of a scorch alternate applications of oxalic acid solution are required.

JAZZ. The word is of American negro origin, and refers more to the music which is played in syncopated time than to the steps of a dance. There was nevertheless a rolling step known as the jazz, which formed part of the fox-trot; also a straight jazz step. The term "jazz band" is now out of date; instead, "dance orchestra" is generally used. Full-sized dance orchestras consist of piano, saxophones (sometimes clarinets), trumpets, trombones, and occasionally strings, with a percussion outfit and a Spanish guitar.

JEAN: The Material. Overalls can be made in jean, which is an especially strong cotton twill used in lining leather boots and in making corsets.

JELLIES AND THEIR MAKING

Strawberry, Lemon and Other Attractive Varieties

Recipes for other sweets for the table are given throughout this work under such headings as Ices; Trifle. See also Cherry Jelly; Children's Party; Mould; Sweets

Jelly is the name given both to the fruit jelly used as conserve and to the moulded table jelly. To make jelly the general principles are as follows:

The fruit should be on the under-ripe side, as pectin, the jellifying substance, is only fully present in under-ripe fruit. As pectin will only work in conjunction with acid, very sweet fruits should either have citric acid or the juice of more acid fruits such as apples, lemons, rhubarb, added.

The fruit, carefully picked over, should be put in a preserving pan with just enough water to keep it from burning. Very slow heat should be used to extract all the juice. Boil it gently until the fruit is pulped, then pour it into a jelly bag, and leave it overnight in order that the juice may drip through into a basin. Do not press the bag or the jelly will be cloudy. Measure the juice back into the preserving pan, and add the sugar, the proportion of which varies with the kind of fruit, but is usually about 1 Ib. to 1 pint of juice. It is important that the quantity of sugar should be exactly right. With too much sugar the jelly will not set; with too little it will be tough, so test for the quantity with a small amount of juice. If the jelly will not set, add a little citric acid or lemon juice until the desired consistency is reached, and then add the acid in the same proportion to the juice in the pan.

Boil the syrup again until a little jellies when dropped on a cold plate. If it is boiled too long, the jelly loses flavour and becomes dark and sticky; if not

boiled enough it will not set. Pour it into warmed jars and tie down at once. The pulp left after the juice is abstracted can be mixed with apples or some other juicy fruit for making jam.

Jelly Bag. This device for straining the juice from the fruit in the making of jelly is a cone of felt or of strong flannel with loops of tape at the mouth, by which it is hung while the fruit is straining. In making a bag remember that it must be large enough to hold all the fruit likely to be converted at a time. Double-sew the seam, so that no juice escapes through filtration. A clean coarse cloth is often used instead of flannel.

A stand can be obtained to which the jelly bag is fastened, but can easily be improvised at home, the loops on the bag being hung on to the backs of two chairs. A quickly improvised jelly bag can be made as follows: Turn a kitchen chair upside down on the edge of the table, then tie the corners of a square of strong, new flannel to the four legs. A large bowl is then stood upon the inverted seat to catch the juice. The jelly bag must always be moistened with hot water before the fruit is poured in.

The jelly bag illustrated is very useful for making small quantities of jelly. An ordinary basin is placed on a table where it will not be disturbed, and the jelly bag fixed over it.



Jelly Bag for straining small quantities of jelly.

A jelly bag should not be washed with soap. As soon as it has been used put it into a basin of boiling water, and stir it about with a stick. Change the water once or twice as it becomes dirty, then add some cold, and wring it out. Rinse it well, then dry it in the open air, but be sure that it is quite dry before putting it away.

Table Jellies. These are made either with gelatine and fruit flavourings or by pouring boiling water on to a preparation obtained in crystal or powder form, or as a lump of very solid jelly, which is cut up into squares.

In making a fruit jelly of the first kind, the quantities and methods of preparation vary with the different fruit. The following simple recipes give some instances:

Strawberry Jelly. Strawberry jelly is made without boiling the fruit. One pint water and ½ lb. loaf sugar are boiled with ¼ pint red currant juice, and this syrup is then poured over ½ lb. carefully picked strawberries. When cool, 1 oz gelatine, dissolved in a little water, is added, and the whole is poured into a mould.

Lemon Jelly. Lemon jelly is made thus: Dissolve ½ oz. gelatine in 1 pint water, then add the grated rind of 4 lemons and the juice of 2, and ½ lb. loaf sugar. Then, to clarify the jelly, add the white of an egg, and the shell, crushed in the hand. Put the whole on the fire and whisk it continuously until on the point of boiling. Then strain it and pour it into a wet mould to set. This jelly is usually clarified. Orange jelly is made in the same way, but needs only 5 oz. sugar.

Wine Jellies. To make wine jellies, such as claret cherry or port wine, use 1 oz. gelatine to one bottle of cheap wine and ¾ lb. loaf sugar. Simmer until gelatine and sugar are melted, and then boil for 5 min. Add a little carmine or cochineal in order to give a better colour if necessary. Strain into a mould and leave to set.

To decorate a table jelly with fruit it is necessary to line the mould with jelly to keep it in place, before the bulk of the jelly is put in. This is done by taking two moulds of the same shape and pattern, but one slightly smaller than the other. Let a little cool jelly mixed with fruit set in the bottom of the larger mould. Then put the smaller one inside it, and fill up the spaces with fruit and jelly. When this is quite set pour a little hot water into the inner mould which can then be removed without difficulty.

In making a packet jelly with the addition of fresh fruit it should be remembered that less water is needed; fruit and water together should measure only a pint.

Jelly Mould. There is a large variety of moulds for table jellies, both as to shape and size. They are made of tin, aluminium, china, or glass, and are usually ornamented with some raised design which is reproduced on the jelly. Frequently the design is of fruit, and in that case it is desirable to use a jelly of the same flavour. A pineapple jelly, for example, may be set in a mould decorated with a pineapple, and a jelly flavoured with port or claret in a mould with a bunch of grapes upon it.

The mould should not be very deep in comparison to the width, or the jelly may break upon being turned out. Some moulds are made with a deep indentation in the bottom, the corresponding hollow in the jelly being then filled with whipped or clotted cream or with chopped fresh fruit or a purée of fruit.

Before using a jelly mould, make sure it is quite clean, then fill it with cold water and let it stand for a few minutes. When the jelly is ready to pour into it, empty out the water, but do not dry the mould.

Jelly Fingers. These quickly prepared sweets are made from half a dozen sponge fingers, a pint of raspberry jelly, and an ounce of almonds. Pour a thin coating of the jelly in a shallow glass dish, and when it has set arrange the sponge fingers on top, leaving about 1 in. of space between each.

Soak them with a small quantity of jelly, and cover the top with the almonds, blanched, skinned, and each split into three or four pieces. Pour over the remainder of the jelly, taking care to keep the biscuits in position,

and leave it to set. Then cut out the fingers with a sharp knife and arrange them tastefully on a glass dish.

Jelly Trifle. A trifle made from sponge cake and jelly, and decorated with almonds and whipped cream, is prepared thus: Cut 4 large sponge cakes into halves, and arrange them in a dish with the cut sides downwards. On the top of them stick 1 oz. of blanched, skinned, and halved almonds, and pour over a pint of strawberry jelly. Leave the whole until it sets, then decorate it with a gill of whipped cream, sweetened to taste. A layer of pineapple or sliced peaches may be placed under the sponge cakes and the cream ornamented with crystallized violets and angelica strips.

JERSEY WONDER. These fried cakes are made as follows: Rub 3 oz. butter into 1 Ib. flour, and then add 3 oz. castor sugar, and a little ground nutmeg, ground ginger and grated lemon peel, and mix to a stiff dough with 4 well-beaten eggs, and, if liked, a few drops of brandy. Turn the dough on to a floured board, and roll it out to a thickness of about ½ in., and then cut it into oval shapes, about 4 in. by 3 in.

Two slits should now be cut down the centre, not cutting through the ends. Pass one side of the cake through the slit in the other side, and drop it at once into a pan of boiling fat. Turn it in about 2 min. time, and in another 2-3 min. it will be done, and nicely risen. Take it out with a fish slice, and drain on kitchen paper. Several of the cakes can be cooked at the same time.

Jerusalem Artichoke. An easily cultivated plant belonging to the sunflower family, with edible roots. *See* Artichoke.

JERUSALEM SAGE. This is the popular name of Phlomis fruticosa, a half-shrubby plant about 3 ft. in height, with sage-like leaves, and yellow flowers in summer. It thrives best on light soils, and is propagated by seed sown in spring, or by cuttings during the summer.

JET: For Wear. The best hard jet is very tough, and can be carved and then polished with jeweller's rouge. Formerly almost the only jet ornaments available were massive and funereal-looking brooches and necklets. For modern neck ornaments jet is often used in bead form with crystals.

Imitation jet is really a variety of coal, cannel coal, highly polished, and so skilfully cut that it is difficult on inspection only to detect the difference between it and the more costly genuine jet.

Besides being made into jewelry, imitation jet, which is a composition of black glass, hard black wax and other substances, is used for trimming dresses.

To clean jet, wash it in warm, soapy water, and dry in sawdust, but if it is regularly brushed with a soft brush each time after use it will not be necessary to wash it very often. This is an advantage, because although the jet itself is not affected by washing, the material on which it is threaded deteriorates when wet, so the process should be avoided as much as possible.

JEWELRY. Fashion plays a great part in the wearing of jewelry. One year it is correct to wear precious stones in the daytime; another year, except at the smartest afternoon functions, they will be seen only in the evening. In any case good taste is governed by a certain simplicity. Pearls and coloured stones are seen to best advantage without any mixture except diamonds. For instance, a sapphire and diamond pendant should not be worn with ruby or emerald bracelets or brooches, or it will lose its distinction.

Where a particular gem is liked, it is a good plan to collect the various pieces of jewelry to form a set, choosing a simple artistic design unlikely to go out of fashion, and the stones themselves for colour rather than size. If a large piece of oriental or modern art jewelry introducing a number of coloured gems set in filigree gold or worked silver be worn, it looks best, as brooch, clasp or pendant, without other ornaments.

The same isolation may be observed with carved Chinese pendants of chalcedony, amber or jade, into which further colour is often introduced by the threading of amethyst, coral or carnelian beads on to the loop of the pendant; also with the long chains of semiprecious beads which in themselves provide a trimming for a dress.

Pearls are always fashionable, either real or counterfeit, many of the finest imitations and artificially cultured specimens defying detection except by the expert. Single pearls, or pearl hoops and tassels, are favourite forms of earrings, and old seed pearl ornaments look well worn with a black evening dress, though they need careful handling.

For modern jewelry French settings are, as a rule, most admired. Yellowish or greyish tinges in diamonds detract from their value; sapphires should be of a rich royal blue or they lose their beauty at night, appearing to be black. The finest Burmese rubies are of the coveted pigeon blood colour; emeralds are rarely without a slight flaw. These four stones are well imitated in paste, some of the old French examples being set with exquisite finish, and in the case of coloured paste often mounted with real brilliants. Modern paste has a fine lustre when new, but it deteriorates, and it can always be distinguished by the expert on account of its comparative softness. Another form of imitation gem sometimes sold in cheaper jewelry is the doublet, a thin piece of real stone cut to form the front, while the back is paste.

Rubies, sapphires and emeralds are cut in the same ways as diamonds or en cabochon, that is, with a rounded surface, which has a beautiful effect in rings when the coloured stone is surrounded by brilliants. For opaque or semi-opaque stones such as turquoise, cat's eye or opal, the cabochon form of cutting is always used. The beauty of turquoise lies in its lovely blue colour, but it is liable to turn green and the stones should be kept from contact with grease or perfume.

The opal suffers from the persistent superstition that it is unlucky, but a fine specimen possessing brilliant flashes of fire always holds its place in public favour. The opal is a soft gem and easily dulled by scratching after much wear. This defect can be removed by a jeweller and the surface brilliancy entirely restored.

Victorian Styles. Many of the less precious coloured gems are exceedingly beautiful, such as peridots of soft, transparent green; topaz, pink and yellow; aquamarines, sea-coloured, as their name implies; tourmalines, red, pink, green and brown. Victorian pieces of garnet jewelry have returned to favour with the cameo and onyx. The last named, which is chalcedony stained to a black, has been used with diamond workmanship for exclusive designs in jewelry of all kinds.

Earrings are probably the most valued of Victorian pieces of jewelry, as many of these show fine quality of workmanship. Filigree or chased metalwork settings for black or blue enamel or turquoise are sought after. Much Victorian jewelry was made of, or set in, pinchbeck, a metal which was composed of a mixture of zinc and copper and practically untarnishable. Pinchbeck was an invention of a 17th-century jeweller of that name. Only those pieces of pinchbeck jewelry made before the 19th century have value for the collector.

Amethysts, never out of fashion, are best when of a deep purple. The alexandrite possesses the quality of appearing by daylight a rich green and by artificial light changing to red. Moonstones with their silvery semi-opaque shimmer are very pretty set in conjunction with coloured stones, especially red. In the 20th century the fashion has been for geometrical designs in the setting of jewels rather than the copies of birds, insects, flowers, etc., favoured during the latter half of the 19th century.

All kinds of semi-precious stones and also ivory, amber and coral are formed into beads for necklets and long chains. Lapis lazuli is popular on account of its deep blue colour, and it is imitated in stained agate. Jade, either green or white, is not imitated so successfully. Jet, though chiefly used for mourning jewelry, is effective when combined with crystal for necklets. Jewelry for men, now that the wristlet takes the place of the watch chain, resolves itself into pearl studs for evening wear, cuff links, and a signet ring. *See* Bracelet; Brooch; Diamond; Emerald; Earring; Pearl; Ring; Ruby.

JEW'S MALLOW. This is the common name of Kerria japonica, a hardy Chinese shrub, about 3 ft. high, which has yellow flowers in spring. The double variety, which bears much larger flowers, is more vigorous and an excellent wall shrub; it is one of the few shrubs that do fairly well on a wall facing north. It thrives in ordinary soil and is increased by cuttings placed in sandy soil in a frame in August. Pruning should be done as soon as the flowers have faded by cutting out the oldest branches or parts of them. If grown in pots, the Jew's mallow is very useful for the cold or slightly heated greenhouse in spring.

JIGSAW PUZZLE. To make one of these puzzles it is best to start on a small puzzle for practice. For this a suitable coloured picture on thin paper can, as a rule, be found in an old magazine or weekly paper. A picture with a shiny surface should be chosen, as dull-surfaced paper becomes so quickly soiled with handling when fitting the puzzle together.

The more definite the picture the easier it will be to put together. A puzzle with a wide expanse of clouds and sky, or of softly shaded fields, for instance, is much harder than one with a scene depicting huntsmen and hounds in full cry, or a dog study.

Experienced jigsaw puzzle solvers delight in a really difficult puzzle. One of the most successful ways of gratifying their desire is to choose a large figure subject which fills most of the picture, and to cut away the background, leaving the puzzle solver no clues in the shape of straight-sided border pieces and the eagerly sought-for corners.

Making a Puzzle. The tools needed in jigsaw puzzle making are few. A small fretsaw and frame, a set of extra blades, and a wooden cutting-table—a metal cutting-table is apt to blunt the blades—and clamp, to enable it to be fastened to the edge of any convenient steady table. It is essential to use proper fretsaw wood on which to mount the pictures, as other kinds will be found to split. Good quality 3-ply wood is the right thing to use. Satin-walnut wood is also excellent, and there are other kinds of good thin wood which fretwork material outfitters will recommend. From 3/16 to ¼ in. thick are the best widths.

To start, make some good strong paste from a tablespoonful of flour, mixed to an absolutely smooth cream with a little cold water, and made up to half a pint by the addition of boiling water, poured in slowly, stirring the mixure all the time. The paste should gradually thicken and clear, becoming semi-transparent; if necessary, turn it into a small saucepan, and stir over a low flame to attain this result. Set it aside to cool; when cold it is ready for use. Trim the picture carefully, removing any white margin, and, placing it face downward upon a sheet of clean, white kitchen paper, brush it over with paste, and then leave it for five minutes to expand.

Brush it over with paste a second time and, lifting it up carefully by the two top corners, place it face upward upon the fretwood, and press it down until absolutely smooth with a pad of white cotton rag. Make sure that it lies absolutely flat, and that any air bubbles have been smoothed out, before placing a sheet of white paper over it and putting it under a pile of heavy books to press until it is quite dry. Meanwhile, fix the cutting-table to the edge of any steady table of convenient height for fretsawing, and when the picture is absolutely dry proceed to cut it out to the exact edge of the margin.

Now take a pencil and, placing the picture face

downward, mark out the pattern of the jigsaw pieces into which you intend the puzzle to be cut. In doing this, remember to avoid sharp points or too thin waists to the individual pieces, as these are liable to break off when the puzzle is in use. Count the number of pieces marked, and note down the number.

For the first attempt it is as well to keep the pieces of fair size, and of not too intricate a pattern. Place the picture face downward on the cutting-board, and proceed to twist it about with the left hand to bring the line to be cut into contact with the cutting edge of the saw, which works up and down perpendicularly in the hole in the cutting-table provided.

When once the knack has been obtained, the work usually goes very swiftly, and soon the puzzle is cut out. Gather the pieces up carefully, counting them to make sure that none are missing, and mark each piece on the back with the same small device—a star, a heart, an arrow head—in water colour, so that if accidentally mixed with the pieces from another puzzle they may easily be re-sorted. Pack them into a small cardboard box, upon the lid of which a label should be neatly pasted, giving the title of the picture and the number of pieces it contains.

When mounting a picture that is printed on rather thick paper it is a good plan to well damp the back with a sponge squeezed out in cold water, leaving it for five minutes, and repeating the process a second time, and again leaving it fully to stretch before brushing it with paste and mounting it in the usual way. If a picture is brushed with paste and mounted without waiting for it to stretch, it is apt to dry into countless minute wrinkles which it is impossible to smooth away, and the picture is ruined. *See* Fretwork.

JOB'S TEARS. The name of Job's Tears is given to a half-hardy grass, Coix lachryma Jobi, 2-3 feet high, which is attractive when mixed with cut flowers by reason of its drooping clusters of pearly seeds. It requires rich light soil and a sunny position. Seeds may be sown in a temperature of 60° in spring, transplanting seedlings during May.

John Dory. *See* Dory.

JOINERY: ITS GENERAL PRINCIPLES

The Choice of Materials and the Tools to Use

A knowledge of joinery is indispensable to those who wish to make the many woodworking articles about which directions are given in this work, such including Bureau; Cabinet; Cupboard; Dresser and many others. See also Amateur Carpentry; Bench; Joint; Wood, etc.

Joinery is that branch of woodwork concerned with the preparation of the more ornamental parts of a building, and particularly the art of joining wood to form a strong structure, durable and pleasing in appearance. Joinery is allied to carpentry; but although many of the tools used are common to both, carpentry is, generally speaking, a rougher class of woodwork.

In addition to a knowledge of the various timbers in common use, it is necessary for the joiner to know the limitations of his material. Joinery becomes ineffective in general for three particular reasons: first, by warping or splitting of the material; secondly, owing to failure of the joint due to the expansion and contraction of the wood; and thirdly, as a result of the natural process of decay. In good joinery all parts should be framed together in such a way as to allow for shrinkage or expansion, at the same time proportioning the thickness and breadth to prevent warping. Another point is that the work should be put together so that no end grain, or the minimum of end grain, is exposed to the weather. The end grain is the most liable to attack, because it virtually consists of a series of small pipes conducting moisture to the interior. To reduce shrinkage, all exposed parts should be as narrow as possible, this applying mostly to those members which happen to be framed up.

Choice of Material. It is a counsel of perfection to specify that all material should be thoroughly seasoned; that the wood should be chosen from the heart of the tree, and that sapwood, the portion of the tree which surrounds the heartwood, should be rejected.

Wood employed in joinery comprises battens or scantlings, measuring from 2 in. to 7 in., boards ranging from 7 in. to 9 in. wide and up to 2 in. thick, and planks, that is, stuff wider than 9 in. Deal is the name given to sawn timber 9 in. wide and from 2½ in. to 4 in. thick. The name does not necessarily apply to yellow deal only, and the term is frequently used to distinguish different kinds of timber, though it properly only means any timber cut to the sizes specified above. Thus the name white deal is commonly used to mean spruce, because this tree is cut into deal for export. Quartering is another name by which certain sizes of sawn timber are known; it is applied to stuff approaching the square in section, as 3 in. by 3 in. or 3 in. by 2 in. All timber should be subjected to a second seasoning after it has been sawn into boards or planks, and from the joiner's point of view this second seasoning is the more important one.

A useful wood is American whitewood, which is obtainable in various widths and thicknesses and is free from knots. It is susceptible of effective treatment with stain and takes a good polish. Mahogany, walnut, and similar ornamental hardwoods are also employed, but for most work ordinary softwoods are used. Of these pine, particularly yellow pine, is the most serviceable for many purposes in the home.

For the provision of panels and all places where large pieces of thin boarding are required, a useful material for the amateur joiner is plywood. Its use saves much trouble in planing, and it has the added advantage of not being liable to warp or shrink when in position.

Tools for Joinery. The tools required by the joiner include planes and saws, together with a good selection of firmer, paring, and mortise chisels, and firmer and scribing gouges of different sizes, brace and bits, hammers, pincers, and oilstone. A well-equipped workman will need a quantity of special planes, such as a plough, a fillister, rebate planes and beads, moulding and compass planes, hollows and rounds. Much joinery work is done by machinery. Accurate planing is done by thicknessing machines, moulding and beads are cut by formers, curves are cut by handsaws, and mortises and tenons and dovetails are cut by special machines. The setting out of intricate pieces of work calls for skill and experience and the accurate use of the rule, square, and bevel, even if the work is partly done by machine.

A solid work bench is essential, and should be about 6 ft. in length and 2 ft. in width. A heavy kitchen table provided with a bench top may be used; but the best work requires a properly constructed bench provided with a strong vice.

The amateur woodworker who takes up joinery should commence by making a careful study of joints and the methods of making the various kinds. Many of these are specifically dealt with under their respective headings, and a general article on the subject follows the present one. Amongst them may be mentioned for special notice the housing joint, the mortise and tenon, the mitre dovetail, and the various classes of halved joints.

It is an excellent plan to begin by practising on a piece of softwood, and in this way to acquire some degree of skill in planing and sawing to a line, for it is little use trying to make even the simplest joint unless the wood is accurately planed, marked out, and sawn. The tools must be kept in the best condition. The plane should be sharpened and set to take a fine shaving. The saw should be sharp, and the thickness of the cut made by it noted; neglect of this precaution will spoil a joint. Chisels should have keen, sharp edges, obtained by grinding and sharpening on an oilstone.

Care must be taken to guard against bruising the wood, for which purpose the use of a mallet is preferable to a hammer. When knocking the parts of a joint together, it is helpful to interpose a rough piece of wood between the mallet and the joint. It is also desirable when erecting the work to see that it does not come into contact with the tools, as if the wood is badly bruised it will be difficult or impossible to eliminate any defects that are made.

Generally the operations involved in joinery include sawing, planing, edge and end grain shooting, rebating, grooving, moulding, and mitreing, in addition to the construction of joints and frames. The proportioning of panelling is an important part of joiner's work, as are the relation of the panel to the width of stiles, rails, and muntins and the size and shape of the mouldings and beads, while the effect of light and shade on the surface calls for skill and experience. All joinery requires a good surface finish and neat accurate joints. The latter are obtained by careful workmanship, and the former by diligent scraping and glasspapering and leaving the work in a suitable state from the plane. Scraping is done with a specially prepared piece of steel, which is held at an angle to the work and operates by removing fine shavings from the surface. The use of the scraper is essential when dealing with hardwoods, because it is almost impossible to plane the surface without leaving some marks. With the exception of knots on the surface of softwoods, it will generally be possible to obtain a smooth surface with glasspaper, but if the wood contains many knots it will be advisable to use the scraper.

JOINTS: IN WOODWORK

An Important Detail of the Woodworker's Craft

Supplementary to this general article are shorter entries on the various joints, e.g. Butt; Dovetail; Halved Joint; Housing Joint; Mortise; Rule Joint. Reference should also be made to the entries on Bookcase; Bureau; Cabinet Making; Drawer; Glue; Table, etc.

For the sake of convenience, many of the best-known and specific joints are dealt with in this work under their respective headings.

Joints are used in woodwork generally for one of two reasons. Either the size of the material available is insufficient for the purpose, in which case a joint is necessary; or joints are made so that the various components can be arranged to the best advantage from the point of view of the direction of the grain of the wood and the relative proportions of the various pieces. In the former case the joint is often effected by simply glueing both pieces of the material and clamping them together while the glue sets hard. The second case comprises all those structural joints, such as the mortise and tenon, in which one part is shaped to fit into a hole made in the other part. Essentials of any joint of this character are (a) that the fitting surfaces of the wood shall be accurately shaped, so that when assembled the joint is virtually solid wood; and (b) that the one part is flat or true with the other, since a very small error in the shaping of the joint faces causes the one part to take a different direction relative to the surface of the other, with the result that the finished job will be distorted or in the state known as winding.

One of the simplest joints in woodwork consists merely of placing one piece of wood upon the other and glueing and screwing them together; or in the case of light work, sticking them together with an adhesive cement or glue. When these joints are effected by nails or screws, they are generally known as butt joints.

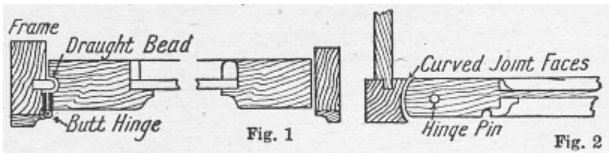
In constructional work, or when it is desired to effect a strong joint between two pieces that will be called upon to resist considerable strain, the joints are often effected by shaping the ends of the faces so that to some extent they interlock. They are further secured by means of nuts and bolts.

Still another series of joints is effected by cutting recesses or grooves to receive the other parts, and this

series of joints is generally known as housing joints. Dovetail joints are adapted to resist strain in certain directions, that is to say, the grooves or holes in the one part are so shaped that the leg or end of the other part can be pulled out only in one particular direction. There are many varieties.

A form of joint extensively used is that in which the one part, such as a panel, fits in a recess or groove in a frame. In the former case a portion of the edge of the framework is cut away, either with a cutting gauge or with a rebating plane, the space so cut away being known as a rebate. The joint is in this case effected by placing the panel in position and securing it with a bead or fillet. When the panel fits into a groove, the latter is produced with a plough plane.

Sliding joints are sometimes necessary in woodwork to provide for the shrinkage or expansion of the material according to the humidity of the atmosphere. These are all more or less in the form of a ploughed groove or a long slot of some kind, to hold the material from warping or twisting, but to allow it freedom of expansion and contraction in the direction of its greatest breadth. The jointing surfaces of wood may be secured by an adhesive, by nails, screws, bolts and nuts, pegs, and also by means of a variety of special fasteners, such as corrugated fasteners and drawbolt fasteners. To tighten up the joint surfaces, a commonly used plan is that known as draw-boring (q.v.), in which a peg is arranged so that it draws the faces of the joint together very tightly.



Joint. Figs. 1 and 2. Hinged and shutting joints in plan.

Another class of joint includes the varieties known as hinged and shutting joints. In good-class work the joint is rebated and provided with a dust or draught bead, Fig 1, and is then a combination of several joints. When a door is hung on a centre pin, the joint surfaces have to be curved, as in Fig. 2.

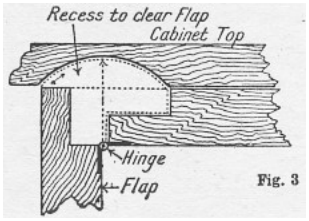


Fig. 3. Internal hinging joint used in cabinet work.

Many pieces of furniture are made with internal hinging joints, such as the section shown in Fig. 3, which shows how each piece of material has to be shaped to allow for the rise and fall of a flap, as in a bureau.

Among miscellaneous joints is the device known as pocket screwing, Fig. 4, which consists in boring a hole obliquely through the rail or similar part, and gouging out a recess or pocket in the side of the rail. This allows the screw to be inserted, and provides a flat surface for the head to bear upon. This device is used for fixing table-tops.

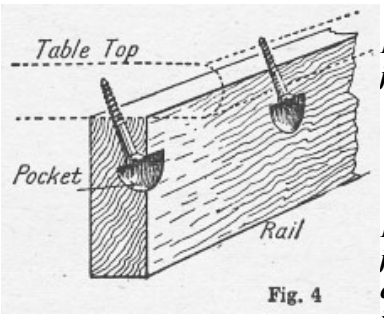
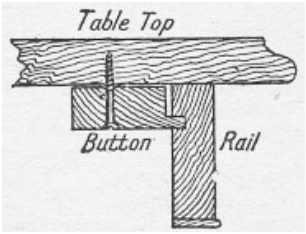


Fig. 4. Pocket screwed joint in part section.



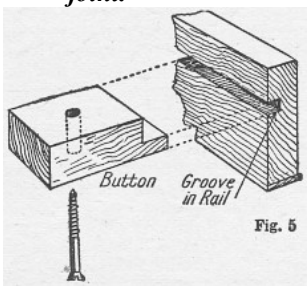


Fig. 5. Buttoning joint; right, sectional end view of assembled joint.

Another type of joint is known as cleating or clamping. It is simply a batten screwed to the separate parts to be joined together. Fig. 5 shows a buttoning joint, which comprises a rectangular block of wood rebated to fit into corresponding grooves formed in the rail or fixed part of the construction. The button or wood block is then screwed to the table-top or elsewhere, bringing it firmly into position. It is an excellent joint for fixing a table-top on to the side rails of the table. Slot screwed is another form of joint which is easily carried out and effective in use. It consists of cutting a slot through one of the parts to be jointed and securing it to the other with a screw.

Dowelled joints comprise all those forms where the two jointing faces are flat, and kept in position by one or more pegs fixed firmly into one part, with a portion of the dowel projecting, which fits into the hole formed in the other part of the joint. The dowelled joint may be permanent or detachable, as desired.

JOINT: Of the Body. Joints are fixed, as those of the skull; partially movable, as those between the vertebrae; or freely movable, as the hip, shoulder, etc. In the movable joints the ends of the bones are covered with smooth cartilage, and the joint is surrounded by a sheath of fibrous tissue lined with the synovial membrane which exudes a lubricating fluid into the joint. Inflammation in a joint may be synovitis, when it is mainly this membrane which is affected, or arthritis (q.v.), when all the structures of the joint are involved. Other diseases and injuries to which joints are subject will be found under appropriate headings. *See* Ankle; Dislocation; Elbow; Hip Disease; Knee; Rheumatoid Arthritis; Shoulder; Sprain; Wrist, etc.

JOINT: Of Meat. The parts into which animals that are killed for human consumption are cut up are known as joints. The names of the various joints are

given under the headings referring to the different animals. The names given are those in general use, but the names and the methods of cutting differ somewhat with the locality. *See* Aitchbone; Bacon; Beef; Carving; Lamb; Pork; Veal, etc.

JOINTER. This term is used to describe two entirely different tools. In the one case it refers to a large plane, resembling a jack-plane, used when planing the edges of boards preparatory to jointing them together.

The bricklayer's jointer is composed of a cast steel blade, tapered at one end and having a handle attached at about an angle of 45° to facilitate its use in pointing in brickwork. It is used to smooth or finish the pointing or joints between brickwork, particularly the type known as flush pointing. *See* Plane; Pointing.

JOINTING RULE. This implement, used by plasterers and bricklayers, consists of a batten of wood about 5 ft. long, 3 in. wide and 1 in. thick, bevelled on one edge. It is used for floating or levelling the surface of plaster in the angle of a room, or for working the surface of a screed on a wall, or any other place where a flat surface of plaster is to be built up. It is also used by bricklayers in the jointing of horizontal and vertical joints in brickwork, particularly in the pointing operations.

The amateur can easily make such a tool from a piece of ordinary clean deal, but it is imperative that it be planed up perfectly true and straight and sandpapered, as any roughness on its edges would be transferred to the surface of the plaster. Its form and method of use are illustrated in the article on plastering.

JOIST. The word joist is applied to horizontal supports for floors or ceilings, and in domestic work joists are generally composed of timber, although the use of rolled steel is common, especially in connexion with ferro-concrete constructions. Joists are further described by the addition of the name of the part of the structure to which they act as a support.

For example, the floor joists support the floor, ceiling joists carry the ceiling, and sleeper joists are placed upon the honeycomb sleeper walls under the floor, and act as an intermediate support for the other floor joists. Dovetailed sleeper joists are often embedded in the concrete of a floor as a convenient means of attaching the floor covering in the form of boards, which are nailed into the sleeper joists.

The joists should be of adequate strength for the load they will be called upon to sustain, and for the ordinary type of small house the ground floor joists, which are supported by sleepers at about 3 ft. centres, may be 4 in. deep and 2 in. in thickness. For an upper floor the joists must be much larger, dependent upon the span of the building, but in the case of an ordinary sized house where the joists have a span width of 12 ft., a convenient size is 7 in. deep and 3 in. in thickness, or 9 in. deep and 2 in. in thickness. In the former case there is no necessity for intermediate strutting between the joists, but in the latter it is desirable to fix diagonal struts of light section, about 2 in. deep and 1½ in. in thickness, to prevent the joists twisting sideways. The average spacing of the joists is about 15 in. for the ordinary 1 in. floorboards.

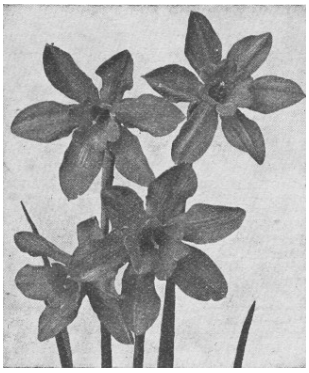
Ceiling joists usually average 4 in. in depth, and 2 in. in thickness, spaced about 14 in. apart, and are strengthened and supported by longitudinal members, so that the span does not exceed 5 to 6 ft. *See* Floor; Roof.

JOLLY MILLER. This game can be played either indoors or outdoors. Each man of the party, with one exception, chooses a lady for his partner. The excepted one stands in the middle of the room, while the others in couples walk round him singing:

There was a jolly miller who lived by himself,
As the wheel went round he made his wealth;
One hand in the coffer and the other in the bag,
As the wheel went round he made his grab.

At the word grab everyone must change partners, and while they are doing this the miller tries to seize one of the ladies. If he succeeds in this, the man who is left without a partner takes the place of the miller and so the game continues.

JONQUIL. Bulbs of the common sweet-scented jonquil, a variety of narcissus, should be planted 3 in. deep and about 6 in. apart in autumn. They are equally valuable for forcing or for planting as a woodland flower. Double campernelle is a particularly noteworthy variety of this flower. There are several fine modern varieties with large, bright yellow flowers, e.g. Buttercup and Golden Sceptre. *See* Daffodil; Narcissus.



Jonquil. Large-flowered variety of this sweet-scented member of the narcissus family.

JUDAS TREE. This is a hardy summer-leafing, ornamental tree, Cercis siliquastrum, about 15 ft. in height, with purplish-pink, pea-shaped flowers in late spring. The flowers are out before the leaves have fully developed.

The tree is common in Judea, and Judas is said to have hanged himself on one. It is grown from seed sown in spring. Propagation by layers in autumn may also be practised if there are branches situated in convenient positions.

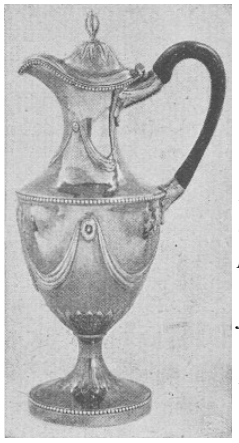
JUDICIAL SEPARATION. This used to be called divorce a mensa et thoro (from table and bed), to

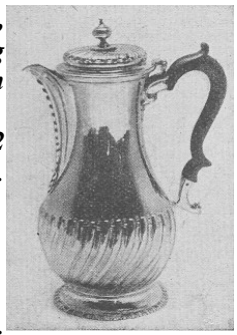
distinguish it from divorce e vinculis matrimonii (from the bonds of matrimony). A judicial separation may be obtained either by husband or wife on any grounds on which a petition for divorce might have been presented or for refusal to obey an order for restitution of conjugal rights. It is an absolute bar to a suit for judicial separation that the petitioner has committed adultery since the date of the marriage.

Separation orders may also be made by magistrates for adultery, cruelty, desertion, or such drunkenness or conduct as compels the wife to leave the husband. Coupled with such magistrates' orders are provisions that the husband shall pay anything up to £2 a week for his wife's maintenance. An order for judicial separation comes at once to an end if the husband and wife cohabit again. *See* Divorce; Maintenance; Separation Order.

JUG. Among the jugs sought by collectors are the chocolate jug of Queen Anne's time and the wine jug of a century or more later, both types being fitted with lids. These jugs are usually of silver, but they were also made in Sheffield plate.

Two beautiful examples are illustrated, the first being a silver vase-shaped jug in an Adam design, and the second a Sheffield plate chocolate jug. These shapes are frequently reproduced to-day for hot milk jugs. In the chocolate jug shown in the illustration, the knob in the centre of the lid is removable, thus enabling the contents of the jug to be stirred without being cooled by exposure to the air.





Jug. Left, silver jug with London hallmark, 1777-8, 12 in. high. Right, Sheffield plate chocolate jug, 1772. (Left. Victoria & Albert Museum, S. Kensington; right, courtesy of Chapell & Mantell. Ltd.)

Some of the antique silver jugs copied to-day stand on three feet, while others have one circular base. Some of them are finely chased with scrollwork and other decorative features, including beading and gadroon. A form of jug much sought after by collectors is the Toby jug. Old lustre jugs are also valued. Antique brass, copper, or pottery ewers and pitchers form decorative vases for flowers. *See* Cream Jug; Crockery; Glass. Pewter; Sheffield Plate; Silver; Toby Jug.

JUICE. This is the name given to the liquid part of fruits, and also of vegetables and meats. Juice is extracted from fruit in the making of jellies, drinks, syrups, sweets, etc., and also, as is the case with lemons and oranges, for flavouring purposes. *See* Apple; Beef; Lemon, etc.

JUMBLE CAKE. These small cakes can be flavoured in a number of ways. To make some, cream together 2 oz. butter and 3 oz. sugar, then beat in an egg and add the strained juice and rind of half a lemon. This is then thoroughly mixed with 8 oz. sifted flour. Turn the dough on to a floured board, and roll it out lightly to a thickness of not more than half an inch. Cut it into fancy shapes, and take in a moderate oven, sprinkling the cakes over with castor sugar when they are done. Instead of lemon, orange might be used as a flavouring. Candied peel, chopped almonds, caraway seeds, or spice are also alternatives that would give a pleasing variety.

JUMBLE SALE. A jumble or rummage sale is a practical and popular way of raising money for charity. Notice should be given some little time beforehand, say a month, or at least a fortnight, in order that the wealthier members of the community may collect such things as they feel disposed to send. These need not be confined to clothes; almost any discarded article, especially in the way of usable household goods and linen are saleable. If possible, it should also be arranged that all contributions will be called for a couple of days or so before the actual sale. Boy Scouts or Girl Guides are usually only too willing to do this, and a message or postcard from the person having articles for sale will be promptly attended to.

When all have been collected, the next task is to sort, tidy, and price the various things. The pricing should be as low as possible. It must be remembered that the sale involves no initial expenditure, but that every penny taken is clear profit; also, that besides bringing in money for whatever charity fund is concerned, it may be a very real charity to provide poor people with good clothes for a few shillings, and will be far more appreciated than if those same clothes were given away in the ordinary haphazard fashion.

Prices should be clearly marked on tickets and either sewn or gummed on the articles for sale. As far as possible, the garments should be arranged in stalls according to their nature; if there is a large assortment of other things they may be divided into classes or put together on a variety stall.

The sale should be fixed for a day when it is thought that most of the poorer women will be able to attend—probably the local early closing day will suggest itself—and should be open from the early afternoon until 8 or 9 p.m. Many people prefer to hire a hall for the occasion, but a jumble sale can be held very successfully in a large loft or outhouse if there are no suitable rooms in the house.

JUNE BERRY. This is the common name of a beautiful small flowering tree, Amelanchier canadensis. It reaches a height of 15 feet or more, has white blossom in April and May, and autumn-tinted

(Continued in page 1175)

JULY

What to do in the Garden

Flowers

Plant the bulbs of meadow saffron, autumn crocus and the Belladonna lily and the corms of autumn-flowering hardy cyclamen

Bud rose trees on briar stocks planted in the previous autumn or winter

Layer clematis, rambler rose and other shrubs

Save seeds of lupin, delphinium, geum, and other flowers and sow as soon as they are ready

Take cuttings of snapdragon, pansy, mauve catmint, and pink

Sow winter flowering stocks for the greenhouse

Sow seeds of hollyhock, gaillardia, musk, snapdragon, viola, and pansy

Layer the shoots of border carnations

Stake and tie dahlias securely

Keep carpet bedding plants nipped down closely

Cleanse and paint interiors of houses

Fruit

Layer strawberries to ensure well rooted runners for planting in August

Destroy American blight by means of a brush dipped in linseed oil

Cut out and burn branches of plum trees attacked by silver leaf.

Summer prune apple, pear, cherry, and plum trees

Prune raspberries as soon as the fruits are gathered

Vegetables

Finish planting celery and leek

Sow turnip seed to provide roots in autumn

Finish the planting of winter greens

Make the first sowing of spring cabbage

Sow seeds of early carrot to provide small roots in autumn

Cut mint and other herbs for drying

Food in Season

Fish

Bass; bream; brill; carp; dory; eel; flounder; gurnet; haddock; hake; halibut; herring; mackerel; mullet (grey and red); perch; pike; plaice; salmon; shad; soles; tench; trout; turbot; whitebait; whiting

Shellfish

Crabs; crayfish; lobster; prawns; shrimps

Meat

Beef; lamb; mutton; veal; venison

Poultry & Game

Capons; chickens; ducklings; fowls; goslings; hares; ortolans; pigeons; pullets; quails; rabbits; ruffs and reeves; turkey poults; wheatears

Vegetables

Artichokes (globe); asparagus; aubergine; beetroot; broad beans; broccoli; cabbage; carrots; cauliflower; chervil; cress; cucumber; endive; French beans; horseradish; leek; lettuce; mushrooms; onion; parsnips; peas; potatoes; scarlet runners; spinach; tomatoes; turnips; vegetable marrow; watercress

Fruit

Apples; apricots; bananas; cherries; currants (red, white, and black); figs; gooseberries; grapes; melons; nectarines; oranges; peaches; pears; pineapple; plums; raspberries; rhubarb; strawberries

Notes for the Month

JULY 1.—Dominion Day, Canada
JULY 4.—Independence Day, U.S.A.
JULY 15.—St. Swithun's Day.

JUNE

What to do in the Garden

Flowers

Cut off faded flowers to ensure a prolonged display

Water the garden in the evening during hot dry weather

Spray plants with insecticide to destroy pests

Hoe the soil frequently to keep down weeds and promote growth

Take cuttings of pink, arabis, yellow alyssum, evergreen candytuft, and other rock plants

Cut back vigorous rock plants which have passed out of bloom

Pot chrysanthemums in large pots for autumn blooms under glass

Remove the faded blooms from rhododendron

Prune the flowering currant, weigela, and mock orange when the blossoms are over.

If necessary, lift spring flowering bulbs when the leaves have died down.

Cut rose blooms with long stems to ensure fresh strong shoots which will flower later

Place azalea and other spring shrubs in pots out of doors for the summer

Stake and tie herbaceous plants

Keep surplus bedding plants ready for making good failures

Thin out shoots of tall-growing herbaceous plants

Fruit

Spray fruit trees frequently to keep down pests

Layer strawberries to provide plants in pots for forcing

Water fruit trees on walls in hot, dry weather

Pull up surplus raspberry suckers

Ventilate the vinery freely in hot weather

Mulch newly planted fruit trees with manure

Vegetables

Plant winter greens, celery and leek

Cease cutting asparagus

Plant tomatoes on a warm border or against a sunny wall or fence

Make a final sowing of French beans and dwarf early peas

Sow endive, turnip, globe beetroot, and an early variety of carrot

Food in Season

Fish

Bass; bream; brill; dory; eel; flounder; gurnet; haddock; hake; halibut; herring; mackerel; mullet; perch (after 15th); plaice; salmon; shad; sole; tench; trout; turbot; whitebait; whiting

Shellfish

Crabs; crayfish; lobster; prawns; shrimps

Meat

Beef; lamb; mutton; veal; venison

Poultry & Game

Capons; chickens; ducks and ducklings; fowls; guinea-fowls; goslings; hares; hazel hens; ortolans; pigeons; pullets; quails; rabbits; ruffs and reeves; turkey poults; wheatears

Vegetables

Asparagus; artichokes (globe); beans (broad and French); beetroot; cabbage; cardoons; carrots; cauliflower; chervil; cress; cucumber; endive; horseradish; leeks; lettuce; mushrooms; onions; parsnips; peas; potatoes (new); radishes; seakale; sorrel; spinach; tomatoes; turnips; watercress

Fruit

Apples; apricots; bananas; cherries; currants; gooseberries; grapes; lemons; melons; nectarines; oranges; peaches; pears; pineapple; raspberries; rhubarb; strawberries

Notes for the Month

JUNE 16.—Close season for fresh-water fish ends
JUNE 24.—Midsummer Day; Quarter Day

leaves. It thrives in ordinary soil and can be increased by seeds. A variety named oblongifolia grows only 5 or 6 feet high and bears white flowers freely in spring.



June Berry. White spring flowers of this beautiful small tree.

JUNIPER. The juniper is a most important family of hardy evergreen shrubs and trees of many habits and ranging from 1 ft. to 40 ft in height. They are particularly useful as lawn trees and in shrubberies, while lovers of the rock garden should take special note of the dwarf varieties.

The junipers thrive particularly well in chalky soil, and are propagated by cuttings taken in late summer and inserted in a frame. The plants may also be raised from seed. One of the best for general planting is the Chinese juniper (Juniperus chinensis); aurea, with golden leaves, and Fortunei, with grey-green leaves, are attractive varieties.



Juniper. Specimen of the silvery leaved Chinese Juniper (chinensis), effective either in the shrubbery or in a large rock garden.

The common juniper (communis) is a spreading bush or small tree, but the variety hibernica (Irish Juniper), of slender column-like form, is a particularly graceful tree. The dwarf variety, hibernica compressa, is one of the most popular miniature conifers for the rock garden. The red cedar or American juniper (virginiana), which provides wood used in the manufacture of lead pencils, is an attractive tall tree; the silvery-leaved variety glauca is beautiful.

JUNKET. This dish is made in the following way: Heat a pint of new milk to about 98° F., which is its natural heat. Then pour it into a dish and add a dessertspoonful of white sugar and 2 teaspoonfuls of essence of rennet. After this let it set, the time needed for this being from 1½ to 2 hours. When it is set, sprinkle it with powdered nutmeg, and then cover it with a layer of clotted or whipped cream.

The rennet for making the junket can be obtained in tablet or powdered form. In the latter case it is sold under the name of junket powder, and directions as to the quantities required are printed on the packet. The powder is sometimes preferred to the liquid rennet because the latter varies in strength, more being needed to turn the milk at one time than another, as climatic and other conditions vary.

If the milk does not solidify with the first addition of rennet or junket powder it can be reheated and more powder or rennet added. A pinch of salt should always be added. The milk used for junket should be perfectly fresh and sweet; if there is the least suspicion of sourness it will not clot, but form into flaky curds. The milk should not be diluted with water, nor fruit juice used for flavouring. Spirits or highly concentrated essences should be used for this purpose, but only sparingly, so that they will not have a curdling effect on the milk.

For flavouring junket brandy is often used, but either whisky or rum makes a good substitute, while on the top cinnamon may take the place of nutmeg. If spirits are not liked, some such flavouring as vanilla or almond essence can be employed. It may be left to set in a room of ordinary or even warm temperature, a cool place such as is required for jelly being unnecessary and unsuitable. A bowl of junket must be handled carefully, as it separates at once if shaken. It makes a light and nourishing dish at all times, but is especially suitable for invalids who cannot eat solid foods. *See* Clotted Cream; Invalid Cookery; Rennit.

JURY: Liability to Serve. With certain exceptions, men and women who are qualified as householders or property owners are bound to serve upon a jury if called upon to do so. Men liable are those between the ages of 21 and 60 who possess land of the clear value of £10 per annum, or who are assessed in the valuation list for a house valued at not less than £30 in Middlesex and £20 elsewhere. Women who possess the same qualifications are liable, but husband and wife must not serve on the same jury. The names of jurors are taken from the lists of voters. The chief classes exempted from this duty are peers, members of Parliament, judges, clergymen, lawyers, doctors, officers of the army, navy, and air forces and Territorial Army, and chemists.

When a jury is required the sheriff or clerk of the peace chooses the names from the list of persons liable and sends by post notices to them. This must be done at least six days previous to the meeting of the court. Jurymen are required for assizes and quarter sessions, and also in London for the sittings of the central criminal court and for certain civil actions heard at the law courts. It is usual to summon more persons than are required, and if the reasons given are deemed adequate a man called can be excused from service. Jury men who fail to attend the court on the appointed day can be fined. They are not paid, except that small fees are given to common jurors and to members of coroner's juries. In some cases refreshments are provided at the expense of the sheriff.

Juries are either grand, petty, coroner's, special, or common. A special jury is one called to hear certain civil actions. Special jurors are taken from those who occupy houses above a certain rental value, usually about £60 a year. Juries in Scotland and Ireland are similar to those in England, although in Scotland the methods of procedure are somewhat different; for

instance, there are no coroners, and hence there can be no coroner's jury.

Women on Juries. By the Sex Disqualification (Removal) Act, 1919, women are enabled and bound when summoned to sit on juries. The presiding judge may, however, either at his own instance or on an application made by one of the parties, order that the jury shall be composed of men only, or of women only. A woman may also apply to be excused from serving on a jury in a particular case, and if the nature of the evidence to be given or the issues to be tried make it reasonable that she shall be exempted the judge may exempt her if he thinks fit to do so.

If a woman who receives a jury summons is pregnant, or suffering from some feminine condition or ailment, she should apply to the summoning officer or the under-sheriff, enclosing a medical certificate, and asking to be excused from attendance. This should be done within three days after the jury summons has been received.

JUVENILE OFFENDER. In English law a juvenile offender is one who is under the age of 17 years. When a person apparently under that age is arrested, the police superintendent or inspector must let him out on bail, unless the offence is homicide or some other grave crime, or unless it is in the interests of the offender to remove him from some reputed criminal with whom he is associating. If he is not released on bail he must not be put in a prison but in some other place of detention until his case can be dealt with. The object of these provisions is to prevent juveniles from being exposed to the risk of contamination from older criminals.

Juvenile Courts. Special courts are held for the trial of juveniles. They may or may not be held in the ordinary police courts but if they are, they must be held at different times from ordinary sittings; and from these courts all are excluded except persons connected with the case and bona fide pressmen. Juveniles are not to be mixed up with ordinary prisoners. In London the Home Secretary appoints for each juvenile court, to assist the regular police, magistrate, two other justices one of whom must be a woman.

In dealing with juvenile offenders, the powers of punishment are restricted. No juvenile can be sentenced to death or penal servitude. He may be whipped or sent to a reformatory or industrial school, or he or his parents may be fined, or he may be handed over to the care of a welfare missionary, or his parents may be bound over to see that he behaves himself for the future. He cannot, however, be sent to prison in default of paying a fine or the costs of the trial, as an adult can. The power that the courts have of fining parents for the offence of a child is the only instance of vicarious punishment known to the English criminal law.

A child under 14 cannot be sentenced to imprisonment, but for certain grave offences may be ordered to be detained for a period such as would formerly have been the period of imprisonment. If convicted of murder, a juvenile may be ordered to be detained during his Majesty's pleasure. If a juvenile is ordered to be detained, the court may make an order that his parent or putative father shall contribute to his maintenance. *See* Child.

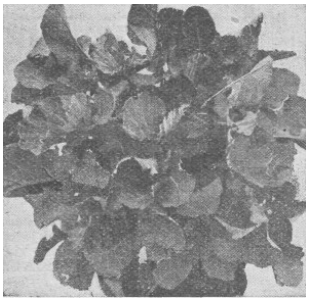
KAFFIR LILY. The bulbous-rooted perennial plant known as Kaffir lily, or winter gladiolus (Schizostylis coccinea), has long, iris-like leaves, and scarlet flowers on a tall spike in early autumn. It is not very hardy and is generally grown outside in a sunny sheltered position, in a compost of loam, leaf-mould and sand. The bulbs, or rhizomes, may also be placed in pots in early spring. After being established in the cool house or frame they may be stood out of doors during the summer months and taken in for an autumn display inside. Propagation is by division in spring. There is a beautiful pink variety named Mrs. Hegarty.



Kaffir Lily. Scarlet blooms and iris-like leaves of the winter gladiolus.

KALANCHOE. These are greenhouse perennial flowering plants with thick fleshy leaves. The best are Kalanchoe flammea from Somaliland, which bears scarlet flowers in summer; and Blossfeldiana, cerise. They should be potted in sandy loam and kept safe from frost. Propagation is by cuttings.

KALE. Of this hardy and useful green winter vegetable there are many varieties, e.g. cottager's, asparagus, curled and Drumhead. Seeds are sown out of doors in April, and the seedlings are planted out in summer at about 2 ft. apart. *See* Curly Kale.



Kale. Fine head of a variety of this green vegetable known as asparagus kale.

KALMIA. These beautiful hardy evergreen flowering shrubs thrive in peaty or lime-free loamy soil. The best is kalmia latifolia, the calico bush, which grows 3 to 5 ft. high and bears pale rose coloured flowers in early summer. Glauca 18-24 in., and angustifolia, 2-3 ft., both have rose coloured blooms. An important detail of cultivation is to remove the faded flowers to prevent the development of seeds. These shrubs are propagated by seeds, though the seedlings grow slowly.

KALOSANTHES. This greenhouse plant, which is classed as a succulent because of its thick fleshy

leaves and stems, is not very commonly grown, but one species, Kalosanthes (crassula) coccinea is very showy. It grows about 20 in. high and bears clusters of scarlet tube-shaped flowers in summer. It should be potted in a compost of loam and sand and during winter needs a temperature of 45 to 50 degrees. Propagation is by cuttings in summer. Kalosanthes lactea bears white flowers in winter.

KAPOK. The vegetable down obtained from the thistle and other plants, and used for stuffing cushions, pillows, etc., is known as kapok. *See* Down.

KAULFUSSIA (Cape Aster). This is a pretty hardy annual from South Africa, which grows 6 in. high and bears small daisy-like blue, white or crimson flowers, according to the variety chosen. It is suitable for sowing as an edging. From seeds sown out of doors in April the plants bloom in summer.

KEDGEREE. This is an Indian dish prepared mainly from rice and fish. To make it, melt 1 oz. of butter in a stewpan and add to it ½ lb. of boiled rice, ½ Ib. of any cold cooked fish broken into flakes, and the coarsely chopped whites of 2 hard-boiled eggs. Season the whole with salt and pepper to taste, make it thoroughly hot, and then pile it up on a hot dish. Garnish the kedgeree with the yolks of eggs rubbed through a sieve, and some chopped parsley.

KEESHOND. Breed of dog, popularly known as the Dutch Barge dog. In some respects the Barge dog is similar to the pomeranian, chiefly differing in size and colour. The colour should be like that of the wolf, namely fawn, either light or dark, the long hairs being tipped with black, but the colour on the muzzle, around the lips and on the legs and tail are of a lighter shade. The coat should be very profuse excepting on the head, ears, and front parts of the fore and hind legs where it is smooth. The ears are erect, eyes dark, with a foxy expression, and the head of fox-like conformation. The body should be short and compact, the chest deep, and the tail carried over the back like a plume. The keeshond is about 18 in. in height, and makes an excellent companion as well as a good watch dog. It is a distinctly hardy breed.



Keeshond. Specimen of this excellent breed of dog, closely resembling a Pomeranian.

KENNEDYA. This greenhouse climbing plant bears pea-shaped flowers in spring or summer. The favourite kind is Kennedya comptoniana, with purplish blooms in spring. Another is Marryattae, which bears scarlet flowers in summer. These plants, which are not often grown nowadays, thrive in large pots filled with sandy loam and need a minimum temperature of about 50 degrees. Pruning should be done after flowering.

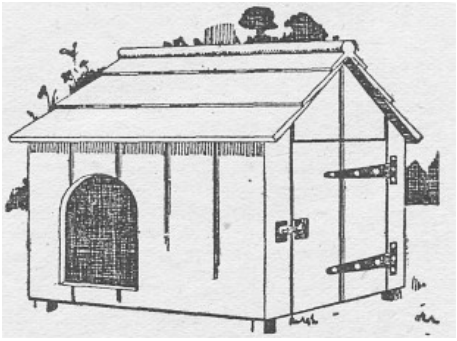
KENNELS AND THEIR CONSTRUCTION

How to Provide Accommodation for the Watchdog

This article suggests a reference to the entry on Dogs, and also to those on the various breeds of dog, e.g. Bloodhound; Spaniel; Terrier. See also the entries on the materials used in the making of a kennel, e.g. Board; Hinge; also Amateur Carpentry; Concrete; Shed.

Kennels are of several kinds, but certain general principles are common to all. All alike should possess roominess and warmth and accessibility, the last mentioned quality being necessary in order that the kennel may be cleaned, as it should be, at least once a week. Attention should be paid to the situation of the door, in order that the dog may escape draughts, while, if possible, a south or south-western aspect should be selected. More necessary perhaps is it that the ground should be dry, for damp is very favourable to disease. Sunshine, fresh air, adequate drainage, and good ventilation are as desirable in the case of kennels as they are in that of houses.

If it is necessary to confine the inmate in the daytime, on no account put him on a chain. A small run can be attached to his kennel, either of railings which are sold for the purpose, or very stout wire netting fixed to posts. Bedding may consist of straw, pine shavings, or sawdust. The latter is a good thing for long-coated animals in winter-time, because of the manner in which it will absorb the wet. The ideal arrangement would be to have an inner sleeping compartment bedded with straw, and an outer compartment littered deeply with sawdust.



Kennel. Fig. 1. Wooden kennel suitable for a terrier or other dog of medium size.

Making a Kennel. The kennel shown in Fig. 1 is suitable for a terrier or similar dog. Elevations with suitable dimensions are shown at Figs. 2 and 3, and details of the framework at Fig. 4. Deal is a suitable wood to use throughout.

The corner posts (A) are 2 in. square, and the side and end rails (B and C) 1½ in. square. The rails may be tenoned into the posts, as in Fig. 5, or lapped, as in

(Continued in page 1179)

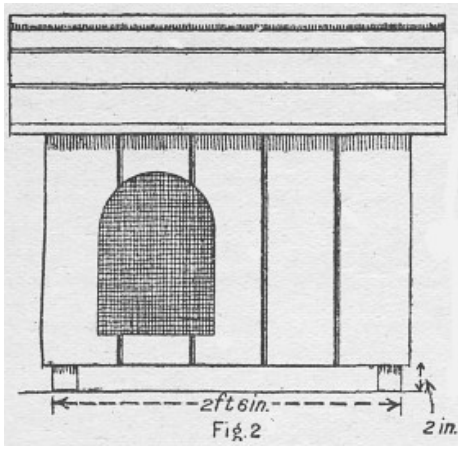


Fig. 2

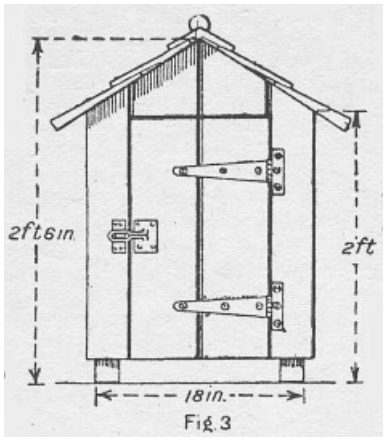
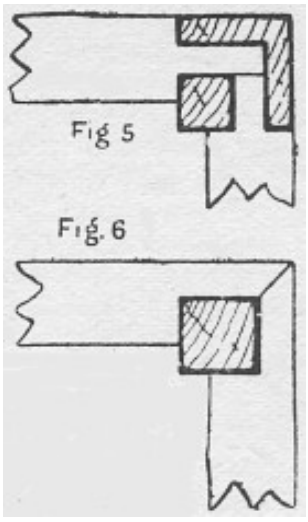


Fig. 3



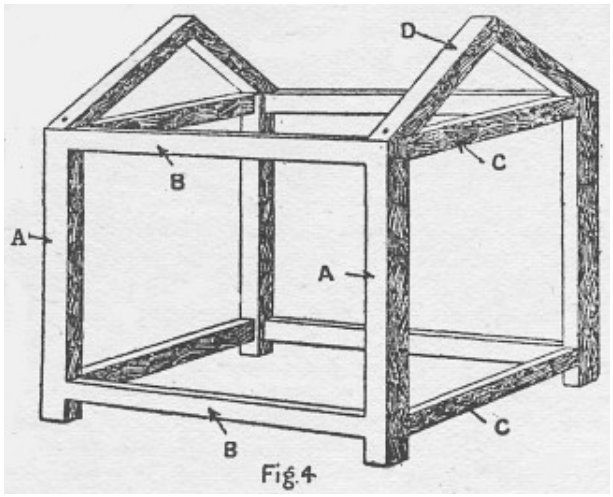
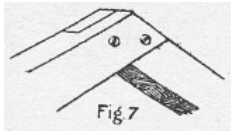
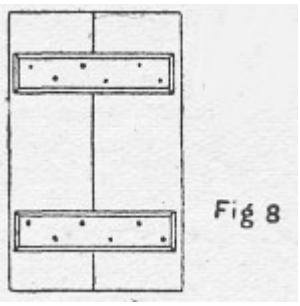
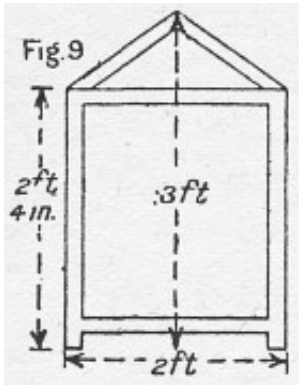
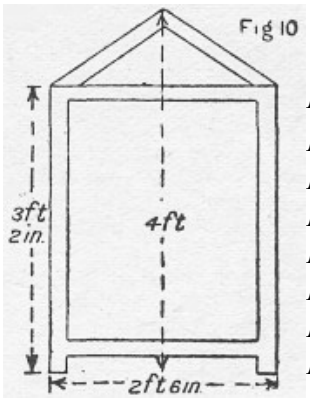


Fig. 4









KENNEL

Fig. 2. Side elevation.
Fig. 3. End elevation.
Fig. 4. Framework.
Fig. 5. Mortise and tenon joints in corner post.
Fig. 6. Simpler method of securing rails.
Fig. 7. Half-lapped joint for rafters.
Fig. 8. Door strengthened with battens.
Figs. 9 and 10. End sections of kennels suitable for larger dogs.

Fig. 6. The joints in either case should be painted before fixing, the tenons being secured with wood pins, or the lapped joints with screws. The rafters (D) are 1½ in. square, half lapped together (Fig. 7) and nailed or screwed to the framing. It will be a good plan to paint the framework before fitting the bottom or covering the side and roof.

The bottom is of ¾ in. grooved and tongued matchboard, fitted around the corner posts, and nailed to the top edges of the bottom rails. The sides and ends are covered with similar boards. An entrance is arranged at one side, being about 1 ft. 2 in. high by 10 in. wide. It will be convenient for cleaning purposes to have a door at one end. The door should be battened together, as shown at Fig. 8, and hung with a pair of long flap hinges. The boarding above the door opening should finish in the middle of the top rail, so that the top edge of the door may shut against this rail as well as against the bottom rail. Weather boards are very suitable for covering the roof. They should overhang 3 in. all round, and the roof is finished with a ridge roll at the top. The kennel should be painted with three coats, or treated with a preservative.

For a retriever or similar dog the kennel should be 3 ft. 3 in. long, and of the section shown at Fig. 8, while for a still larger dog, such as a St. Bernard, the length should be 4 ft., with a section similar to Fig. 10. Their construction will be similar to that already described, only the framing and boarding may be stouter to correspond with the increase in size, and it may be advisable to add a couple of rafters across the middle of the roof.

KENTIA. This graceful palm is suitable for a heated greenhouse. It may also be grown in a room window during the summer months. Belmoreana and fosteriana are the favourite kinds, the former being less vigorous than the latter and better suited to cultivation in small pots. A compost of loam, peat, and sand suits these palms, which need a minimum temperature of 50-55 degrees in winter.

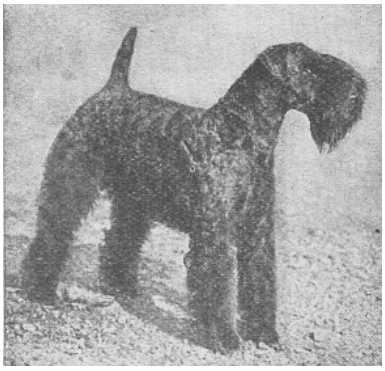
KEPHIR. This is a form of fermented milk, like koumiss. To make fermented milk, put boiled cow's milk into strong pint bottles, leaving a small part empty; add ¼ oz. of white sugar and a small piece of yeast about the size of two peas to each bottle. Cork, wire, and place the bottles on their sides. Shake them every morning and every evening. The milk will be ready for use in a week. *See* Milk.

Kerosene. This name is used for the oil obtained from bituminous coal and petroleum. It is used for lamps. *See* Lamp; Oil.

Kerria. Alternative name for the shrub better known as Jew's Mallow (q.v.).

KERRY BLUE TERRIER. In size this terrier stands midway between the red Irish terrier and the Airedale. They are rugged fellows with a shaggy, soft coat and dark, intelligent eyes.

They have a reputation for high courage in tackling vermin and are devoted guards. With children they are said to be very gentle, and they are capable of retrieving or scenting a wounded hare or bird. At present the term blue applied to this terrier admits of a liberal interpretation, the colour appearing in various gradations. *See* Dog.



Kerry Blue Terrier. Princeton Hell-of-a-Fellow, champion of this shaggy-haired breed. (Photo, Thos. Fall)

KERSEY. One of the earliest woollen-fabrics made in England, kersey is coarse-spun, like blanket and twill-woven, and usually white or checked. Kerseys are used for horsecloths. Cheap kersey cloths are used for floor scouring.

KETCHUP. Ketchup is a sauce made from mushrooms, walnuts or cucumbers.

Mushroom Ketchup. To make mushroom ketchup, gather the mushrooms before the sun has discoloured them, and break them very small into a basin. Sprinkle them with salt and let them stand 3 days; then boil and strain them. They must be simmered till all the juice is out. After straining boil up the liquor again with the whites of 1 or 2 eggs to fine it, and then strain. Return the liquor to the fire, adding to every quart of juice 6 shallots, ¼ oz. whole black pepper, ¼ oz. ginger, 1 tablespoonful grated horse-radish, 6 or 8 allspice, and 1 laurel leaf. Simmer about ¾ hour; then skim and strain into bottles and cork them well.

Cucumber Ketchup. To make cucumber ketchup, pare the cucumbers and slice them as thinly as possible into an earthenware bowl and cover them thickly with salt. Cover closely and let them stand until the following day; then strain the liquor into a stewpan. To every pint of liquor add ½ pint of white wine vinegar and a teaspoonful of peppercorns, and simmer gently for from 20 minutes to ½ hour. Then allow it to go cold, strain it into bottles, cork it tightly and store in a cool, dry place.

Walnut Ketchup. For walnut ketchup the walnuts must be very young, green and tender. To every 100 walnuts allow one quart vinegar, 3 oz. salt, 4 oz. anchovies, 12 chopped shallots, ½ stick grated horse-radish, ½ teaspoonful each of mace, nutmeg, ground ginger, ground cloves and pepper and a pint of red wine. Bruise the walnuts slightly, put them into a jar

with salt and vinegar and let them stand for 8 days, stirring them daily. Drain the liquor into a stewpan, add to it the rest of ingredients and simmer very gently for 40 minutes. When cold, strain into bottles, cork and store in a cool, dry place.

KETTLE: Choice and Care. Kettles are made in tin, aluminium and copper and enamelled ware, while more ornamental ones are in silver, electro-plate and brass. The latter, however, are only for use with a small spirit stove, not for the ordinary task of boiling water on a fire. Kettles of aluminium, tin or block tin are the cheapest and for kitchen purposes most suitable. They can be bought to hold 2, 3, 4, 5, 6 or 8 pints, or even more. Copper kettles are more expensive, but their durability is much greater. Some kettles are fitted with wooden handles, which do not get as hot as the metal ones. Others in aluminium are fitted with patent insulated iron handles always cool to the touch.

An aluminium kettle is provided with a cup which fits over the kettle top and can be used to poach an egg in the steam. Another kettle is obtainable with a grooved base so that it forms a lid to a saucepan and serves a dual purpose. Square kettles in aluminium economise space and gas on a gas cooker if used in conjunction with square saucepans. Both kettle and saucepan can be packed neatly together over one burner and no heat escapes between them to be wasted. Absolutely flat bottomed kettles are made for use on electric cookers.

Another kettle is made to hang on a stand, with a heating apparatus in the form of a small spirit stove, while another rests upon a small oil stove. A kettle with folding handle is made for the use of travellers and picnic parties, some of these having a corrugated bottom as an aid to boiling. Bronchitis and fish kettles are amongst those which are made for particular purposes.

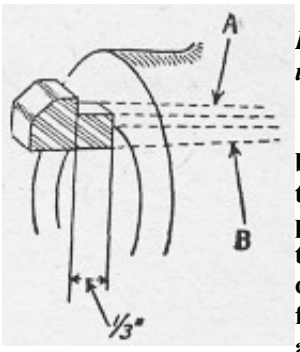
Kettles of enamelled ware should be of good quality, for the cheaper makes are apt to chip and to become a source of danger when used for heating drinking water. They may be washed in hot soapy water, and, in case of stains, cleaned in the same way as other enamelled goods. Electric kettles fitted with a heating apparatus and a cord for connecting with the electric wires can be used in any room containing a plug or lamp holder. They have many advantages, among these being the fact that they are easily kept clean, and their contents may be heated on the tea-table itself and kept hot throughout the meal.

Kettleholders. These may be made of almost any non-conducting material, from the asbestos ones, which can be bought at most ironmongers, to pieces of serge or woollen cloth from the scrap-bag. Among the most popular are those worked in cross-stitch with bright coloured wools.

Unless at least three thicknesses of material are allowed, the kettleholder will not serve its purpose efficiently. A small loop at one corner is useful, as the kettleholder can then be hung up on a hook by the stove; 6 in. sq. is a satisfactory size for such an article.

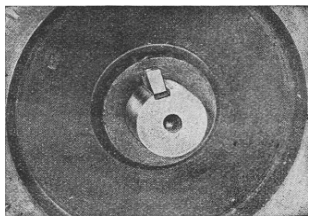
S e e Brass; Bronchitis Kettle; Electricity; Kitchen; Silver; Soldering; Tin.

KEY: In Engineering. This is the name given to the specially shaped piece of cast steel that is fitted into keyways cut to receive it on the shaft and the part that is to be mounted on the shaft and secured from turning. The key shown in Fig. 1 is the type commonly used in general engineering. To fit this pattern the outer part is first driven home on the shaft with the keyways dead in line, and the key cut very slightly taper from the head on the faces marked *a* and *b.* This taper will be cut to correspond to the amount of taper already given to the keyways. The key when driven home with the hammer should protrude from the shaft, as shown, by not less than ⅛ in. This point is essential, if trouble is to be avoided when removing the key.



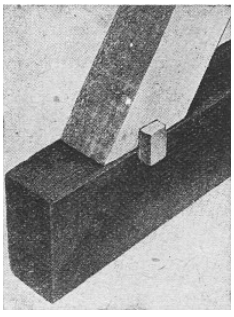
Key. Type of key commonly used in general engineering.

If a key is allowed to become slack, movement will take place between the outer part and the shaft, which, through friction, will very quickly destroy the smooth faces of each, making repair a costly matter. Fig. 2 shows a key properly fitted to a keyway in a shaft, securing a flywheel.



Key: in Engineering. Fig. 2. Close-up view of a key fitted to a keyway in a shaft, showing how it fits closely into the boss of the flywheel.

KEY: In Woodwork. In joinery and woodwork, keys of various kinds are used in different varieties of joints, some of which are referred to under separate headings, but in general a key in joinery is a piece of wood which fits into a dovetailed groove to allow the framing to shrink but prevent it warping. A keyed beam is one that is built up similarly to an indented beam, but provided with keys in place of the indents. Keyed mitred joints are those which are strengthened by inserting thin strips of wood called keys into saw-cuts or grooves cut across the mitre. They may take the form of thin strips converging so as to form a kind of dovetail, or a thick piece known as a false tenon.



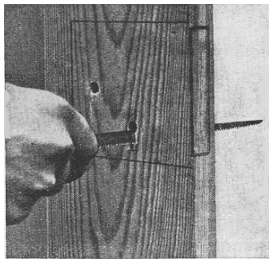
Key: in Woodwork. Showing a keyed joint in carpentry suitable for thin trusses in small roofs.

A keyed joint in carpentry suitable for thin trusses in small roofs is illustrated below; it shows a rafter keyed to a beam. The key is simply a piece of hardwood accurately fitted into slots cut in the meeting faces of the beams, which are usually further held together by a bolt or strap. *See* Joint.
Key-cutting. *See* Lock.

KEYHOLE: How to Cut. This operation can easily and quickly be done with the aid of a small brace and bit and a keyhole saw. The correct position for the keyhole should be found, this being done by placing the lock-case in position against the door, and passing a scriber or other convenient article through the keyhole in the lock-case, and marking its outline on the woodwork of the door.

Having obtained the correct position of the keyhole, the next thing is to bore a hole of a sufficient diameter to admit the keyhole saw. All that is now required is to cut around the marked outline with the saw. Generally the keyhole is covered by an escutcheon, that is, a metal flap, hinged to the wood or metal work, over the head of the keyhole, so arranged that it can either be lifted up or, as is more generally the case, pushed on one side. This should prevent draughts passing through the keyhole. *See* Door; Lock.

Keyhole Saw. This tool is specially adapted for the cutting of keyholes in wood. It comprises a narrow tapered saw with fairly fine teeth with considerable set, to ensure freedom in cutting to the various patterns. A wood or metal handle is used, the former being slotted to allow the saw blade to pass down through it. The blade is secured by set screws in the ferrule. The saw illustrated has a metal handle made of malleable iron and provided with two clamps for holding the saw perfectly square. Spare blades or blades of different lengths and fineness of teeth are procurable.



Keyhole Saw, a tool special-ly adapted for cutting a keyhole in a wooden door, and other purposes.

In using the keyhole saw it is necessary to push the saw perfectly in line with the blade, otherwise it is very liable to buckle or break. Too much pressure must not be put on the saw for the same reason, but if these two points are borne in mind the keyhole saw will be found extremely useful for cutting out all manner of shapes in wood up to about 1 in. in thickness. In ordinary work a hole is bored, through which the saw may be passed, and the various shaped portions sawn away.

When working, it is particularly necessary to see that the saw-blade be kept at right angles to the face of the work, otherwise the edges will be tapered and badly shaped. This saw can be sharpened and set in the ordinary way. *See* Saw.

KID: Its Uses. A light kind of leather used for gloves, shoes, and fancy articles, kid is prepared either from goat or sheep skin.

Thorough wetting in water shrinks kid. Certain kinds of heavy kid gloves are sold as washable, but it is safer merely to sponge the surface while the gloves are on the hands. Special glove soap can be used on the sponge. After being semi-dried by rubbing with a soft cloth, sponged gloves should be taken off and left to dry slowly in the air. Rust and ink stains on kid can be removed with oxalic acid applied with a flannel. *See* Glove.

KIDNEY: In Cookery. Both sheep's and calf's kidneys can be cooked separately and according to the same directions. Sheep's kidneys, either grilled or stewed, are a favourite breakfast dish, and are also made into curries, pies, etc., while ox kidneys are used mainly for soup-making and stewing. Pig's kidneys may be broiled in the same way as sheep's kidneys, but will require more time.

To prepare grilled kidneys and bacon, remove the rind and lightly fry 6 rashers of bacon. Then put them on a dish in the oven to keep hot while the kidneys are being cooked. Skin and cut 3 sheep's kidneys into halves, and remove the cores, place them in the pan with the cut side down, and cook them gently, turning them once. Dish the bacon, putting half a kidney on each piece; season and place a small lump of butter on each.

Stewed kidney and bacon are prepared from the following ingredients: 1 lb. ox kidney, 3 oz. fat bacon, 2 small onions, ½ oz. flour, a seasoning of pepper and salt, and ½ pint water.

Cut up the kidney and wash it well. Place it in a saucepan with the bacon cut into slices, the water, and the sliced onions. Simmer all gently for two hours. Mix the flour, salt and pepper to a thin paste with 2 tablespoonfuls of cold water and add them carefully to the stew, stirring all the while. Boil up the whole, cook it for 5 min., and then serve.

Macaroni and Kidneys. Kidneys and macaroni make another savoury dish. Skin and halve 4 sheep's kidneys, sprinkle them with salt, jaepper, and powdered herbs, and then fry ffiem in a pan containing 2 oz. of butter. When they are cooked on both sides, pour off a little of the butter and add ½ pint of tomato sauce to what remains in the pan. Heat the whole thoroughly; then turn it on to a hot dish and garnish it with a border of boiled macaroni cut into pieces an inch long. On each kidney place a quarter of a hard-boiled egg, and just before serving dust over the whole some grated cheese.

Mushrooms and Kidneys. Melt ½ oz. of butter in a saucepan, stirring in 3 level teaspoonfuls of flour, and then adding ½ pint of stock. Stir the whole until it boils; then add 2 teaspoonfuls of chopped ham, 2 teaspoonfuls of chopped mushrooms, and a teaspoonful

each of mushroom ketchup and chopped parsley. Mix these well, add seasoning to taste, and then 2 sliced tomatoes. Cook the whole gently for 5 min., and in the meantime skin, halve, and grill 4 sheep's kidneys. Add them, and then reheat the contents of the pan, but do not let them boil. Turn the whole on to a hot dish with sippets of fried bread.

Kidney Cassolette. Cassolettes of kidney may be prepared by cooking 2 sliced sheep's kidneys in a little melted butter, adding a finely chopped shallot and a few button mushrooms cut into small pieces. When they have been allowed to fry for a few minutes, add a small teacupful of any good brown sauce and a little sherry. Cook the mixture slowly for 20-30 min., season it, and heap it into some small batter cases for serving.

Kidney Croquette. Croquettes of kidney and bacon are made by lightly frying 3 sheep's kidneys and 3 oz. of streaky bacon, and then chopping them finely. Melt an ounce of butter in a pan, stir in smoothly ½ oz. of flour, add ½ pint of stock, and stir all until they boil. Put in the bacon and kidney, season the mixture, and then turn it on to a plate to cool. When cold, shape it to form small corks, dip these in egg-and-breadcrumbs, and fry them a golden brown. The croquettes should then be drained on paper, and served with fried parsley and tomato sauce.

Kidney Soup. An ox kidney is used to make this soup. Wash and dry it, and cut it into small pieces, removing the fat from the centre. Dredge the pieces with flour and then put them into a pan containing 2 oz. of melted butter or margarine. Fry the kidney until it is brown, then add a large onion cut into dice, and brown that also. Pour in 3 pints of cold water or stock, bring it to the boil, skim it, and then add a carrot and a turnip, cut into dice, and some green celery tops chopped up coarsely. Simmer the whole slowly for 2 hours, then strain and return the liquor to the pan. Blend a tablespoonful of flour smoothly with a little cold water, add it to the liquor in the pan, and stir the soup until it boils. Simmer it for 5 min., season to taste, and then serve. If preferred, this may be served as a stew, with thick gravy and a border of rice or macaroni.

Kidney Toast. Either a calf's or sheep's kidney, previously cooked, may be used to make kidney toast. Mince it finely, season to taste, and then heat it up in any good brown sauce. Serve the mixture heaped on slices of hot buttered toast. If liked a little chopped parsley and shallot may be added to the mince. A few small mushrooms are also an improvement to this dish, and a little sherry to flavour. *See* Batter; Steak.

KIDNEY BEAN. Varieties of French beans, the seeds of which are shaped like kidneys, are known as kidney beans. They are cooked according to the general directions given for French beans. *See* Bean; French Bean.

KIDNEYS: Functions and Diseases. Situated one on either side of the spine, the kidneys are partly covered behind by the last ribs. Their function is removal of the nitrogenous waste products in the form of urea, uric acid, etc., and of other substances from the blood. The essential elements of the kidney are arteries to bring blood containing waste material; urinary tubules to separate this latter, together with a large quantity of water, from the blood; and veins to carry back the purified blood. While the healthy kidneys separate water, urea, uric acid and certain salts from the blood, they do not allow sugar or albumin to pass. In disease they lose this selective power, and great quantities of sugar may pass into the urine in diabetes, and large quantities of albumin in Bright's disease and other maladies. On the other hand, they may fail to remove the urea, etc., and thus give rise to symptoms of uraemia.

Abnormalities are sometimes found. There may be only one kidney, or the kidneys may be united at their lower ends, forming what is called a horseshoe kidney. In some people, and especially women, the kidneys may be more or less freely movable. This has no disagreeable effects, as a rule.

A renal calculus, or stone in the kidney, may exist for a long time without giving rise to symptoms. A dull pain in the loin is common, however, and there may be frequency in passing urine and this may contain pus and blood. Should a stone of any size pass into the ureter it gives rise to renal colic, spasms of excruciating pain which shoot down to the front of the thigh. Associated with this there is shock and vomiting. The doctor should be summoned and meanwhile the patient is placed in a hot bath for ten to twenty minutes. Failing a bath, apply hot fomentations or a large linseed poultice.

Inflammation of the kidney substance, or nephritis, is described under the heading Bright's Disease. Septic infection may involve the organs; this is called pyelo-nephritis. From such an infection an abscess may form. Tuberculous disease may affect one or both kidneys. The symptoms rather resemble those of stone in the kidney, but a proper examination of the urine will reveal the presence of tubercle bacilli. *See* Bright's Disease; Diuretic, etc.

Kidney Vetch. This is another name for the hardy herbaceous perennial better known as lady's finger (q.v.).

KILOGRAMME. This is a measure of weight in the metric or decimal system. It consists of 1,000 grammes, and is equal to 2-1/5 pounds avoirdupois. *See* Metric System.

KILOWATT. In electricity this is the name given to a unit of power. It is the commercial unit by which electricity is sold, and is the equivalent of 1,000 watt hours. *See* Electricity; Watt.

KING CHARLES SPANIEL. Although bred in the present day especially as lapdogs, the King Charles were formerly used for sporting purposes, and they still make excellent house dogs. They are very gentle and affectionate, though their demeanour to intruders may be quite the reverse.

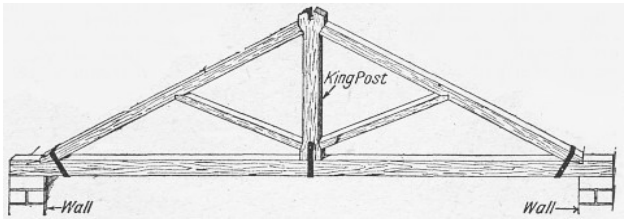
Under the name of King Charles are also included the varieties that breeders and fanciers distinguish as tricolour, Blenheim, and ruby spaniels; but the difference between them is only one of colour, and it is quite possible that one litter might comprise examples of each. The following points apply to all of these varieties.

The head has a semi-globular dome, the turned-up nose is short and broad with a black tip. The large dark eyes have horizontal lids, and are always more or less weeping. The heavily feathered ears are set low on the head, hang flat to the cheek, and reach nearly to the ground when the dog is walking. The body is compact, the back short and broad, the chest wide, the legs stout and strong. Some of these points are hidden by the long silky coat, which should be wavy, not curling. The feet, the backs of the legs, and the tail are all feathered. For show requirements the tail is docked to 4 in.



King Charles Spaniel. Specimen of the silky-coated breed of pet dog, formerly used for sport.

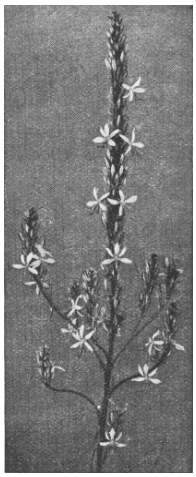
The King Charles proper is glossy black with some rich tan on the legs and below the root of the tail, also on the cheeks and over the eyes. The tricolour is white with patches of black, the inside of the ears tan, and the usual spots of that colour on the cheeks and brows. The Blenheim also is white with patches of chestnut or ruby red, and cheeks and ears red, and from nose to above the forehead a long patch of white with a clear spot of red in the upper part. *See* Dog.



King Post in domestic architecture. Centre upright in a roof truss.

KING POST. This is the centre or principal upright post in a king post roof trust, of which examples are found in many forms of domestic architecture. The roof truss comprises the horizontal member called a tie beam, which reaches from one side of the building to the other and rests upon the walls. The principal rafters are framed into this tie beam, and their upper ends abut on the top of the king post, which stands upon the tie beam. It is connected to the latter by either joints or straps. Braces are then disposed from about the middle of the rafters to the foot of the king post, with the result that when all these joints are properly constructed and then strapped together, the roof truss is a strong and rigid structure suitable for buildings with a span up to about 30 ft. *See* Roof.

KING'S SPEAR. This is a popular name applied to the giant asphodel or eremurus (q.v.) and to Asphodelus ramosus, a hardy tuberous-rooted peren-nial with narrow grass-like leaves and white summer flowers on stems 4 ft. high. Asphodelus, or asphodel, thrives in ordinary soil, and may be increased by lifting and separating the roots in spring.



King's Spear. Pink flowers of the dwarf variety imperialis.

KIPPER. Certain fish, such as herrings, salmon, or mackerel, are preserved by the process of kippering, which is carried out by splitting the fish open, salting them, and drying them in wood smoke. Most commonly the word kipper is applied to herrings.

The kippers may be cooked in the oven, or broiled in front of the fire. It improves them if they are plunged for a minute in boiling water before cooking them. If no double gridiron is at hand they may be toasted or hung in a Dutch oven. Before broiling, trim the fish, and after they are cooked rub them with butter. Another way is to put them in a casserole with a little butter or good dripping, cover them tightly and cook in a hot oven 10 to 15 min. In this way no smell of cooking escapes into the house. The same method may be used for kippered mackerel, but they will take longer. *See* Fish; Herring.

KIRMAN RUG. Persian rugs of the Kirman type can be obtained in carpet sizes. Their soft and harmonious tories, in blue, green, fawn, rose and old gold, and their naturalistic designs of bouquets and vases, show up exceptionally well with 18th century period furnishings. They should be examined for their cotton warps, their fine, closely woven and slightly lustrous woollen naps, and the rich reds and blues of their three or more border-stripes.

The design usually includes a large central medallion, sometimes scalloped. Among the devices used are the tree of life, the eight-petalled lotus, birds, gazelles, and other animals. The old patterns are reproduced at Tabriz and elsewhere, The carpets known as Turkey Kirmans are coarser, being fabrics of less merit. *See* Persian Carpet; Rug.

KIRSCH SAUCE. This is made by mixing

together and then boiling ½ pint of water and 2 teaspoonfuls of arrowroot. When they have boiled for two or three minutes, sweeten them to taste, and add about a gill of kirsch. If liked, cornflour may be substituted for the arrowroot.

KITCHENS AND THEIR ARRANGEMENT

Suggestions for Suitable Furniture, Fittings and Equipment

An article on the Kitchen, which is the domestic workshop, suggests reference to its fittings, e.g. Cooker; Cupboard; Dresser; Range; Refrigerator; Sink; to the practice of cooking, on which there are hundreds of articles in the work; and to the entries on Electricity; Gas. See also Chair; Cottage; Door; Flat; House; Labour Saving; Larder; Scullery; Tile.

Compactness is a great advantage in any kitchen and the disposition of cupboards, sink, range, electric or gas cooker should be thought out with a view to minimizing the number of steps taken in the various duties to be performed. A small kitchen saves much walking about, but it is more difficult to work in, as constant tidying up is necessary, if muddle is to be avoided. Even in the largest kitchen compactness can be achieved by careful consideration of the disposition of furniture and fittings, placing the working equipment close together and reserving extra space for comfortable chairs and a table for meals. Adequate ventilation is most necessary. A grating high in the wall or over the outer door is desirable, as this permits the escape of the hot, stale air that rises when cooking is in progress.

A north light is best, and the larder should be on the north side, so that this is the proper location for the kitchen. The relative positions of the sink, kitchen cabinet or dresser, and stove should be such as to minimize the number of journeys between them. The range or cooker should be well placed with, if possible, a cross light. A convenient cupboard may be on the left and a kitchen cabinet, or fitted dresser, on the right. The sink should be under a window, or at least well lighted, and easily accessible from the work table. If possible there should be an electric light or gas fitting above the sink. In a house where the kitchen adjoins the dining room a service hatch saves labour and a lift is a great convenience for service from a basement kitchen to a dining room on the floor above.

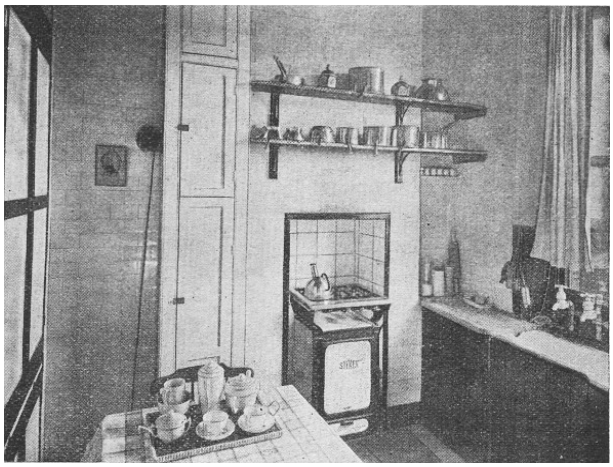
It is most important that a kitchen should be bright, light, and as airy as possible; that it should have as many simple labour saving devices as are compatible with its size and the required amount of cookery to be done; and that the home worker who spends a good deal of time in the kitchen should have a comfortable corner in it, if no other sitting room is available. An attractive kitchen is no more expensive to decorate at the outset than a drab one.

Where there is a scullery it is often better to concentrate all the rough work there and let everything that is to do with food and the preparation of food, except vegetables, be done in the kitchen. For this reason many people find it better to have a small white porcelain sink in the kitchen as well as the larger one in the scullery. If all cookery equipment is in the kitchen the labour and steps involved in going in and out of the scullery for water and also for many of the utensils required can be avoided. The perfect sink to wash up in is about a foot deep, fixed at a convenient height, which does not necessitate stooping, with draining boards on either side. Large sinks are sometimes divided for washing and rinsing with swivel taps or a double set of hot and cold. A plate rack over the draining board and, if possible, a tiled splash back to the sink are obvious advantages.

Where several servants are kept a pantry between kitchen and dining room containing glass and china cupboards, service hatch and a sink is a great convenience. A separate washhouse is a useful feature where much laundry is done at home. Kitchen quarters must be adequate for the size of the family to be cooked and catered for, also the number of servants kept must be a consideration. A scullery and pantry mean simply extra labour and cleaning for one maid, but it is almost impossible to do without them and be comfortable if both a kitchenmaid and scullery maid are kept, or if a large household has to be cooked for and the work entails a great deal of washing up and preparation of food. A good sized kitchen is often a practical necessity in the case of the housewife with young children. She wishes to have them under her eye, but not under her feet while she is working. Some of the newer houses are provided with an alcove for meals in the kitchen which is a great asset and can be utilized as a playroom for the children during the morning's work. Where a maid is kept such an alcove forms a pleasant sitting room recess.

Walls and Ceiling. The decoration of the kitchen has advanced of late years in practical and yet attractive fashion. Washable papers, good enamel paint, tiles and their substitutes are well employed in a room where hygienic cleanliness is the first consideration. There is no need for too much white in a kitchen. If on the northern or sunless side of house, or flat, in spite of the glow from cooker or range, an all white kitchen will look cheerless. On the other hand, there is something suitable about a cool scheme, such as blue or green with black and white. Glossy effects are excellent in a kitchen. A dado of white tiles with white enamelled walls and ceiling is refreshingly clean if the rest of the woodwork is painted blue, a black and white linoleum being chosen for the floor, and black and white check gingham curtains for the window. The paintwork can be picked out with black and the architrave of the door can also be black to give character to the room if a large one. The saucepan stand and various containers could be enamelled blue, a gaily coloured pattern chosen for the dinner service on the dresser, while rush mats would add further brightness to a cheerful scheme.

There is an excellent and inexpensive substitute for wall tiles. This is an enamelled zinc product of British manufacture and may be used for wall tiling or for lining a cooking recess and for a sink surround. These tilings need not be necessarily in white, but are obtainable in attractive tints. Another form of imitation tiling which enables the housewife to produce a charming effect at a small cost is obtainable in sheets which are applied to the walls in the same way as an ordinary paper. This tiling substitute can also be washed and wears excellently. It is infinitely more pleasing than the old-fashioned varnished papers which are still obtainable in tiled patterns.



Kitchen. Fig. 5. A well arranged small kitchen with tiled walls, recessed gas cooker, convenient shelves for saucepans above it, and ample cupboard accommodation. (Humphrey & Vera Joel)

Another suitable wall decoration is a washable paper which has a mat surface and is waterproof. Stains can be removed from such a paper by means of a damp cloth. It is made in a variety of colours and patterns. There is a preparation for rendering any wallpaper washable, which can be used by a decorator without affecting the appearance of the wall covering. Ceilings are best treated with enamel, but, failing this, one of the flat wall paints will be found more durable than ordinary whitewash.

Furnishing and Floorings. Where a kitchen is well lighted and also used for meals, built-in furniture should be painted to match walls. Windsor chairs and table can be of painted wood, but a porcelain enamelled top may be fitted to the table if it is to be used for culinary preparations. Such tops are obtainable in white or in colours, very practical kitchens are equipped with these tops, made to measure for the table surfaces of dressers, draining boards, shelves, window sills, wall slabs, cupboard tables and larder shelves. The surface is especially prepared to withstand hot plates, dishes or cookery utensils. No scrubbing is required for cleansing, but merely a rub with a damp cloth.

Where space saving is important a meat safe and table combined is a good idea. In some flats the larder is merely a shallow cupboard with shelves and not well ventilated. The provision of a meat safe table, with steel enamelled top and having a cupboard below which is zinc lined, with a ventilation regulator, is therefore an excellent solution for storage of hot food, which must never be put into a refrigerator. The latter piece of kitchen furniture has become more usual of late years. Models are obtainable which can be run by gas or electricity and some by paraffin oil, making it possible for people in the country to have refrigeration in their kitchens where neither gas nor electric power is available. The more costly pieces of kitchen furniture are obtainable by paying a small sum down and then by monthly instalments. The all-important matter of the range or cooking stove is discussed in detail under the various headings, Cooker, Range and Stove. The use of fuel or power is frequently dictated by local conditions and where electric power is cheap it has certain advantages on the score of cleanliness though in a large country kitchen the range provides a cosy centre to the home. Modern coal ranges are excellently equipped and there is also a cooking stove which burns small coke or anthracite. This is an efficient stove and needs only to be filled once and riddled twice in twenty-four hours. It also provides about ten gallons of hot water for washing up.



Kitchen. Fig. 6. Showing a kitchen cabinet in oak fitted with flour bin, extending porcelain table, cupboards and drawers, conveniently placed near the larder.

Kitchen Cabinets. Kitchen cabinets have increased in number and practical advantages. The one illustrated in Fig. 6 takes the place of a store cupboard and has an extending porcelain table, which is ideal for pastry making and requires no scrubbing. The position of the cabinet in this case has been determined by the larder, which is seen on the right, and within easy reach of culinary operations. Additional side units, as seen in Fig. 7, make a kitchen cabinet quite complete with ample accommodation for all cleaning requisites on one side and cookery utensils on the other. Cabinets may have vegetable racks, metal-lined bread drawers, egg racks, flour bins, and baize-lined cutlery containers. One model has an automatically sealing bread and cake bin and also a detached steel enamelled top table with extra chopping board. This table can be folded away inside the cupboard when not required. Such cabinets may be in oak or finished in enamel to match the woodwork of the kitchen. In any case, the inside is finished with glossy white enamel.

Where there is good cupboard and larder

accommodation the kitchen cabinet is often dispensed with. The dresser may be made more practical by having the upper shelves fitted with glass doors so that the dinner service need not be exposed to the dust of the kitchen. Cupboards underneath the dresser are also a space-saving idea and provide shelf room for kitchen crockery and tools. For storage purposes, if wall space permits, a long shallow cupboard is better than a narrow deep one. In the former it is possible to see at a glance what is on the shelves, whereas in the latter type of cupboard articles get pushed to the back out of sight. A washing up machine is very useful, but almost indispensable within reach of the sink is the plate rack, with compartments of various sizes, made to hold cups and saucers as well as plates and dishes. Another essential article is a clock. Washable porcelain kitchen scales are more hygienic than the old-fashioned type.



Kitchen. Fig. 7. Another type of cabinet in oak, with side units. The left-hand portion has shelves for cookery utensils, that on the right is made for vacuum cleaner, brooms and brushes. (Courtesy of Triumph Cabinet Works, Ltd.)

A good method of disposing of rubbish is a vital point of kitchen equipment especially in a flat. A sanitary receiver which is always covered is almost a necessity even where the private dustbin is located just outside, as constant going to this causes delay and is tiresome in bad weather. One with a detachable interior pail and an outer case of white enamel to which the lid is attached is a convenient refuse receiver. The lid opens by means of a foot pedal. A vegetable rack and a tripod saucepan rack are inexpensive items which should be provided. Pans should never be stored in a cupboard, but kept where a current of air reaches them.

In many modern houses jointless composition flooring is laid in a plastic state which has a surface that is easily cleaned. Tiled, brick or stone floors are all attractive and cleanly, but they are cold to the feet, and rush or other suitable mats should be provided. Rubber floorings and inlaid tiled linoleums of a good quality are suitable for boarded rooms. Plain dark colours are not a good choice for these last as they show marks and footsteps. Curtains can be of any washable material, but glazed chintz, gingham or coloured linen always look well. There is also a liking for rubberized material and for American cloth for casement curtains. Unless the kitchen is of the old-fashioned picturesque country type, or is used as part living-room, when the real domestic workshop is the scullery, a certain severity is best in furnishing accessories. Only practical curtains should hang at the windows unless the kitchen is overlooked when starched muslin glass curtains may be provided, preferably with rods top and bottom to keep them tautly in place. Checked American cloth is a good material for table covers and terry cloth for chair cushions.

Illustrated Suggestions. Our first photograph is of a kitchen in a small country house fitted with modern labour saving convenience and yet retaining a cosy look with its oak coloured woodwork, tiled flooring and chintz curtains. The porcelain sink possesses a double draining board. Electric power being available, there is an electric cooker and kettle. In the tiled recess beside the cooker is a boiler for the hot water services and small radiator system. A little sitting room for the maid opens out of the kitchen. The dresser is fitted with cupboards below, has sliding glazed doors above and a shelf specially fitted to take the row of gilded containers for dry ingredients. There is ample other cupboard accommodation on the wall not shown in the illustration.

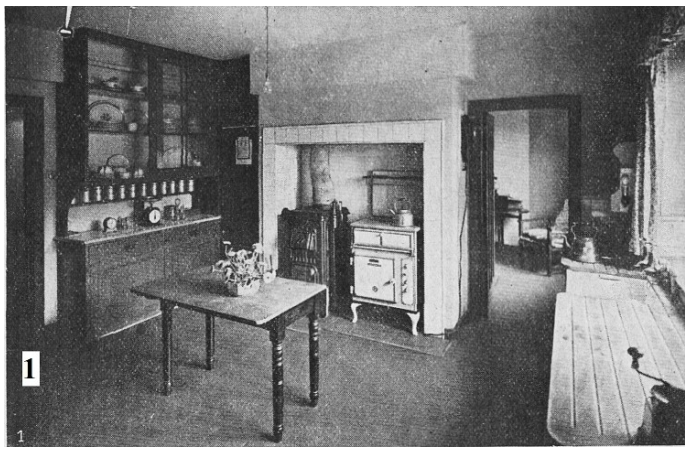
Completely equipped with electric labour-saving devices the kitchen depicted in Fig. 2 is admirably designed to make the most of a small space. It possesses a British made refrigerator, an electric cooker, boiling plate, water heater, washer and iron. The conveniently deep sink is well lighted; the plate rack is on the wall at right angles (not seen in the photograph), and the vitreous porcelain kitchen table is just discernible on the left. Green enamel surmounts the dado of glistening white tiles on the walls. A kitchen cabinet opposite the window with cupboards to contain china, glass, silver and drawers for cutlery and a fitted cupboard for brooms complete a compact and thoroughly efficient furnishing scheme.

An Efficient Town House Kitchen

A larger kitchen of a town house is shown in Fig. 3. The range has been removed to make room in the now tiled recess for two boilers. One of these is for the domestic supply of hot water and the other for central heating. The enamelled gas cooler is provided with a ventilating canopy. There is a seven-tiered saucepan stand and the porcelain sink is under the window. Beyond, not visible in the picture, is a teak-wood draining board and a plate rack. The kitchen table top is half of marble, which provides an ideal surface for pastry making. The enclosed dresser is opposite the window and there is a white enamelled clock and an enclosed electric light ceiling fitting.

A most efficient domestic workshop is shown in Fig. 4. With its spotless tiling, generously-proportioned

(Continued in page 1188)



Kitchen.
Fig. 1. Small country house kitchen with maid's sitting room adjoining. In the recess by the electric cooker is a boiler for hot water services.

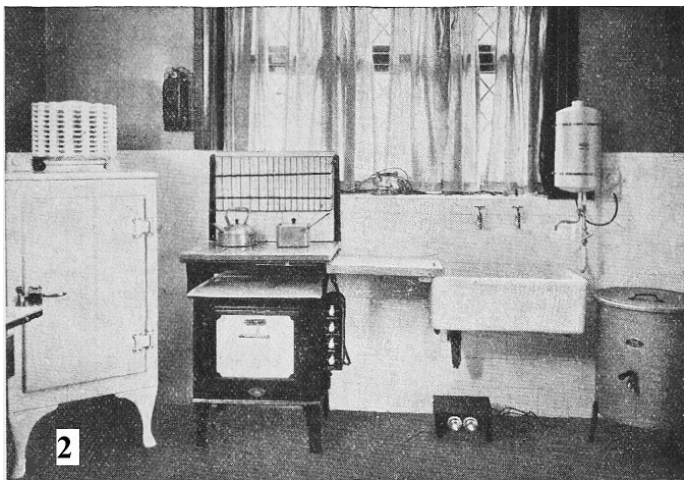


Fig. 2. The all-electric equipment in this kitchen includes a refrigerator, water heater, washer, iron and boiling plate.

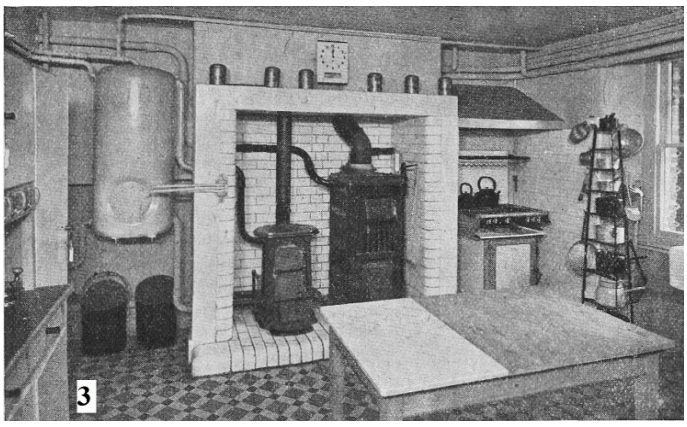


Fig. 3. A larger town house kitchen with two boilers installed respectively for domestic supply and central heating. The range has been removed and replaced by a gas cooker.

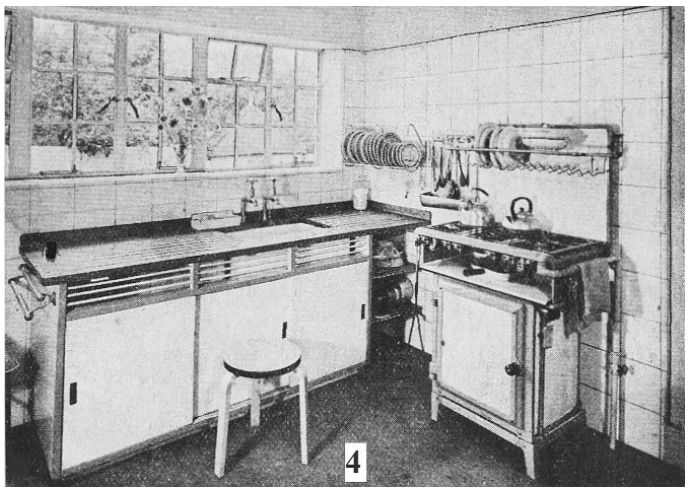


Fig. 4. An efficiently planned domestic workshop with ample cupboard space, long drainage boards which can be used for various purposes, modern gas cooker and attractive tiling.
(1. Humphrey & Vera Joel; 2. Veale & Co., Bristol; 4. Margaret Currant Studio)

drainage boards for the sink which lend themselves to every sort of kitchen use in addition to washing-up, this arrangement seems to radiate cleanliness and practical compactness. Comfort is provided for by a little stool which can be stowed away with other articles in the ample cupboard space beneath the sink. Other useful devices which can readily be incorporated into almost any kitchen plan include a meat-safe-table, which should be placed near a window; it is usually zinc lined with a vitreous porcelain top impervious to heat. Gas radiators also find a place in these quarters—to warm the kitchen when the cooker is not in use. A central kitchen table of the modern dual purpose type, with fitted drawers for cooking implements and cutlery, and an extra deal leaf which renders it suitable for pastry-making on the porcelain surface or for chopping on the wooden one is another idea.

An attractively designed small kitchen is shown in Fig. 5, which is suitably furnished for a flat. The cooker is recessed, the pot shelves are conveniently arranged, the taps are porcelain finished and there is excellent cupboard accommodation. The tiled walls could be less expensively treated by one of the imitation tilings mentioned earlier in this article. The flooring is a jaspé linoleum. In light grey this tones well with pale blue tiling, dark grey enamelled woodwork and aluminium saucepans.

Culinary Requisites. Besides decoration, and the more important furniture, there are a number of service aids and cooking utensils to be thought of when equipping even a small kitchen. Aluminium has taken the place of other metals to a great extent, but an iron frying pan is a convenience, as iron will stand a greater amount of heat than other metals, and boiling fat reaches a very high temperature. Fireproof china and glass are also used extensively in cooking, and these wares have the advantage that they can be brought to the table, thus obviating the necessity for extra dish washing.

The articles required for equipping the kitchen must vary with individual needs. It is a wise rule, however, to have a few things and renew these as occasion demands, and to have the simplest equipment possible.

For a small family the following equipment is suggested as a minimum: A set of pans, one of each size; a small and a large frying-pan; a preserving-pan, if preserves are to be made at home; a medium-sized fish-kettle, which can also be used for boiling hams and large puddings; a couple of kettles, an earthenware casserole, some oven glass ware and one or two small fireproof dishes. A set of basins and jugs for milk, two or three pudding dishes, a jelly mould, wooden spoons for mixing, a soup strainer, colander, mincing machine, grater, pastry board and rolling pin, with various-sized cake tins and a Yorkshire pudding tin.

Cutlery and Containers. Knives, spoons and forks for kitchen use and special culinary purposes should be included in the equipment. A stainless steel saw edged tomato slicing and lifting knife, a fruit and vegetable slicing knife, an apple parer, a meat chopper, tin opener, grape fruit cutter and corer, kitchen scissors, a juice extractor and a variety of pastry and vegetable cutters are a useful collection. There are many other devices which can be acquired as need and occasion arise, such as fruit slicing, bread cutting and potato mashing and peeling machines, but these are only essential in the larger household.

Glass containers for dry ingredients are excellent for use in a store cupboard, as their contents are quickly seen, though they should also be clearly labelled. Enamelled or gilded containers look well, when bought to match, in a row on a shelf or on the chimney piece. The newest and most attractive, however, for the small or less severe type of kitchen are the ones illustrated in Fig. 8. In creamy white highly glazed earthenware, decorated with quaint designs and delightfully shaped, these are obtainable for dry ingredients and for condiments.



Kitchen. Fig. 8. Kitchen containers in glazed earthenware obtainable for both dry and liquid ingredients and for condiments.

KITCHEN GARDENS AND ALLOTMENTS

Details and Plans of Two Serviceable Plots

Associated with this subject are the articles on the vegetables and fruits grown in a garden of this kind, e.g. Apple; Beans; Cabbage; Potato. See also Digging; Fruit; Insecticide; Manure.

The successful management of vegetables depends chiefly on thorough cultivation of the land, a correct rotation of crops, and the choice of kinds and varieties which will maintain an unbroken supply of produce. Those who cultivate vegetables to perfection for exhibition purposes trench the land from 2 to 3 ft deep, but that is costly and laborious work and unnecessary to ensure vegetables for an average household.

Cropping a vegetable garden is a most important operation. The principle of rotation is simplicity itself, being merely a system which prevents the growing of crops belonging to the same natural order repeatedly year after year in the same ground. The potato, however, is an exception to the rule, because good crops of potatoes may be raised from the same plot year in, year out, always provided there is a change of seed tubers every second season. An easy way to ensure proper rotation is to divide the ground into four portions. Planting will be as follows:

PLOT 1.

First year. —Peas, beans, celery, leeks.

Second year.—Carrot, parsnip, beetroot.
Third year.—Cabbage, cauliflower, kale, broccoli,Brussels sprouts, onion, lettuce, turnips.
Fourth year.—Potatoes

Plot 2.

First year.—Parsnip, carrot, beetroot.
Second year.—Cabbage, cauliflower, kale, Brussels sprouts.
Third year.—Potatoes.
Fourth year.—Beans, peas, celery, leeks.

Plot 3

First year.—Cabbage, cauliflower, kale, Brussels sprouts.
Second year.—Potatoes.
Third year.—Peas, beans, celery, leeks.
Fourth year.—Carrot, beetroot, parsnip.

Plot 4

First year.—Potatoes.
Second year.—Peas, beans, celery, leeks.
Third year.—Carrot, beetroot, parsnip.
Fourth year.—Cabbage, cauliflower, Brussels sprouts, kale, turnip, onions, lettuce.

It will be noticed that in the diagrams accompanying this article departure has been made from the above by suggesting a three-course cropping system. This scheme will be found equally satisfactory, and gives opportunity for devoting one of the four centre beds to the cultivation of small fruits. If the four-course system is preferred, however, ample space will be found in the marginal or outside borders for growing the small fruits shown in the plan.

Planting of vegetables is another matter which should receive much care. Endeavour to plant in showery weather, always use the garden line to guide sowing or planting in straight lines, and do not cramp distances between rows or plants. Much good seed is wasted by thick sowing, and it is far better to sow thinly and save unnecessary thinning out. Seedlings, whether sown in drills or seed-beds, should have a first thinning when they have formed their third leaf, thus giving up their room to allow greater development of the remaining plants. Never leave seedlings in a bed to mass together, but transplant early and secure better crops.

It is not possible in this article to include sowing quantities and planting distances for all vegetables, but the following instructions for popular kinds will be found useful. In all cases the estimate is given for a 25 ft. row.

Artichoke (Jerusalem), 3½ lb.— Plant spring or autumn, in drills 5 in. deep and 1½ ft. apart, with 8 ft. between rows.

Beet, ½ oz.—Sow 1 in. deep in early May, 1 ft. between rows.

Broad Bean, ½ pt.—Sow during Feb., 3 in. deep and 2 ft. apart in rows.

Broccoli, cabbage, Brussels sprouts, kale, and all winter greens, ¼ oz. sown during spring will produce hundreds of plants. Plant not less than 2 ft. apart all round. Four crops of cabbage may be produced, sowing times being August, March, April, and May. When transplanting green crops always nip off the end of the tap root of seedlings, as this will often prevent bolting.

Carrot, ¼ oz.—Sow in Feb. to April 1 in. deep in drills 1 ft. apart.

Cauliflower, ¼ oz.—Sow April, 1 in. deep in drills, and transplant carefully to rows 2 ft. apart.

Lettuce, ½ oz.—Sow at intervals of 3 weeks to maintain succession.

Onion, ½ oz.—Sow thinly in fine shallow soil during March, and roll firm. Use thinnings for salads.

Parsnip, ¼ oz.—Sow seeds in threes at intervals of 9 in. during March, thinning out to strongest plant.

Peas, ½ pt.—Sow varieties for succession from Jan. to July, 2 in. deep in rows of 1½ ft. more between the rows than the height of the variety.

Radish, ¼ oz.—Sow broadcast, or in drills, from Feb. to Oct. Sow sufficient only at one time for small gathering, and rely upon frequent sowings, otherwise they get woody and run to waste.

Shallots, 1 lb.—Plant in fine and firm soil in early March, 8 in. apart, in rows 12 in. apart.

Spinach, ½ oz.—Sow from March onwards, in drills 1 in. deep and 15 in. apart, at intervals of a fortnight to maintain supply.

Turnip, ¼ oz.—Sow monthly from Feb. to July, ½ in. deep, in drills 15 in. apart.

The two diagrams at page 1111A and B define the possibilities of kitchen gardens measuring respectively 148 x 96 ft., and 132x83 ft., either of which may be modified as re-quired. The root principle of each is the four central divisions to accommodate the rotative system of cropping. The encircling borders shown can be devoted to the crops, frames, and fruit trees, suggested in the diagrams; but it is unwise to depart from the plan given for the four central beds.

Allotments. The allotment may be regarded as a kind of kitchen garden. An allotment 10 rods in extent will supply a small family with vegetables all the year round, while a 20-rod plot will provide sufficient vegetables for a large family.

The following information is in Bulletin 90 issued by the Ministry of Agriculture. For an allotment a width of two rods (11 yards) is generally adopted. The length of a 20-rod allotment of this width is 55 yd. and of a 10-rod plot 27½ yd. The areas are respectively ⅛ and 1/16 acre. The ends of the plots should point east and west, and the end of the rows north and south.

Here is an estimate of what a first-class allotment of 10 rods may be expected to accommodate at mid-June. It is assumed that the plot is 27½ yd. (82½ ft.) long and 11 yd. wide.

Greens can be put out in June, during showery weather. Beetroot and French beans need not be sown

before mid-May, and it is possible to get a crop of radishes and even turnips off the ground before then. Spinach can be sown early in March, on a site near that which is to accommodate the scarlet runners, because the runners need not be sown before mid-May.

A reserve piece of ground for a seed bed is exceedingly useful. A strip 3 ft. wide with a length of 33 ft. is a great convenience, because, apart from accommodating such permanent crops as rhubarb and herbs, it affords plenty of room for seedlings of various kinds.

By the middle of August the following crops have probably been cleared off the ground: early potatoes, peas, broad beans, spring cabbages, early turnips, early salads, spinach (not spinach beet), and shallots. Early varieties of pea are best for small plots. The places of the early crops have been taken by winter greens, autumn cauliflowers, leeks, late turnips and vegetable marrows. There may be a piece of neatly raked ground sown with spring cabbages, autumn onions, and lettuces.

Now let us look at our table for the second half of the season.

On a 20-rod plot everything is easy as far as allotting space is concerned. There can be 10 rods of potatoes, with a change of ground every year. Practically everything suggested for the 10-rod plot can be carried out, but on a larger scale.

(See also page 1191)

KITCHENMAID: Her Duties. A kitchenmaid is, for all practical purposes, an assistant to the cook, and her duties are mainly confined to the kitchen and the preparation of meals. In large establishments two or more kitchenmaids are kept.

Her duties vary with the size of the household, but she is generally expected to cook the vegetables and such foods as do not need a high degree of skill, and to prepare the materials which the cook needs. Much of the washing-up usually falls to the lot of the kitchen-maid. In some establishments the cooking for the other servants is done by her. Many girls who aspire to become cooks gain their early experience in this way, and a kitchen-maid who has served under the cook of a famous establishment will find the training there valuable if she seeks a post of that kind for herself.

Kitchenmaids can be obtained, like other servants, by advertising in the newspapers, or by visiting a registry office. They should be insured against accidents that may happen to them in the course of their work, and also under the National Health Insurance scheme. *See* Cook; Insurance; Servant.

KITCHEN RANGE. This contains an enclosed fireplace, with one or more ovens at the side, and a flat top, wherein are a number of holes, with removable covers; this structure enables the fire to be fed and cooking utensils to be placed thereon. There is a great variety of ranges, and they are made to suit all types of houses, from the largest to the smallest. Some firms make a speciality of ranges suited for the tiny kitchens found in flats and small dwellings generally. *See* Cooker; Range; Stove.

KITCHEN TABLE. Fig. 1 is probably the simplest method of construction for a kitchen table, since it involves no mortise and tenon joints. Dimensions are given in Figs. 2 and 3. The legs are cut from 2 in. deal squares to the height of the table, less the thickness of the top. At the top end of each leg on two adjacent sides mark with a square the width of the rails, and with a gauge set to half the thickness of the rails, i.e. ½ in., mark the ends of the legs, thus indicating the width and depth of the shoulders to be cut to take the rails.

The two surplus portions of the legs may be cut away with a tenon saw, as is shown in Fig. 4, and the legs then tapered from below the shoulder ¼ in. on each side. The rails should then be prepared from 1 in. stuff, cutting them off square at each end. Note that the side rails reach only as far as the recessed portion of the leg (Fig. 4), while the end rails are sufficiently long to line up and cover the end grain of the side rails. The undersides of all rails are bevelled off as shown, and holes to take the screws bored, those in the end rails being farther away from the end so that all the screws will go into the leg. The whole is screwed together, fixing the side rails on first (Fig. 4), and corner blocks glued in for additional strength. The top, of course, will have to be jointed up to obtain the width. One-inch stuff should be used, and this should be fastened down to the framework by pocket screwing, as shown in Fig. 5.

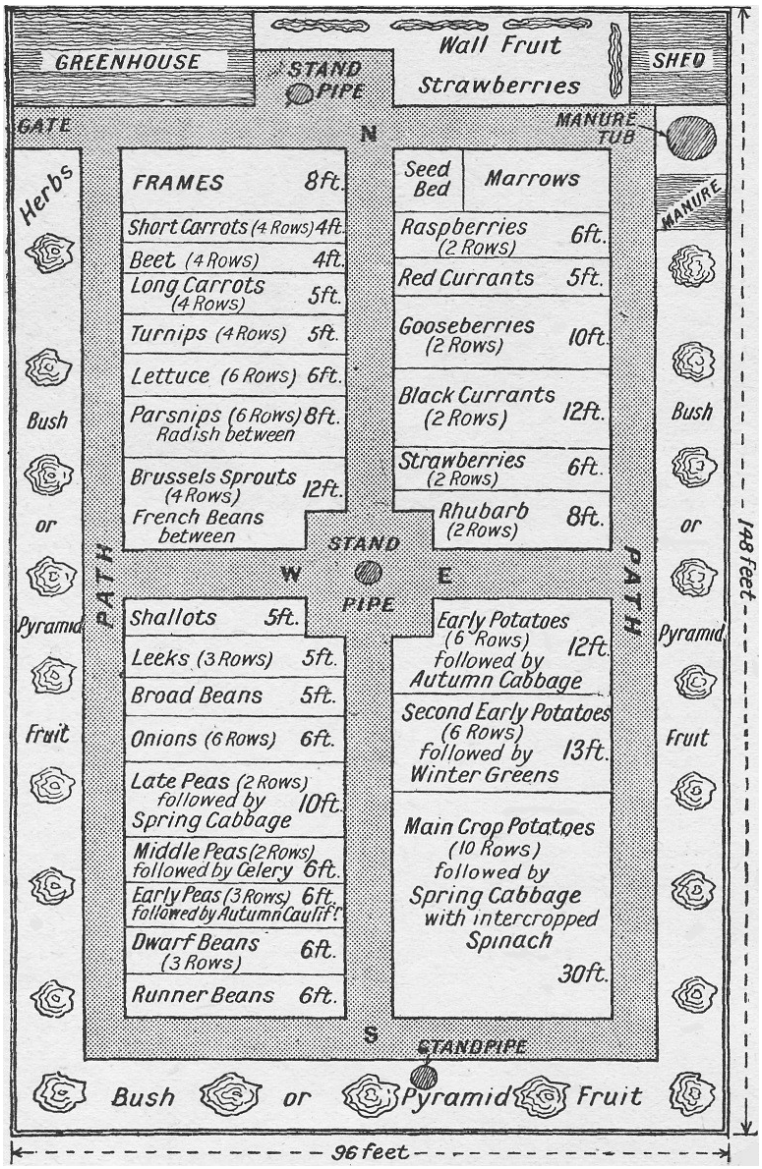
Another Type of Table. The table in Fig. 6 has a better appearance and is fitted with a drawer, though this may be omitted. The necessary dimensions are indicated in Figs. 7 and 8. The legs are cut off, and the top ends marked out for the mortises. If a drawer is not required, all four legs will be marked alike, otherwise the drawer end will be fitted with two rails, as in Fig. 9, the lower one being tenoned in and the top dovetailed. These two rails should be about ½ in. wider than the legs, and are cut round the latter as shown.

When all the joints have been carefully cut, the whole is glued together, taking the two sides first, and allowing them to set before glueing the remainder. When dry, runners are fixed, Fig. 10, being nailed, glued, and further strengthened with corner blocks rubbed in at the top. These blocks should be planed to width so as to line up with the inner surface of the leg and act as guides. The drawer may be dovetailed or rebated. The top is fixed as before with screws fastened from underneath. *See* Drawer; Table.

(For kitchen table diagram see page 1192)

KITE: How to Make. The best-known simple kite is the pegtop pattern, shown in Fig. 1. It is of fairly small size and covered with tissue paper gummed to the frame; such a kite, a foot long, can be flown on

(*Continued in page 1193)*

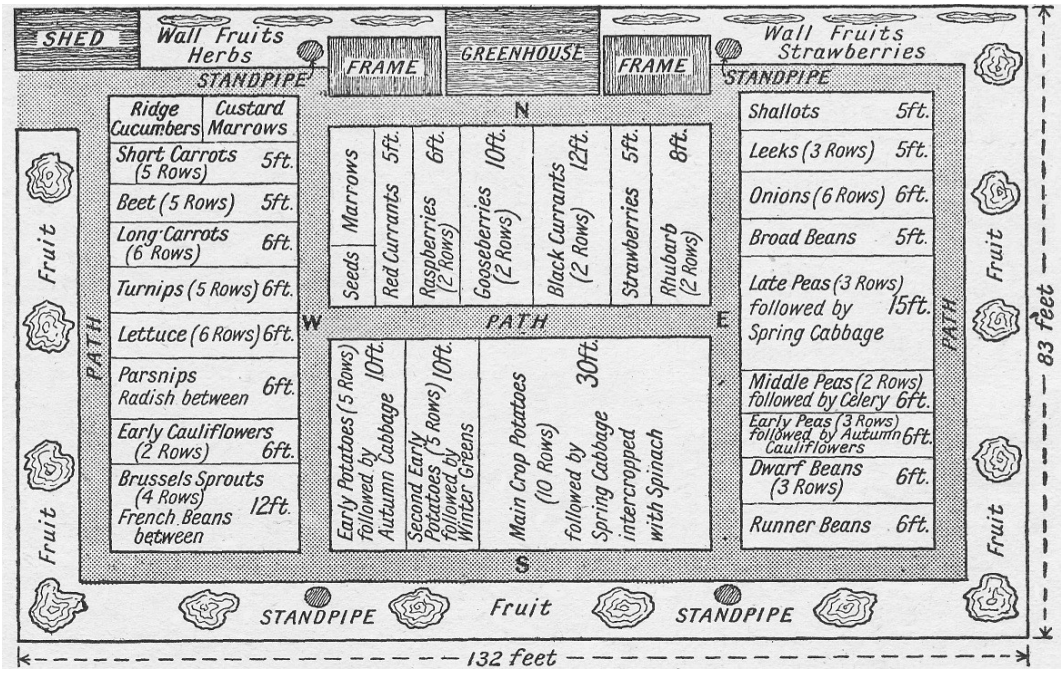


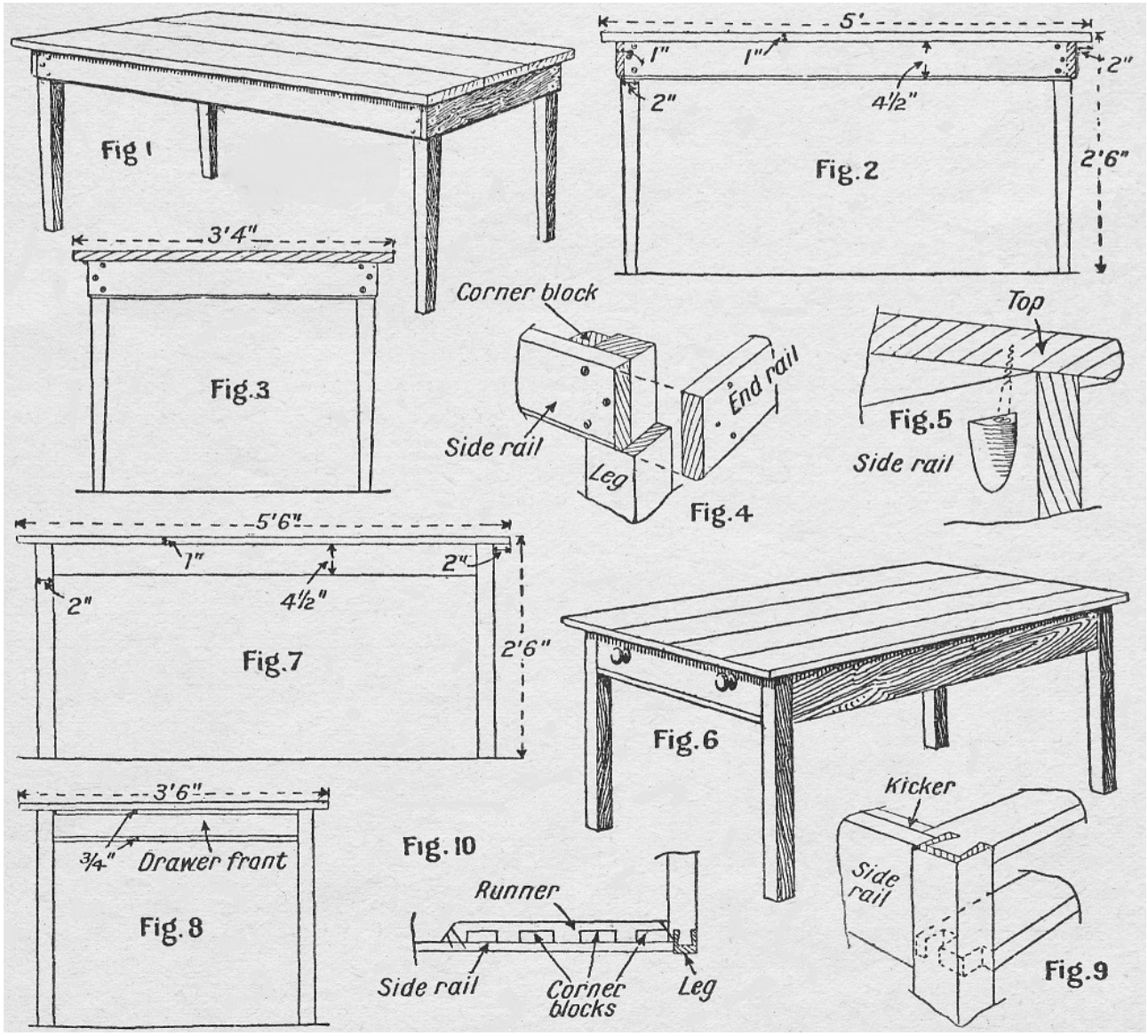
Kitchen Garden. How to lay out a garden which measures 132 by 83 ft. Three plots are devoted to vegetables, while in the fourth are grown small fruits, such as currants and gooseberries.

Left, suggestions for planting a kitchen garden measuring 148 by 96 ft., showing a similar rotation of crops and fruit.

Crops at mid-June		Feet run
Potatoes, 8 rows, mid-early,	2½ ft. apart	20
Potatoes, 8 rows, late,	3 ft. „	24
Onions, 4 rows,	1 ft. „	4
Beetroot, 3 rows,	1 ft. „	3
Carrots, 3 rows,	1¼ ft. „	3¾
Parsnips, 3 rows,	1¼ ft. „	3¾
Peas, 1 row,	2 ft. „	2
Beans, broad, 1 double row,	3 ft. „	3
Beans, French, 1 row,	2 ft. „	2
Beans, runner, 1 row,	6 ft. „	6
Cabbage, 3 rows,	2 ft. „	6
Shallots, 2 rows,	1 ft. „	2
Bed with seedling cauliflowers, winter greens, leeks, salads, rhubarb, herbs, etc.		3
		82½

Crops at mid-August		Feet run
Winter greens and autumn cauliflowers, 8 rows,	2½ ft. apart	20
Potatoes, late, 8 rows,	3 ft. „	24
Onions, 4 rows,	1 ft. „	4
Parsnips, 3 rows,	1¼ ft. „	3¾
Beetroot, 3 rows,	1 ft. „	3
Carrots, 3 rows,	1¼ ft. „	3¾
Beans, French, 1 row,	2 ft. „	2
Leeks, 1 row,	2 ft. „	2
Celery, 1 row,	3 ft. „	3
Beans, Runner, 1 row	3 ft. „	3
Spinach Beet, 2 rows,	1½ ft. „	3
Vegetable marrows and cucumbers, bed 5 ft. wide		4
Seed bed of late turnips, autumn onions, spring cabbages and lettuces		4
Original reserve bed with rhubarb, herbs, late turnips and late salads		3
		82½





Kitchen Table.

Fig. 1. Simplest form of kitchen table.
Figs. *2* and 3. Side and end elevations, giving measurements.
Fig. 4. Detail of joints.
Fig. 5. Method of fastening table top to framework.
Fig. 6. Another type of table, fitted with a drawer.
Figs. 7 and 8. Side and end elevations.
Fig. 9. Detail of drawer fitting.
Fig. 10. Banners and corner blocks in drawer aperture.

stout thread as a line. The frame consists of a relatively stiff wooden backbone, and a thin, flexible piece of split cane bent to a semicircle by a string arranged like a bowstring. The centre of the bow is lashed to the top of the backbone, and strings are run from the horns of the bow to the bottom of the backbone; these strings, however, are not too tight, as the strain is to be taken on the bowstring.

After the frame is covered, a piece of string double the length of the kite has its two ends tied to the backbone, one near each end. This is the bridle, and the kite line is tied to it so that the upper arm of the bridle is shorter than the lower. The rig of the kite is completed by a tail, to which convention consigns the form of a string two or three times the length of the kite, tied to the bottom of the backbone and having screws of paper tied to it at intervals; a strip of fabric, however, answers the purpose equally well, being more durable and less trouble to fix.

Home-made pegtop kites sometimes have a rigid wooden member instead of the bowstring. This is a mistake, as it tends to prevent the horns of the bow from bending backwards under the air pressure, as they must do to give the dihedral angle effect needful for stability.

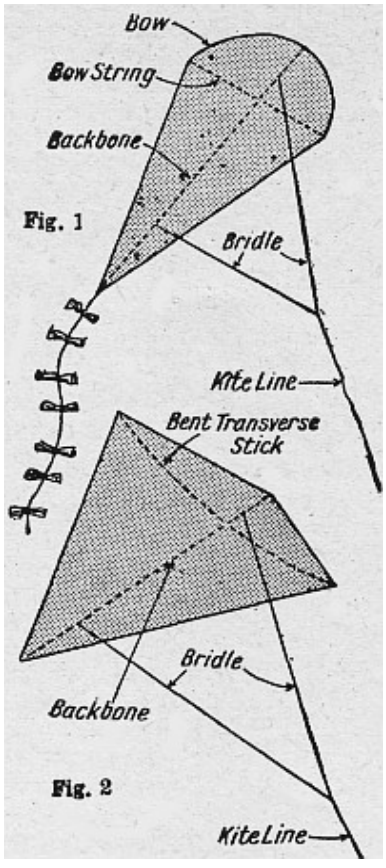


Fig. 1

Fig. 2

The adjustments that have to be made consist in varying the amount of tail carried and the point of the bridle at which the line is tied on; the kite will not fly unless these adjustments are made suitable to the speed at which the wind is travelling.

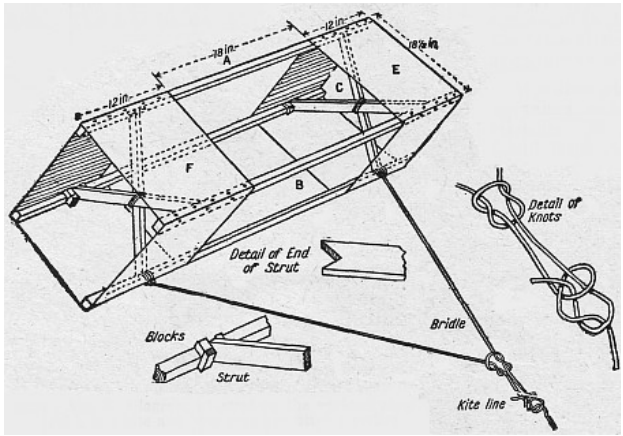
Kite. Fig. 1, Pegtop pattern.

Fig. 2. The Eddy Kite. Directions for making both are here given.

The pegtop pattern is inconvenient in large sizes, as it cannot well be taken to pieces for travelling. A modified form of it is therefore used in which the bow-string is replaced by a straight and particularly flexible stick and the bow omitted, the frame thus consisting of two wooden members arranged in the form of a cross, with a surrounding edge of string tied in succession to the four ends of the sticks. If this frame is covered with a light cotton fabric it can easily be arranged so that the sticks may be removed and the whole rolled up for transport. The same adjustments as in the case of the pegtop kite are needed in order to secure for it a satisfactory stability.

An Eddy Kite. A more ambitious form of portable kite is the Eddy type. In this the frame consists of two sticks of equal length arranged in the form of a cross, the two being lashed together at their meeting point, which is one-fifth of the length of the backbone from the top end; a surround string is fitted as usual. The dihedral angle effect in the Eddy kite is obtained by bending the ends of the transverse stick backwards and holding them in this position by a bowstring, which, of course, lies clear at the back of the kite. The cotton covering is made rather wider than the frame, so that it is rather baggy, and bellies out like a sail when the kite is flying. When properly adjusted these kites do not require a tail at all; the adjustments consist in varying the point of attachment of line to bridle, and in regulating the tension in the bowstring at the back of the kite.

Box Kite. Named from its rectangular form, the box kite is an excellent flyer, and can easily be made. The sizes given have proved successful, but can be modified to suit individual requirements. Constructional and other details are made clear from Fig. 3.



Kite. Fig. 3. Diagram illustrating the various parts of a box kite and how they are fitted together.

The longerons or corner pieces, A B, are made from ⅜ in. square stripwood, obtainable at most model shops, or may be cut from a piece of pine ⅜ in. thick, and planed up true. These pieces should measure 42 in. long. The diagonal struts, C, are approximately 26 in. long and made from similar material, but these ½ in. wide and ¼ in. thick. The two bands, E F, can be made from any very light material such as cambric or madapolam. Cut two pieces each 6 ft. 3 in. long and 13 in. wide. Turn a hem on each side, and sew it twice to give the greatest strength. Take care not to cockle the material; the flatter the bands the better they will be. When hemmed, the bands should measure exactly 12 in. in width. Now overlap the ends and sew them together very strongly, thus making two endless bands.

Lay them flat on the table and then flatten them out, creasing the folds. Have one fold at the joint of the ends. Next fold over again, thus dividing the piece into four and again press at the folds. These 4 creases will show just where to fix the 4 longerons, one being tacked on with 5 brass tacks to each corner or crease, and on the inside of the band.

Notch the ends of the diagonal struts, and glue a bit of tape around them near the ends, to prevent splitting. The length of these struts should be such that when they are in place they will be slightly bowed, and thus keep the bands taut. Tie the struts together at the centre with thin string, and to prevent them slipping from their position glue or nail some little blocks of wood to the longerons. By leaving the struts loose the kite is easily dismantled for transport purposes.

A bridle of stout string is securely tied to one of the longerons, 6 in. from either end. The kite line is attached to the bridle with a reef knot and bowline knot to permit of its being adjusted on the bridle, the best positions being found by experiment. In general, the lighter the wind the shorter the front line of the bridle. In a very strong wind it might be advisable to attach the kite line directly to the longeron, just behind the front band.

KLONDIKE. This is a card game for one or more persons. It is played with the ordinary full pack of 52 cards. The cards are shuffled and cut in the ordinary way, and the first card is turned face upwards on the table. To the right of this card, but face downward, are placed in a row six cards. Immediately below the left-hand card of this row of unexposed cards is placed another card, face upward, and five more cards to the right of it, below the top row and face downward. So the next row has one faced card and four face downward, and so on until there are seven faced cards and twenty-eight cards in all on the table in the form of a right-angle, apex downward.

Any aces which have been exposed are taken from the lay-out and placed elsewhere on the table to form the foundations on which to build. Upon them are placed cards in sequence, two, three, four — king. When any card of the lay-out is uncovered by playing away the bottom of the row, the next card in that vertical row is turned face upward. Cards in the lay-out are built in descending sequence, king, queen, jack, etc., to the two, and alternate red and black suits. The remainder of the pack not put down in the layout is dealt out one at a time, and any card exposed may be used either on the lay-out or on one of the foundations. Spaces in the layout can only be filled with kings. If there be more than one card at the bottom of a row showing, all must be moved together or none.

A player pays fifty-two counters for his pack and receives five counters for every card he succeeds in getting on the foundations, running through the pack once only.

KNAPSACK. This is a form of bag used by soldiers, scouts, and travellers on a walking tour, to hold the necessary articles of food and clothing. It is carried on the back, supported by shoulder straps, the usual type being equipped with a long, loop-like strap, attached to the top of sides, to pass under the armpits and over the shoulders round the back of the neck.

Knapweed. The common name of the perennial Centaurea. *See* Cornflower; Sweet Sultan.

KNEE. This joint is formed by the junction of the lower end of the thigh-bone, the femur, with the upper end of the large legbone, the tibia. The patella, or kneecap, glides over the front of the joint. The bones are held together by a number of ligaments.

The knee is much exposed to injury, and this may be followed by synovitis with an accumulation of fluid in the joint, on which the kneecap is felt to ride or float. This requires rest and perhaps painting with iodine to promote absorption. The knee should also be firmly bandaged with a flannel or a woven elastic bandage. Very often it happens that when one gets up and about the swelling recurs, but with the daily application of the bandage this gradually diminishes and disappears.

Not uncommonly one of the cartilages is displaced, in football or similar accidents. The knee is locked in a bent position and is very painful. When put right it may easily recur, and a protective cap should be worn. *See* Dislocation; Housemaid's Knee; Knock Knee.

KNEELING PAD. Pads or mats used to kneel upon while floors are being scrubbed serve to protect the knees from cold, damp, and soreness. They are especially necessary on tiled floors, and should be thick enough to prevent the cold from penetrating through. Several thicknesses of felt or some similar material make a good pad, but the rubber kneeling mats obtainable in kitchen equipment departments of stores are the best for indoor and outdoor use, being dampproof.

KNIFE: For the Table. It is claimed for some of the newer types of stainless steel table knives that they never require re-sharpening. These have serrated edges and include dessert and bread knives.

Stainless steel knives which are not thus guaranteed need a special form of sharpener. The best is one which has two grooved revolving rollers. The edge of the knife is placed between these two rollers and drawn backward sharply. Stainless steel will become scratched somewhat easily. To clean blades of the stain-less variety they should only be dipped in water and wiped. The placing of handles of knives in hot or cold water should be avoided, as this usually causes early discoloration.

Hardened steel knives which are not stainless are to be had in various qualities. The cheap varieties are fitted with what is known as single-shear steel blades, but the higher priced and more durable qualities are fitted with double-shear steel blades, which are cross-rolled.

Handles for Knives. The best handles for knives in everyday use are those which very closely imitate ivory. There are many materials which give quite an excellent reproduction of ivory, but as long as cutlery is purchased from some well-known firm that specializes in Sheffield-made cutlery there need be very little fear regarding the discoloration of handles, as all the best firms use a reproduction of ivory which will neither discolour nor split, whereas with real ivory handles, unless of the finest grain and quality, there is always a risk that the ivory will crack owing to the expansion or contraction which is caused by varying temperatures.

A simple test can be applied to assure oneself of the quality of a metal-handled knife. The end of the handle of the knife should be held lightly between the finger and the thumb, and the point of the knife should be sharply tapped on some hard surface, such as china or glass. If the blade is hard soldered to the handle the metal will ring almost like a silver or gold coin when it is tested. If a knife is fitted with an inferior tang, and the metal blade is filled with a composition, there is a dull sound when the above test is applied.

Metal handles for knives are made in Georgian styles; also many continental styles of knives have come into vogue. The difference between these and the usual English patterns is that the continental styles of knives are usually fitted with shaped blades.

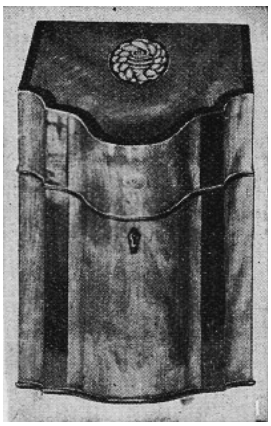
Cleaning the Knives. Knives which are not of stainless steel can be cleaned with a damp rag dipped in powdered bathbrick or by means of a knife board or cleaner.

The latter is preferable; but a specially prepared powder should be used with the board. It is well not to wash knives in hot water, as if the blades are heated the metal tangs expand and the handles may split. Many persons try to avoid this by immersing the blades only.

Ivory and bone handles should never be washed with soap or in lukewarm water, as this causes discoloration. It is better to wipe them with a soft cloth that has been moistened with peroxide of hydrogen, and afterwards place them in the sun, which will whiten the ivory or bone.

Repairs to Knives. The handle of a carving or table knife may possibly become slack, and when it does it should be immediately seen to. If the blade can be removed from the handle, it will be evidence either that the tang is broken, which can be seen by inspection, or that the holding pins have sheared or broken. If the latter is the case, carefully punch out from the handle the remaining portions of the pins, and do likewise from the tang, and test to see that it is straight and true. Next prepare some cement composed of melted resin, pour this into the hole in the handle, and having previously warmed the tang, insert it in place and hold it in position until the resin has set. Then drill out the resin from the pin holes and make them all secure with new pins of brass or German-silver wire. They only need very slight riveting in order to make them secure.

Xylonite-handled carving knives and forks frequently have serrated tangs, which are difficult, if not impossible, to remove. Other types have through tangs, which are often riveted on to a washer or cap at the end of the handle. This has to be removed before the knife can be repaired. A slight slackness can be taken up by further riveting the end cap. If the knife or fork is of rustless steel it will need especially careful handling, as this material is much harder and more prone to break while being repaired. Drilling is more laborious, and requires plenty of lubricant on the drill to keep it cool and cutting freely. Otherwise similar methods can be applied. This second style of case is illustrated in Fig. 2. It is constructed of satinwood and beautifully painted.





Knife Box. Fig. 1. Example with marquetry of satinwood, maho-gany and sycamore. Fig. 2. Urn-shaped box in painted satin-wood. Both of 18th cent. English workmanship. (Victoria & Albert Museum)

KNIFE BOX. In the 18th century knife cases were made in two distinct styles. Fig. 1 shows the type with a sloping hinged lid and a moulded front; the interior being divided into compartments raised one above the other for the knives, etc. Many of these are made of satinwood and some of mahogany, the wood being often veneered on oak; others were inlaid or edged with sycamore and boxwood. During the classical period Adam, Hepplewhite and Sheraton also designed many of the rarer and more elaborate knife urns.

Knife boxes were frequently seen on the sideboards in the 18th century. They stood on the pedestals that flanked many of these pieces designed by Sheraton and other makers. *See* Carving; Cutlery; Draw Knife; Ivory; Paper Knife; Pocket Knife; Pruning Knife; Sideboard; Steel; Table Laying.

KNIFE REST. Rests for supporting the carving knife and fork on the table are made in pairs in silver and electro plate, and also in glass. Each consists of a bar raised above the table by two supports. The supports take various forms, some being plain and others ornamental. They may represent an animal or some other kind of figure. *See* Carvers; Silver; Table Laying.

KNIGHT'S TOUR. This is a useful pastime for an invalid or a child. All that is needed is a chessboard and 64 counters. The object of the game is to place all the counters on the board, the positions being those that a knight would take up at chess. The player can begin on any square, and his aim is to place the counters on the board so that the whole of the 64 squares are filled up. *See* Chess.

Kniphotia. This is a hardy perennial, known also as red hot poker, torch lily, and flame flower. *See* Red Hot Poker.

KNITTED AND STUFFED TOYS
Instructions for Making Nursery Favourites

Other articles in our work which deal with the construction of playthings for small children are Dolls and their Homes; Noah's Ark; Toys. For related information consult also Crochet and the subsequent entry under the heading Knitting.

To knit delightful, inexpensive and cuddlesome toys which really appeal to babies and very young children and are also most saleable articles on the nursery stall at a bazaar requires no special skill in arts and crafts and only a simple knowledge of knitting, which can be quickly acquired by studying the article on that subject which follows this one. The success of a stuffed toy depends largely on the way it is stuffed. Kapok is used for these, and 1 Ib. bags cost from 1s. 6d. to 2s. It is astonishing how much stuffing is required in order to make a toy really hard wearing and nicely shaped.

The five toys illustrated and described can be made up in other colours and the sizes varied. We have to thank the Best Way Series for kind permission to reprint some of their excellent ideas here. The abbreviations used are K., knit; tog., together; st., stitches , inc., increase; p., purl; Ips., loops; rpt., repeat.

Wilfrid the Rabbit. The first toy is that well established favourite Wilfrid. He costs about 3s. 6d. to make and requires 2½ oz. of pale blue and 1 oz. of white teazle wool; one pair of knitting needles (steel) size 11, 2 black shoe buttons. Kapok for stuffing.

The work begins at the base of the body. *1st row:* With the blue wool cast on 14 st.. k. 30 rows. *31st row:* Inc. in first st. (15). *32nd row:* Inc. in last st. (16). Rpt. these 2 rows 6 times (28). *45th row:* K. 30 rows. *75th row:* K. 10 st., place these on a safety-pin. Cast off 6 st. for armhole, k. remaining 12 st. *76th row:* K. 13 rows on these 12 st. *89th row:* Inc. in first st. (13). *90th row:* K. Rpt. these 2 rows once (14) and put these on a pin. *93rd row:* Pick up the 10 st. from the safety-pin, join wool to where the 6 st. were cast off and k. 13 rows. *106th row:* K. Inc. in last st. (11). *107th row:* K. Rpt. these 2 rows once (12). *110th row:* K. Pick up the 14 st. from the pin and k. them (26). *111th row: K. 112th row: K. 2* tog., k. 8 st., k. 2 tog., k. to end of row (24). *113th row:* K. Rpt. these 2 rows 3 times (18). *120th row:* K. 2 rows. *122nd row:* Inc. at beginning, middle, and end of needle (21). Rpt. this row once (24). *124th row:* Inc. in first st. (25). *125th row: K.* Rpt. these 2 rows 3 times (28). *132nd row:* K. 12 rows. *144th row:* K. 2 tog. at each end of needle (26). *145th row:* K. Rpt. these 2 rows 3 times (20). *152nd row:* K. 2 tog. at beginning, middle, and end of needle (17). *153rd row:* K. Rpt. these 2 rows 3 times (8). Cast off. K. another in the same manner.



Knitted Toys. Fig. 1. Wilfrid the Rabbit, in teazle wool.

Front of Body.—1st row: With white wool cast on 18 st., k. 26 rows. *27th row:* Inc. in first and last st. (20). *28th row:* K. Rpt. these 2 rows twice (24). *33rd row:* K. 2 tog. at each end of needle (22). *34th row:* K. 5 rows. Rpt. these 6 rows 3 times (16). *57th row:* K. 12 rows. *68th row: K.* 2 tog. at each end of needle (14). *69th row:* K. 3 rows. Rpt. these 4 rows 4 times (6). *88th row:* K. 2 tog., k. 2 st., k. 2 tog. (4). *89th row:* K. 2 tog. twice (2). Cast off.

Leg.—1st row: With blue wool cast on 8 st., k. 6 rows. *7th row:* Inc. in first and last st. (10). *8th row:* K. 23 rows. *31st row:* Inc. in first st. (11). *32nd row*: K. Rpt. these 2 rows 9 times (20). *5lst row:* K. 12 rows. *63rd row:* K. 2 tog. at each end of needle (18). *64th row:* K. Rpt. these 2 rows 5 times (8). Cast off. K. another in the same manner.

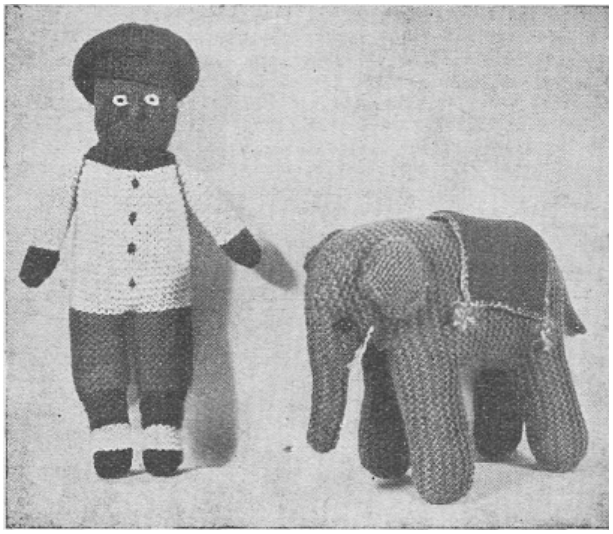
Inside of Leg.—1st row: With white wool cast on 8 st., k. 6 rows. *7th row:* Inc. at each end of needle (10). *8th row: K.* 23 rows. *31st row:* Inc. in first st. (11). *32nd row*: Rpt. these 2 rows 6 times (17). *45th row:* Inc. in first st. (18). *46th row:* Cast off 5 st., k. to end of row (13). Rpt. these 2 rows 3 times. Fasten off wool. K. another in the same manner.

Ears.—1st row: With blue wool cast on 7 st. K. 4 rows. *5th row:* Inc. in first and last st. (9). *6th row:* K. Rpt. these 2 rows twice (13). *11th row:* K. 44 rows. *55th row:* K. 2 tog. in middle of row (12). *56th row: K.* Rpt. these 2 rows once (11). Cast off. K. another ear in blue wool and 2 in white wool.

Arms.—1st row: With blue wool cast on 12 st., k. 10 rows, *11th row:* Inc. in first and last st. (14). *12th row:* K. 5 rows. Rpt. these 6 rows 3 times (20). *35th row:* K. 2 rows. *37th row:* Inc. in first st. (21). *38th row:* Cast off 8 st., k. to end of row (13). *39th row:* K. 12 rows. *51st row: K. 2* tog. at each end of needle (11). *52nd row:* K. Rpt. these 2 rows once (9). Cast off. K. another in the same manner.

Tail.—1st row: With blue wool cast on 7 st., k. 4 rows. *5th row:* Inc. at each end of needle (9). *6th row:* K. Rpt. these 2 rows twice (13). *11th row:* K. 12 rows. *23rd row: K. 2* tog. in middle of row (12). *24th row:* K. Rpt. these 2 rows 3 times (9). Cast off. K. a similar piece in white wool.

To make up the rabbit, with a wire brush brush up each piece of knitting. Sew up the two pieces of the body, beginning at the throat over the face, head, and along the back, leaving about 3 inches open for stuffing. Sew in the white front of body, beginning at the throat, and along the sides. Sew up the blue leg and white inside, sew into the body. Sew up the arms and sew into armholes. Turn the work. Stuff well with kapok, making the animal look shapely. Sew up the opening. Sew one blue and white ear together, and sew on in position. Sew the two pieces of tail together, and sew on to animal. Sew in the black shoe buttons for eyes. Mark the nose and mouth with fine pink wool. For whiskers use white bristles from a brush. Smooth the rabbit down with the wire brush.



Knitted Toys. Fig. 2. Black Sambo and Jumbo. These little figures are in simple knitting and stuffed with kapok.

Black Sambo. Seen on the left of Fig. 2 is a fascinating doll known as Black Sambo. He costs about 2s. to make, and requires 1 oz. each of white, brown, red, and royal-blue wool (4-ply); one pair of knitting needles (size 11); a little black wool for the shoes; kapok.

The work begins at the head. *1st row:* With brown wool cast on 12 st., k. *2nd row:* Increase in first and last st. (14). *3rd row:* P. Rpt. these 2 rows twice (18). *8th row: K.* and p. for 10 rows. *18th row:* K. 2 st. tog. at each end of needle (16). *19th row:* P. Rpt. these 2 rows once (14). *22nd row:* Join on red wool for collar, k. Inc. in first and last st. (16). *23rd row: K.* Rpt. these 2 rows twice (20). *28th row:* Join white wool. Cast on 2 st., k. (22). Rpt. this row once (24). *30th row:* K. 30 rows. *60th row:* Join blue wool for trousers, k. 12 st., place the remaining 12 on a cotton for other leg. *61st row:* K. 23 rows. *84th row:* Join brown wool, k. 2 tog. at each end of needle (10). *85th row:* K. Rpt. these 2 rows once (8). *88th row:* K. 6 rows. *94th row:* Join red wool, k. 2 rows. *96th row:* Join white wool, k. 8 rows. *104th row:* Join black wool, k. 4 rows. *108th row:* K. 2 tog. at each end of needle (6). *109th row:* Cast off. K. another in the same manner.

For the Arm.—1st row: With white wool cast on 3 st., k. *2nd row:* Inc. in first and third st. (5). *3rd row: K.* Rpt. these 2 rows five times (15). *14th row:* K. 16 rows. *30th row:* Join red wool, k. 4 rows. *34th row:* Join brown wool for hand, k. 2 rows. *36th row:* K. 2 tog. in first and last st. (13). Rpt. this row three times (7). Cast off. K. another in the same manner.

The Cap.—1st row: With red wool cast on. 30 st., k. *2nd row: K. 1* and p. 1 to end of row. Repeat this row four times. *7th row:* Inc. in every other st. (45). *8th row:* P. Rpt. these 2 rows once (68). *11th row:* K. and p. for 12 rows. *23rd row: K. 2* tog. 12 times at even distances along the row (56). *24th row:* P. Rpt. these 2 rows three times (20).

Break off a length of wool and thread through all stitches on the needle, and draw up tightly and sew up the cap.

To make up the doll, sew up the work, leaving an opening at one side for the stuffing with kapok. Sew up the opening, seam up the arms, stuff and sew on to doll. To make the nose, make a stitch about ½ inch in the middle of face, and draw up tightly. Mark the eyes with white wool, and work the pupils with fine, black wool, and the mouth with red wool. Work the buttons down the front with red wool. Sew on the cap.

Jumbo. For the elephant Jumbo, which costs only 1s. 6d., 2 oz. of grey 4-ply wool are required, with a little red wool for the saddle-cloth and yellow Sylko No. 5; one pair of steel knitting needles, size 11; one steel crochet hook size 2½; two black shoe buttons.

1st row: Cast on 15 st., k. 2 rows. *3rd row:* Inc. 1 in first st., k. to end. *4th row:* Cast on 20 st., k. to end. *5th row:* Inc. 1 in first st., k. to end. *6th row: K.* Rpt. these 2 rows five times. *17th row:* K. 3 rows. *20th row:* Cast off 19 st., k. to end. *21st row:* K. 20 rows. *41st row:* Inc. 1 in first st., k. to end. *42nd row:* Cast on 19 st., k. to end. *43rd row:* Inc. 1 in first st., k. to end. *44th row:* K. Rpt. these 2 rows once. *47th row:* K, 11 rows. *58th row:* Cast off 25 st., k. to end. *59th row: K.,* knitting last 2 st. tog. *60th row:* K. Rpt. these 2 rows once. *63rd row:* K. 2 rows. *65th row:* K. 2 tog. at beginning of row. Inc. 1 in last st. *66th row: K.* Rpt. these 2 rows twice. *71st row:* K. 2 tog., k. to end. *72nd row:* Cast on 12 st., k. to end. *73rd row: K. 2* tog. twice at beginning, k. to end. *74th row: K.* Rpt. these 2 rows once. *77th row:* K. 2 tog. at beginning, k. to end. *78th row:* K. to the last 6 st., k. 2 tog. three times. Cast off. Knit another piece in exactly the same manner.

Underbody.—Cast on *2* st. *1st row: K. 2* rows. *3rd row:* Inc. 1 in each st. *4th row:* K. *5th row:* Cast on 23 st. for forelegs, k. to end of row. *6th row:* Same as 5th row. *7th row:* K. 14 rows. *21st row:* Cast off 19 st., k. to end of row. *22nd row:* Same as 21st row. *23rd row:* K. 20 rows. *42nd row:* Cast on 19 st., k. to end of row. *43rd row:* Same as 42nd row. *44th row:* K. 14 rows. *58th row:* Cast off 20 st., k. to end of row. *59th row:* Same as 58th row. *60th row:* K. 2 tog. at each end of needle. *61st row:* K. Rpt. these 2 rows once. Cast off.

Soles.—Cast on 3 st. *1st row; K. 2nd row:* Inc. 1 at each end of needle. *3rd row: K.* Rpt. these 2 rows once. *6th row: K.* 2 rows. *8th row:* K. 2 tog. at each end of needle. *9th row:* K. Rpt. these 2 rows once. Cast off. K. three more in exactly the same manner.

Ears.—1st row: K. Cast on 8 st. *2nd row:* Inc. 1 at each end of needle. *3rd row:* K. Rpt. these 2 rows twice. *8th row: K. 8* rows. *16th row:* K. 2 tog. at each end of needle. *17th row:* K. Rpt. these 2 rows three times. *24th row:* K. 1, k. 2 tog. twice, k. 1. Cast off. K. another in exactly the same manner.

Tail.—Cast on 8 st. *1st row:* K. 24 rows. *25th row; K.* 2 tog. at each end of needle. *26th row*; K. 2 rows. Rpt. these 3 rows once. Cast off.

Saddle Cloth.—Cast on 20 st. in red wool. *1st row: K. 2nd row:* P. Rpt. these 2 rows for 5 in. With the steel hook and yellow Sylko, work a double crochet all round the cloth.

Tusks.—Use two strands of 3-ply white wool. Make a line from the side of the face to the trunk, then work buttonhole fashion along the mark. Work the other side in the same manner.

To make up the animal, sew the two profile pieces together, leaving about 2 inches open in the middle of the back for stuffing. Sew on the underbody, beginning at the throat, along the forelegs, etc. Sew in the four soles. Now turn the work and stuff well with kapok, beginning at the trunk and head, making the trunk curl in at the end. Stuff the legs firmly, so that the animal will stand. Sew up the opening in the back. Sew on the ears and tail, using the black shoe buttons for eyes; mark the tusks, and stitch the saddle cloth at the four corners.

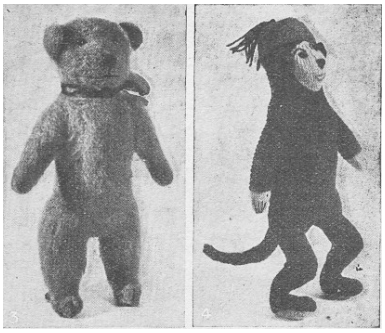


Fig. 3. Teddy Bear, knitted in fawn teazle wool.
Fig. 4. Koko the Monkey, made in brown and fawn wool, with a scarlet cap.

Teddy Bear. No nursery seems quite complete without this old-fashioned friend. Materials to knit one of a popular size cost only about 3s. It requires 2½ oz. of fawn teazle wool; 2 black shoe buttons; one pair of steel knitting needles size 11; ¾ yd. green ribbon 1½ in. wide for his necktie.

The work begins at the base of the body. *1st row:* Cast on 7 st., k. 18 rows. *19th row:* Inc. in first st. (8). *20th row:* K. Inc. in last st. (9). Rpt. these 2 rows twice (13). Break off the wool and put these 13 st. on a safety-pin. Now k. from 1st row to 24th row. Pick up the 13 st. from the safety-pin, and k. them. You should now have 26 st. on your needle. This makes the opening for the legs to be sewn in. *25th row:* K. 2 rows. *27th row:* Inc. at each end of needle (28). *28th row: K. R*pt. these 2 rows once (30). *31st row:* K. 20 rows. *51st row:* K. 13 st. Put these on a safety-pin, cast off 4 st. for armhole, k. remaining st. (13). *52nd row:* K. *53rd row:* K. 2 tog., k. to end (12). *54th row:* K. 3 rows. Rpt. these 4 rows once (11). *61st row:* K. 4 rows. *65th row:* Inc. in first st. (12). *66th row:* K. Rpt. these 2 rows twice (14). Place these on a safety-pin, pick up the 13 st. from the safety-pin, that were left for the front of chest. *71st row:* Joining wool to where the 4 st. were cast off, k. 1 row. *72nd row:* K., knitting last 2 st. tog. (12). *73rd row:* K. 3 rows. Rpt. these 4 rows once (11). *80th row: K.* 4 rows. *84th row: K.* Inc. in last st. (12). *85th row:* K. Rpt. these 2 rows twice (14). *90th row:* K. 2 tog., k. to end of row. Now pick up the 14 st. from the safety-pin, and k. them, knitting last 2 st. tog. (26).

91st row: K. *92nd row: K. 2* tog. at each end of needle (24). *93rd row:* K . *94th row:* K. 2 tog. at beginning, middle, and end of needle (21). *95th row:* K. Rpt. these 2 rows once (18). *98th row: K.* 2 rows. *100th row:* Inc. at beginning, middle, and end of needle (21). Rpt. this row once (24). *102nd row:* Inc. in first st. (25). *103rd row:* K. Rpt. these 2 rows 3 times (28). *110th row: K.* 10 rows. *120th row: K. 2* tog. at each end of needle (26). *121st row: K.* Rpt. these 2 rows 4 times (18). *130th row:* K. 2 tog. at each end of needle (16). Rpt. this row 3 times (10). Cast off. K. another piece in the same manner.

Headpiece.—1st row: Cast on 3 st, k. 2 rows. *3rd row:* Inc. in first and last st. (5). *4th row: K.* 3 rows. Rpt. these 4 rows 3 times (11). *19th row: K.* 22 rows. *41st row: K.* 2 tog. at each end of needle (9). *42nd row:* K. 5 rows. Rpt. these 6 rows twice (5). *59th row:* K. 12 rows. *71st row: K.* 2 tog., k. 1, k. 2 tog. (3). *72nd row:* K. Cast off.

Leg.—1st row: Cast on 22 st., k. 8 rows. *9th row: K. 2* tog. twice at each end of needle (18). *10th row:* K. Rpt. these 2 rows once (14). *13th row:* K. 2 rows. *15th row:* Inc. at beginning, middle, and end of needle (17). *16th row: K.* Rpt. these 2 rows 6 times (35). *29th row: K.* 16 rows. *45th row: K. 5* st., place these on a safety-pin. Cast off 3 st., k. to end of row (27). *46th row: K.,* knitting last 2 st. tog. (26). *47th row:* K. 3 rows. *50th row:* K. 2 tog. at each end of needle (24). *51st row: K.* Rpt. these 2 rows 5 times (14). *62nd row* . K. 2 tog. at each end of needle (12). Rpt. this row once (10). Cast off. Now pick up the 5 st. from safety-pin, k. 2 rows, k. 2 tog., k. 1, k. 2 tog. (3). K. Cast off. K. another piece in the same manner.

Arms.—1st row: Cast on 15 st., k. 2 rows. *3rd row:* Inc. at beginning, middle, and end of row (18). *4th row:* K. 7 rows, *11th row: K.* 2 tog. at each end of needle (16). *12th row: K. 3* rows. *15th row:* Inc. in first and last st. (18). *16th row: K. 3* rows. Rpt. these 4 rows twice (22). *27th row:* Inc. in first and last st. (24). *28th row:* K. Rpt. these 2 rows twice (28). *33rd row: K. 2* rows. *35th row:* K. 5 st., put these on a safety-pin. Cast off 3 st., k. to end of row (20). *36th row:* K. , knitting last 2 st. tog. (19). *37th row:* K. 3 rows. Rpt. these 4 rows once (18). *44th row:* K. 2 tog. at each end of needle (16). *45th row:* K. Rpt. these 2 rows twice (12). *50th row:* K. *2* tog. at each end of needle (10). Rpt. this row once (8). Cast off. Now pick up the 5 st. from the safety-pin, and k. 2 rows. K. 2 tog., k. 1, k. 2 tog. (3). K. Cast off. K. another piece similarly.

Ears.—1st row: Cast on 6 st., k. 1 row. *2nd row:* Inc. in first and last st. (8). *3rd row:* K. Rpt. these 2 rows twice (12). *8th row:* K. 10 rows. *18th row:* K. 2 tog. in middle of row (11). Rpt. this row 3 times (8). Cast off. K. another in the same manner.

To make up the bear, brush up each knitted piece well with a wire brush. Sew the two pieces of body together, beginning at the base of the front. Sew along the neck to the nose. Sew in the headpiece, placing where the 3 st. were cast on to the nose, and sew along the top of head to neck. Sew along the back, leaving about 2 inches open for stuffing. Sew up the arms and sew into armholes. Sew up the legs and sew into openings. Turn the work, and stuff well with kapok, pressing the stuffing well into the legs and arms with a knitting needle to make them firm. Sew up the opening that was left for stuffing. Sew on the ears. Sew in the two shoe buttons for eyes. Mark the nose and mouth with fine black wool, also mark the feet and paws. Smooth the bear down with the wire brush. Tie the ribbon round his neck.

Koko the Monkey. For this toy, which costs about half a crown, 1 oz. of pale fawn 4-ply wool; 3 oz. 4-ply brown wool; ½ oz. 2-ply red wool; one pair of steel knitting needles size 11, and 2 black shoe buttons are required.

The work begins at the base of body. *1st row:* With brown wool cast on 6 st., k. 10 rows, *11th row:* Inc. in last st. (7). *12th row:* K. 11 rows. *23rd row:* Inc. in first st. (8). *24th row: K.* Inc. in last st. (9). Rpt. these 2 rows twice (13). Put these 13 st. on a safety-pin. Now k. another piece from 1st row to the 28th row. Pick up the 13 st, from the safety-pin, and k. then. You should have 26 st. on your needle. This makes the openings for the legs to be put in. *25th row:* K. *26th row:* Inc. in first st. (27). *27th row:* K. Rpt. these 2 rows once (28). *30th row:* K. 26 rows. *56th row:* K. 12 st., put these on a safety-pin for the chest. Cast off 4 st. for armhole, and k. the remaining st. (12). *57th row:* K. *13* rows. *70th* row: Inc. in first st. (13). *71st row:* K. Put these 13 st. on a pin. *72nd row:* Pick up from the safety-pin the 12 st. that were left for the chest. Joining wool to where the 4 st. were cast off, k. 13 rows.

85th row: K. Inc. in last st. (13). Pick up the 13 st. from the pin and k. them (26). *86th row:* K. *87th row:* K. 2 tog. at beginning, middle, and end of row (23). *88th row:* K. Rpt. these 2 rows once (20). *91st row:* K. 2 rows. *93rd row:* K. 2 tog. Inc. in middle and end of needle (21). *94th row:* Inc. in first and middle st., k. last 2 st. tog. (22). *95th row:* K. 2 tog., k. to end of row (21). *96th row:* K. Rpt. these 2 rows 5 times (16). *107th row:* K. 2 rows. *109th row:* Inc. in first st. (17). *110th row:* K. Rpt. these 2 rows twice (19). *115th row:* Inc. in first st., k. last 2 st. tog. (19). *116th row:* K. Rpt. these 2 rows twice. *121st row:* K., knitting 2 tog. in middle and end of needle (17). *122nd row:* K . *123rd row:* K, 2 tog. at beginning, middle, and end of needle (14). Rpt. this row twice (8). Cast off. K. another piece in the same manner.

Leg.—The work begins at the foot. *1st row:* Cast on 36 st., k. 6 rows. *7th row:* K. 2 tog. at each end of needle (34). *8th row:* K. *9th row:* Cast off 10 st., k. to end (24). Rpt. this row once (14). *11th row:* Inc. in first st., k. 2 tog. in middle of row. Inc. in last st. (15). *12th row:* K. Rpt. these 2 rows 11 times (26). *35th row:* K. 2 rows. *37th row:* K. 2 tog. at beginning of row. Inc. twice in middle of row, k. last 2 st. tog. (26). *38th row:* K. Rpt. these 2 rows 4 times (26). *47th row:* K. 2 tog. at beginning. Inc. twice in middle of row, k. last 2 st. tog. (26). *48th row:* K. Inc. twice in middle of row (28). Rpt. these 2 rows 3 times (34). *55th row:* Inc. in first st. (35). *56th row:* K. 5 st., put these on a safety-pin. Cast off 8 st., k. the remaining st. (22). *57th row:* Inc. in first st., k. last 2 st. tog. (22). *58th row:* K. Rpt. these 2 rows once (22). *61st row:* K., k. last 2 st. tog. (21). *62nd row:* K. 3 rows. Rpt. these 4 rows once (20). *69th row:* K. 2 tog. at each end of needle (18). Rpt. this row 6 times (6). Cast off. Now pick up the 5 st. from the pin, joining wool to where 8 st. were cast off. K. 2 rows. K. 2 tog., k. 1, k. 2 tog. K. Cast off. K. another in the same manner.

Arms.—1st row: Cast on 4 st. with brown wool, k. *2nd row:* Inc. in first and last st. (6). *3rd row:* K. Rpt. these 2 rows 6 times (18). *16th row:* K. 28 rows. *44th row:* Join fawn wool for hand, k. *45th row:* P. Rpt. these 2 rows once. *48th row:* K. 2 tog. at beginning, middle, and end of row (15). *49th row:* P. Rpt. these 2 rows twice (9). Cast off K. another in the same manner.

Ears.—1st row: With brown wool cast on 9 st., k. *2nd row:* Inc. in first and last st. (11). *3rd row:* K. 4 rows. *7th row:* K. *2* tog. at each end of needle (9). *8th row:* K. Rpt. these 2 rows once (7). Cast off. K. another in the same manner.

Tail-.—1st row: With brown wool cast on 4 st.; k. *2nd row:* Inc. in first and last st. (6). *3rd row:* K. Rpt. these 2 rows 4 times (14). *12th row:* K. 16 rows. *26th row:* K. *2* tog. at each end of needle (12).

27th row: K. 14 rows. Rpt. these 15 rows twice (8). *55th row:* K. 2 tog. at each end of needle (6). *56th row:* K. 6 rows. Cast off.

Soles for Feet.—1st row: With fawn wool cast on 4 st., k. These are worked in stocking-stitch. *2nd row:* P. *3rd row:* Inc. in first and last st. (6). *4th row:* P. Rpt. these 2 rows once (8). *7th row:* K. *8th row:* P. Rpt. these 2 rows 4 times. *19th row:* K. 2 tog. at each end of needle (6). *20th row:* P. Rpt. these 2 rows once (4). Cast off. K. another in the same manner.

Face.—1st row: With fawn wool cast on 6 st., k. This is worked in stocking-stitch. *2nd row:* P. *3rd row:* Inc. in first, middle, and end st. (9). *4th* row: P. Rpt. these 2 rows 5 times (24). *15th row:* K. *16th row:* P. Rpt. these 2 rows twice (24). *21st row:* K. 2 tog. at beginning, middle, and end of needle (21). *22nd row:* P. Rpt. these 2 rows 3 times (12). *29th row:* K. 2 tog. 6 times (6). *30th row:* P. Cast off.

Cap.—1st row: With red wool cast on 60 st., k. 28 rows. *29th row:* K. 2 tog. to end of row (30). *30th row:* K. 3 rows. *33rd row:* K. 2 tog., k. 5 st. Rpt. this to end of row (25). *34th row:* K. *35th row:* K. 4 st., k. 2 tog. Rpt. this to end of row; k. 1 st. (20). 36*th row:* K. *37th row:* K. 2 tog., k. 3 st. Rpt. this to end of row (17). *38th row:* K. *39th row:* K. 2 tog. to end of row, k. 1 st. (9). *40th*

row: K. Break off a length of wool and thread through all the 9 st., and draw up.

To make up the monkey, sew up the body to the throat. Sew over top of head, and along the back, leaving about 2 inches open for stuffing. Sew in the fawn face, placing where stitches were cast on to the neck. Sew along the sides. Sew up the arms and sew into armholes. Sew up the legs and sew in the fawn soles. Sew legs into the openings. Turn the work. Stuff well with kapok, pushing the kapok well into the head and limbs with a knitting needle. Sew up the opening that was left for stuffing. Sew on the ears. Sew in the shoe buttons for eyes, mark the nose and eyebrows with fine black wool. Mark the mouth with red wool. Sew up the tail. Stuff lightly with kapok, and sew on to animal. Mark the hands with black wool. Sew up the red cap, drawing all the stitches together. Make a tassel of a few strands of black wool. Stitch the cap on to the monkey's head.

KNITTING: STITCHES AND PATTERNS

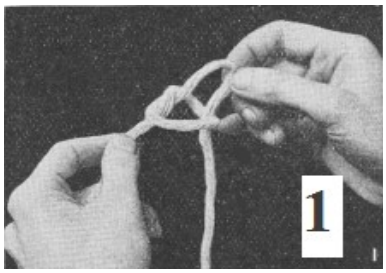
How to Obtain Both Simple and Fancy Effects

This general outline of the principles of knitting suggests reference to the entries on Glove; Stocking; Sock. See also the companion articles, Crochet and Needlework.

Knitting consists of loops or stitches formed by means of two needles when working a flat piece, or four or more needles when working in a round. Through connecting the stitches in one continuous piece an elastic fabric can be produced. In its earliest stage knitting was practically limited to making stockings in a flat piece on two needles, which were afterwards sewn up; from this, knitting stockings in a round was evolved, avoiding the back seam, and fastening off at the toe.

The first process is casting on the stitches. Hold the short end of the wool in the left hand, take the main length in the right hand and pass the latter over the short end, so that it forms a loop. Bend the main length of wool under this loop, keeping the latter in position with the thumb and forefinger of the left hand, and pass it up through the loop so that it forms a complete stitch, as in Fig. 1. Pass this loop on a knitting needle and draw up the wool closely until the loop just fits the needle. Hold this needle in the left hand, and take the working needle in the right hand. Twist the length of wool round the third finger of the right hand, and allow it to pass over the first finger of that hand as the work proceeds. The tightness or looseness of the wool and how it is held over the third finger determine the tension of the knitting, and it is only by an even tension that good work can be produced.

One stitch is now on the needle. To make further stitches, put the right-hand needle from left to right through the loop on the left-hand needle, pass the wool round the point of the right needle, bring it through the single loop, Fig. 2, and draw it out until it is long enough to pass it over the point of the left-hand needle, when another stitch will be produced. Continue this operation until enough stitches are on the needle.



Knitting. Fig. 1. How to make the first stitch out of a loop in casting on.

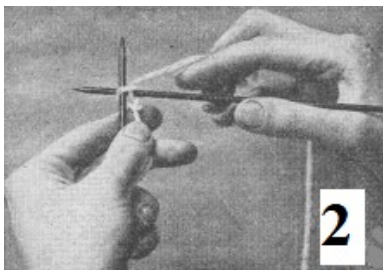


Fig. 2. Making the second stitch with the needles. This also shows how the right-hand fingers regulate the tension of the wool during work.

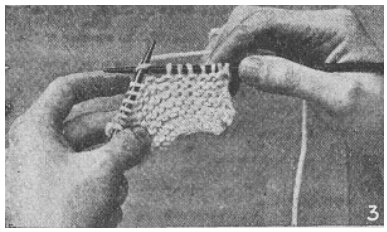


Fig. 3. Plain knitting, producing garter stitch, in progress.

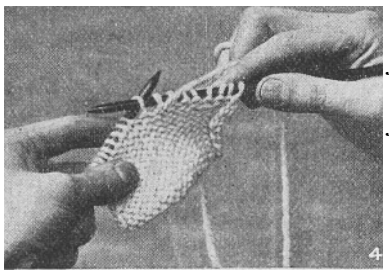


Fig. 4. Purl stitch, first stage, with working thread in front of needle.

Plain and Purl Stitches. To work the first row of plain knitting, take the needle containing the stitches in the left hand; put the right-hand needle into the first stitch from left to right, and pass the wool round the right-hand needle as described for casting on. Draw the loop through, and with the right-hand needle pass the first stitch off the left needle, as the new stitch now remains on the right needle. Repeat this action to the end of the row, and if these rows are continued little ridges will be seen on the work, two rows making one ridge. Fig. 3 shows this stitch, known as garter stitch, in progress. To make a neat edge on a piece of knitting, work the first row through the back of the loops.

The next form of knitting is known as purling. This is used to produce the reverse side of the stitch just explained. If stocking web is wanted (smooth on the front side, not ridged on both sides, as with garter stitch), the back row must be purled. Put the right-hand needle through the stitch from right to left (Fig. 4), with the working thread to the front of the needle. Pass the thread over and round the right-hand needle and back to the front again; then let the right-hand needle pass through the loop of the stitch, while the latter slips off the left-hand needle. Fig. 5 shows the

second action with the wool round the needle.

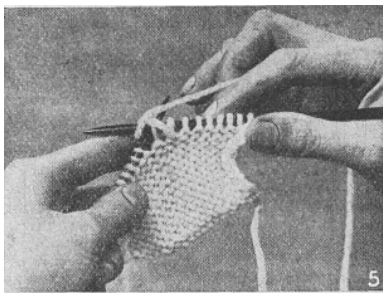


Fig. 5. Purl stitch, second stage, wool round needle.

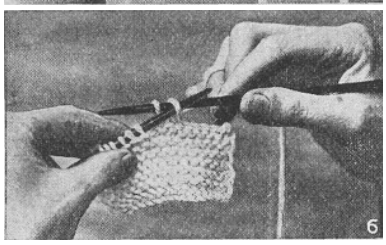


Fig. 6. Casting off.

Casting Off. The chief method of casting off the stitches is shown in Fig. 6. Knit two stitches as usual, then put the point of the left-hand needle, left to right, through first stitch knitted, and lift it over second stitch and point of the right-hand needle, letting it drop right off needles. Knit next stitch on left needle, so that you again have two stitches, on right needle, and again pass the first one over the second. Repeat until there is only one stitch left; then cut wool and pass it through remaining stitch and fasten in the end with a darning needle.

If a loose casting off is wanted, knit two stitches together by inserting the needle from right to left through the two stitches together instead of one only; then knit them in the ordinary way, when one stitch will result on the right-hand needle. Now pass this stitch back again to the left-hand needle and knit it together with the next stitch, and again pass the resulting stitch back to the left-hand needle, and continue to the end of the row, when a loose edge will be the result. This particular edge bears a resemblance to a cast-on edge as near as possible.

Increasing and Decreasing. The next step to learn is how to increase and decrease stitches for the purpose of forming a piece of knitting into a different shape, such as the leg of a stocking that has to be narrowed towards the ankle. There are two methods of decreasing. At the beginning of a row the decrease is generally formed so that it turns towards the centre of the row, thus: slip one stitch by simply passing it off the left-hand needle on to the right, without passing the thread round it. Knit the next stitch, when there will be two stitches on the right-hand needle, and lift the slipped stitch over the knitted one with the point of the left-hand needle. This is usually referred to as the slip, knit, and draw-over method.

If a decrease is wanted at the other end of the same needle, two stitches should be knitted together as described above, and these are usually the second and third stitches from the end, so that there will be one stitch to knit at the end after the decrease. If possible, avoid decreasing right at the end of a row, as it makes an uneven edge, and in the case of a jumper or similar garment does not make a neat seam when the two edges are sewn together. Fig. 7 shows a piece of stocking web knitting decreased at both ends of the row.

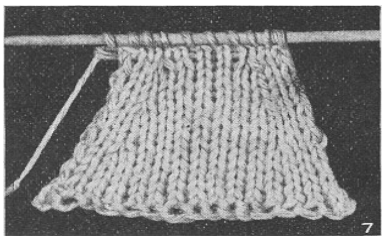


Fig. 7. Piece of stocking web decreased at both ends.

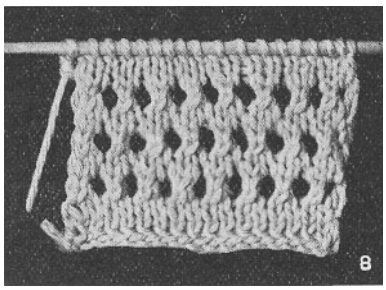


Fig. 8. Pattern resulting from made stitches with stocking web between.

To increase, a stitch can be knitted into twice to make one extra. Knit in the usual way through the front of a stitch, then knit again through the back of the same loop before passing it off the left-hand needle, and two stitches will result. Another method is to lift up the loop immediately under the first stitch on the left-hand needle and knit it; or knit one and purl one in the same stitch.

A "made" stitch is not really an increase, as this term should be used in fancy patterns only, to produce a hole, and usually a stitch is decreased directly after it to restore the balance of the stitches. To produce a made stitch before a knitted stitch, simply bring the wool to the front of the needle, so that it passes over the latter when knitting the next stitch, and a straight loop results on the right-hand needle. When working the next row this made loop is knitted like an ordinary stitch, and a complete new stitch results. To make two stitches in this way the thread is passed round the needle twice, then when working the next row a stitch must be knitted and purled in the made loop, otherwise one of the made stitches will be lost. Fig. 8 shows an openwork design based on made stitches with stocking web between.

When knitting in a round for such articles as stockings or children's gaiters without side seams, the stitches must be divided equally on three or more needles, and a fourth one taken for the working needle. At the end of the round the wool must be drawn up very closely so that a gap does not occur between the needles, and when beginning a new needle put the latter in the first stitch of the next needle behind the needle that has just been worked, otherwise a little gap will appear at the beginning of every fresh needle, and this would produce a ladder right down a stocking. A flexible circular wire with points at both ends is often used for knitting jerseys and other tubular garments.

When knitting in rounds, stocking web is obtained by working every round in plain knitting, instead of plain and purl alternately.

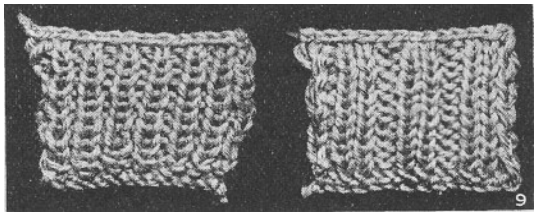


Fig. 9. Specimens of single and double ribbing, for tops of stockings.

Ribbed knitting is used for the tops of stockings, hems and necks of jerseys, for sleeve edges, and for any position where contraction is required, as the ribs cause the knitting to fit closely. In the case of stockings that are ribbed all the way down, the welt, usually about 3 in. deep is worked in a different rib from the rest of the stocking, generally a single rib of knit one and purl one alternately. Double rib is two knitted and two purled stitches worked alternately, and a variety of rib designs can be formed. Fig. 9 shows specimens of single and double rib.

Joining Wool. In the course of a large piece of work, joining new wool or thread is sure to be done. When the first ball is getting near the end, stop when there is about 8 in. left, take the new ball and lay the two ends together, knit one stitch with the two ends, then knit the following stitches with the new and the old ball alternately. In knitting stockings or any stocking web in a round, this join will only be visible on the inside, so on a flat piece of stocking web, worked on two needles, the join should be done when working a right-side row so that the alternate threads are passing on the wrong side.

Another method of joining is by twisting the new thread over the first as each stitch proceeds. Put the needle in the stitch of knitting, then, holding the end of the new ball down with the fingers on the left hand, pass the short end under, then over, the new wool, so that the latter is encircled with the old end, then use the new wool to knit the stitch. Twist the old wool over the new ball for about 12 stitches and leave the short end of wool to be sewn down afterwards.

The only place in which a knot is allowed is at the end of a row when a fancy pattern is being worked, and which would be spoiled with an ordinary joining. If the knot is tied right up to the edge of the knitting it can be hidden when joining up the side seams. A knot is never allowed in stocking knitting.

To make a chain edge on a piece of flat knitting, the first stitch must be slipped purl-wise, and the last stitch should be knitted through the back of a loop instead of through the front in the ordinary way. This edge is used on the flap of a stocking heel, each chain being picked up afterwards when turning the heel to represent one stitch. It can be employed on the armholes of jumpers, if the sleeve stitches are to be picked up in the same way.

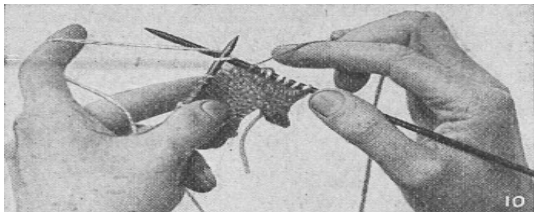
Double knitting is done on two needles, and is worked so that when the flat piece is completed it has two distinct halves that can be pulled apart like a bag, but they are caught all round the edges. It is a useful pattern for scarves where extra warmth is required, as stitches can be cast on for any width and the piece continued for any length. Two stitches are usually knitted single at the beginning and end of each row, so an even number of stitches should be cast on to begin with.

Knit one plain row, then proceed thus: Knit two stitches, bring the wool to the front of the needle, slip a stitch as if for purling, pass the wool back again, and knit the next stitch. Repeat these two stitches alternately to the end of the row, except the last two stitches, which are knitted plain to match the beginning. Continue this row for any length required, and it will be noticed that in the second row the slipped stitch is knitted, and vice versa, which thus causes the two distinct sides of the bag.

Fancy Designs. Brioche knitting is a fancy rib, and for this the number of stitches cast on must be divisible by three. To work it, bring the wool to the front of the needle and slip one stitch purlwise; knit together the next two stitches, and repeat this alternate movement to the end of the row. Every row is worked in the same manner, and in succeeding rows the two stitches that cross each other are always knitted together.

Two-colour knitting is chiefly stocking web, using two colours of thread in the same row to form a design. Sometimes six colours or more are used in one design, but two are usually confined to one row, as the different colours have to be carried along the row during the work. The first movement is shown in Fig. 10. The second wool which is not in use is held over the first finger of the left hand as for crochet, and in the first step it is passed over right-hand needle, before the working wool is passed over that needle to knit the stitch. This catches the spare wool in with the stitch. The second stitch is knitted in the ordinary way, but holding the spare wool on the left finger away from the stitch. The wool not in use passes through every alternate stitch, and is only slightly visible at the back.

When working coloured stripes in ribbing, say at the hem of a jersey, one plain row should be worked with the new wool on the right side of the work each time the colour of the wool is changed. This plain row will sink in the ribbing and give the work a neater ap-pearance where change of colour is effected.



Knitting in two colours. Fig. 10. First position, with second wool passed over right-hand needle before working wool.

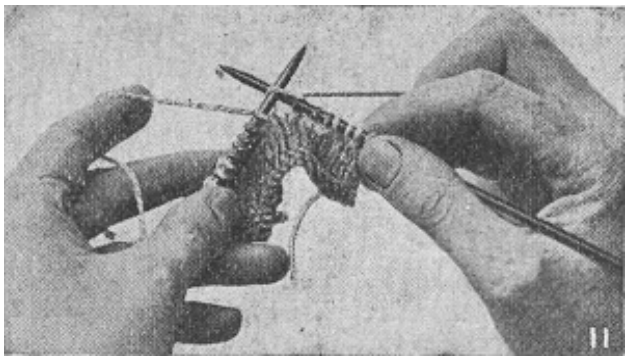


Fig. 11. Second position, showing second wool held on left forefinger away from stitch.

Grafting. Two pieces of knitting can be joined together so that the join is quite invisible, and quite flat. It is usually employed for finishing off the toes of socks and stockings.

In the case of a stocking toe the stitches would be equally divided on two needles, one being placed behind the other, with wrong sides facing. The thread should be cut off, leaving about 18 in. hanging for a stocking toe, or longer, according to the number of stitches to be grafted together. Pass the thread into a darning needle and, beginning on the front row—that is the row nearest to the worker— put the darning needle in the first stitch as if for knitting, pass the stitch off the knitting needle and draw up the thread, but not too tightly. Put the darning needle in the second stitch as if about to purl, draw the thread through while this stitch is on the knitting needle, and do not slip it off.

Go to the back needle and reverse the action. Put the needle in the first stitch as if about to purl, draw the thread through and slip this stitch off the needle; put the needle in the second stitch as if about to knit, and draw the thread through, but do not slip the stitch off the needle. Repeat until all are taken off. The thread must not be drawn tightly.

The method of grafting above described can be memorised thus: knit and slip off, purl and keep on; purl and slip off, knit and keep on. This includes the two needles.

Knitting Needles. Knitting needles are sometimes referred to as pins or wires. They are divided into two classes: steel needles, which are made in the finer sizes, and bone needles for the coarser sizes. The latter includes aluminium, celluloid, ebonite, and amongst patent materials are metal tubings coated with nickel silver or other material.

Knitting needles are made in standard sizes and can be tested on a bell gauge (q.v.), No. 1 being very coarse, No. 2 slightly less coarse, and so on. The higher the number the finer the needle. The usual sizes employed for knitting jumpers and dresses range from No. 8 to No. 12, but for very thick wools sizes coarser than No. 8 may be employed. The average sizes used for knitting socks and stockings are from No. 12 to No. 15. For very loose meshed knitting, there are needles in sizes larger than No. 1, No. 0, for instance, being larger than No. 1, and No. 00 larger than No. 0. These "outsize" needles are usually in wood or cane.

Steel knitting needles are sold in paper packets in sets of four, and bone in pairs of two and sets of four, some with knobs on for flat pieces of work, and the sets with points at both ends for knitting round or tubular garments. Thicker needles can be bought in a variety of colours, so it is well to use dark needles for light thread and vice versa.

When buying bone needles they should be carefully inspected to see that there are not any flaws, as the tiniest chip will split silk and wool. When a flaw does occur it can be smoothed away with fine glasspaper. This also applies to the point of the needle, which should not be too sharp.

Wooden needles can be treated with glass-paper and given a perfectly smooth finish. Celluloid needles are always smooth, but should not be used for very heavy work as they bend easily. Aluminium needles soil light wool, and should be used only for dark materials; those made from brass tubing coated with nickel silver are light in use, and do not soil the work.

Knitting shields can be bought cheaply for protecting the points of the needles when not in use. They are made in pairs attached by elastic or a spring. In shape the shield resembles a thimble, into which the needles fit.

Knitting Wool. All wools have a certain ply, whether it be 2, 3, or 4 ply, and so on, the word ply meaning the number of threads which compose the thickness of the wool in each case; but a 4-ply fingering produces a garment about half the size of a 4-ply thick wool, using exactly the same number of stitches and following also the same directions. There are numerous fancy wools on the market, but the following are the main standard kinds:

Fingering, which is the kind in most general use, is divided into Scotch, super-fingering, and the cheap varieties. All these are employed for stockings, children's dresses and coats, jumpers and underwear. Cheap fingerings are harsh and do not give the same warmth or comfort in wear as the super-fingering.

Vest wool is about the thickness of Scotch fingering of the same ply, 2, 3, or 4-ply, but it has a softer finish, being specially made for underwear.

Soft knitting is sold in packets and is so labelled. Wheeling or Alloa yarn is a distinctive yarn of 3-ply thickness, usually sold in 2 oz. skeins, 8 of which form a head of 1 lb. When of good quality it is suitable for heavy socks and stockings, as it is much thicker than 4-ply fingering, although one ply less.

Double knitting is a 4-ply wool about twice as thick as 4-ply fingering, and similar in weight and thickness to a good wheeling, although of much better quality and appearance, as well as softer to the touch.

Another wool which is very thick, though made in a two-ply twist, is the "quick-to-knit" type of wool that is intended for speedy knitting on large-sized needles.

Zephyr wool is equivalent to the old Berlin wools, and is sold in the same thicknesses, namely, single

Berlin 4-ply, and double Berlin 8-ply; it is particularly soft and full in the thread, and is more suitable for indoor articles, as its smoothness and softness do not allow for the friction of hard wear.

Shetland Wool is the name of a very fine 2-ply wool, finer than 2-ply fingering, and receives its name from the Shetland Isles where very fine shawls, underwear, and jumpers are made. Andalusian is the standard name for a soft 4-ply wool twisted in a similar manner to soft knitting, but finer in size owing to the twist. Sold in 1 oz. packets, it is chiefly used for children's garments and for socks.

Knocker. *See* **Door.**

KNOCK KNEE. In the common deformity known as knock-knee the legs diverge from one another below the knees so that the latter tend to knock against each other in walking. The affection may begin in early childhood, being then almost always due to rickets; or it may come on between the ages of 12 and 18 years. Weak boys or girls who carry heavy weights are very liable to suffer. Pushing a heavy wheelbarrow, for example, may cause the deformity. A child showing signs of knock-knee should not be permitted to crawl or walk. It should lie down as much as possible in the open air and sunshine, and be properly fed.

In many cases these measures alone will remove the deformity, but it is generally desirable to apply pressure. This can be done by putting a soft pad between the knees, so as to separate the lower ends of the thighbones, and bandaging the ankles together.

The legs must be massaged daily, and manipulated in a way the doctor will direct. The boot heel should be made higher on the inner than on the outer side, and, when walking, the feet should be turned in a little.

In the cases which develop later in life, a metal splint from the heel of the boot to the outer prominence of the hip may be used. But the deformity, if pronounced, can be removed by a surgical operation. *See* **Knee.**

KNOP. This term is used for the knobs found at the handle end of old spoons and sometimes for those on the covers of drinking and other vessels. A familiar example is the apostle spoon, while the acorn is often found figured as a knop. Knops are also the rounded protuberances found in the stems of wine glasses. *See* **Glass Ware; Spoon.**

KNOT: In Timber. A knot is a hard part of the wood occasioned by the growth of a small branch, which, by growing out at an angle to the normal grain of the tree, causes one set of fibres to cross the other, thus forming a hard spot, very difficult for the amateur to deal with.

When the worker purchases ordinary prepared timber which has already been machine planed, it will be found preferable to use it in that condition if the material is at all knotty, rather than attempt to plane it up. It is not always possible to do this, as the machined surfaces are not all smooth enough for the purpose for which the timber is required. In such a case, one course to adopt is, when planing, to set the plane iron very fine, so that it makes a very fine shaving, and to press it firmly upon the surface of the work, especially when planing over the knots.

It may be as well, when a good surface is required, to cut the knot away bodily. In some cases, such as when the wood is thin, it will be found that the knot can be driven down through the wood with the aid of a small punch and hammer. If this is the case, the hole can then be enlarged with a twist drill, and plugged with a circular piece of wood which should be glued and driven in tightly. When the knots are running more or less with the surface of the timber, a recess should be chiselled out with the edges slightly undercut, and a new piece of wood cut and fitted into it with the grain running in the same direction as the rest of the timber. These pieces should be properly glued in and allowed to set hard. The timber can then be easily prepared.

Whenever possible, knots should be avoided by selecting timber that is not prone to this trouble, such as American whitewood, Californian redwood, beech, and similar timber, which can be obtained in sufficiently large pieces to avoid the presence of a knot altogether.

Knots in Paintwork. In paintwork, the presence of knots is very objectionable, as they contain a kind of resinous material which may ruin the paint if not specially treated. For this purpose various compositions are prepared, known as knotting. This should be brushed over the surfaces of the knots, prior to the application of the paint, and when the knots are very numerous, two coats or more of knotting will be better than one. The surface may then be prepared in the usual way. *See* **Wood.**

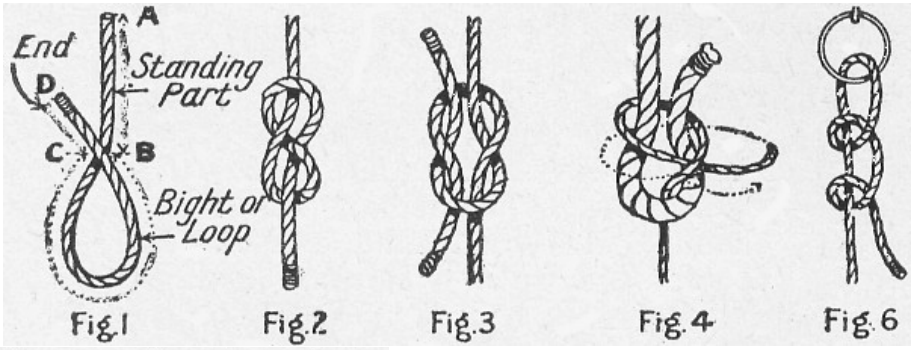
KNOT: How to Tie. (For illustrations of knots see next page. Knots may be divided into the simple ones that are tied every day by ordinary persons, and the more elaborate ones that are used for various purposes by sailors and others who need something much stronger in the course of their work.

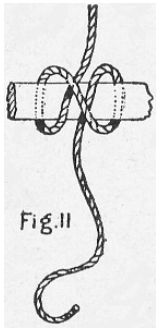
The illustrations on next page show how the knots in common use, and also some of the more elaborate ones, are tied. Some of these, e.g. the timber hitch, are only used for certain special purposes, but others are useful in everyday life, and the more difficult among them can usually be tied after a little practice.

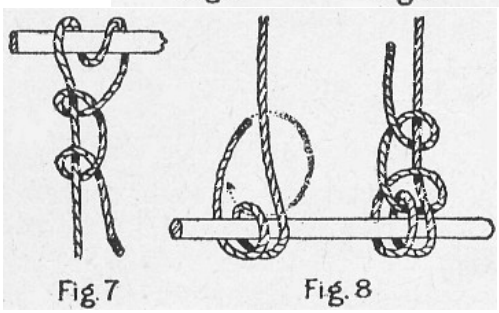
Fig. 1 shows a common loop by which most knots are commenced, with its parts lettered for reference. The upper part A to B is called the standing part of the rope, B to C the loop or bight, and C to D the end. When the end is drawn through the loop, the simplest of all knots, a half hitch, is formed.

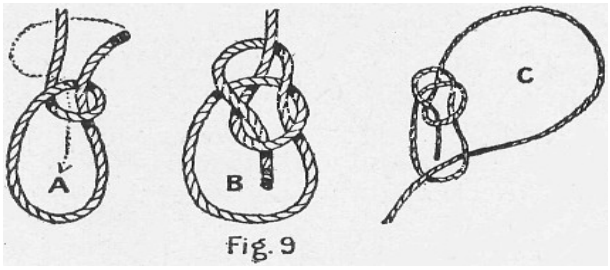
A figure-of-eight knot, Fig. 2, is made by forming a loop, placing the end behind the standing part and finally over and through the loop and pulling taut. This knot is useful for making a stop on a rope to prevent the end fraying or slipping through a block. A reef-

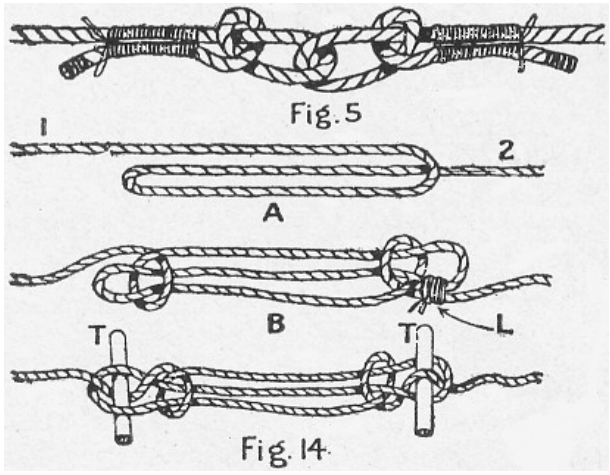
(Continued in page 1206)

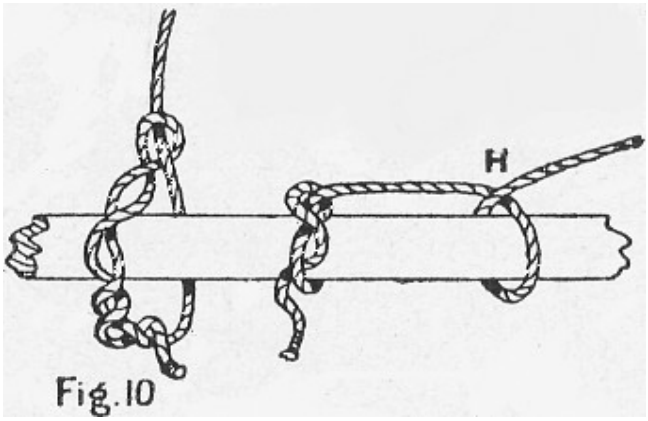


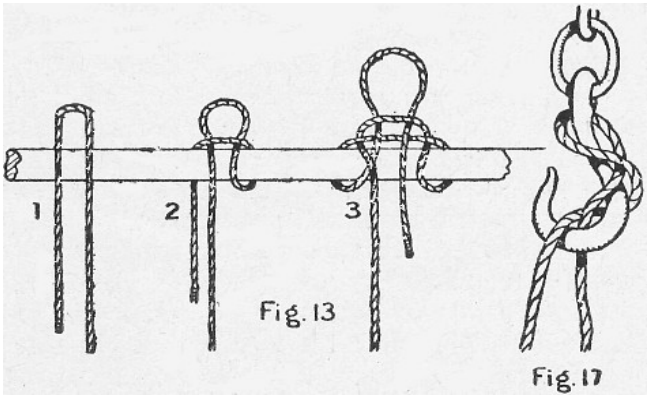


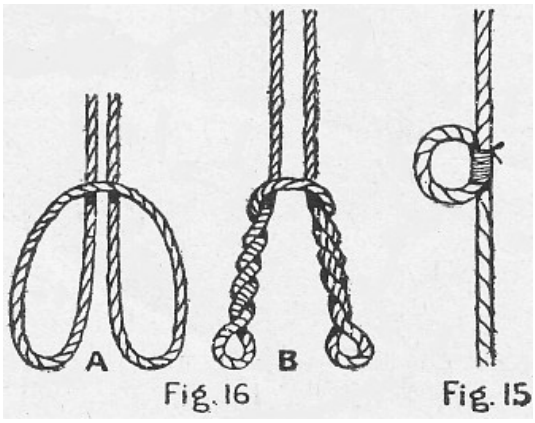


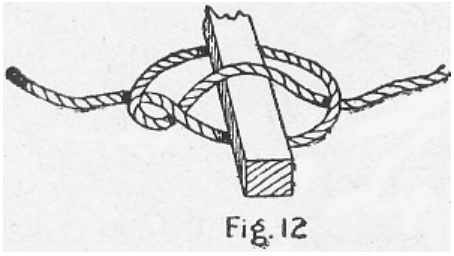












Knot. **Various types of knots useful to the handyman.**
Fig. 1. Loop. Fig. 2. Figure-of-eight. Fig. 3. Reef. Fig. 4. Single sheet bend. Fig. 5. Hawser bend. Fig. 6. Two half hitches. Fig. 7. Round turn and two half hitches. Fig. 8. Fisherman's bend. Fig. 9. Bowline and running bowline. Fig. 10. Timber hitch.
Fig. 11 Clove hitch. Fig. 12. Lever hitch. Fig. 13. Draw hitch. Fig. 14. Sheepshank.
Fig. 15. Simple clinch. Fig. 16. Catspaw. Fig. 17. Double hook hitch. See explanation in text.

knot, Fig. 3, is the simplest and best of all knots for tying together two ropes of equal size. A single sheet bend, Fig. 4, is a good method of joining two ropes of unequal sizes, and if the ropes are wet, or likely to be so, the knot can be made still more secure by again passing the end of the thin rope round the loop on the other, as shown by the dotted lines.

A hawser bend, Fig. 5, should be used when two thick ropes or cables require to be joined. A half hitch is formed on one rope and the end tightly lashed with strong cord to the standing part. The end of the second rope is passed through the loop on the first and secured in the same way. Two half hitches, Fig. 6, are made on a rope to fasten it to some object, to finish a lashing or form a noose. This is a good knot for general use.

A round turn and two half hitches, Fig. 7, are employed for tying a rope on which there will be a great strain so that the hitches shall not jam. For fastening ropes to posts, raising heavy beams, weights, etc., it will be found of great service. Two turns of the rope are taken round the post or beam, and then two half hitches are formed on the standing part and drawn taut. If there is an excessive or jerking strain increase the hitches or lash the end down.

The fisherman's bend, Fig. 8, which should be distinguished from the fisherman's knot, will be found useful in making fast where there is a give-and-take motion, or a varying strain on the rope, as in drawing water from a well with a bucket, tethering cattle, attaching anchors, stays, etc. A bowline, Fig. 9, is made on a rope to form a loop or noose which will not slip. It is used when a permanent loop is required at the end of a rope, or to attach to other ropes. A running bowline or slipknot can be formed by drawing the standing part of the rope into the loop.

The Timber Hitch. A timber hitch, Fig. 10, is chiefly used for holding timber, etc., where the weight will keep the hitch tight. The knot consists simply of a half hitch made with a rather long end, which is twisted back again round the loop. In cases where there is to be a continuous strain or the timber requires to be kept pointing steadily in one direction, a half hitch should be added as at H. A clove hitch, Fig. 11, makes a good knot for commencing and finishing the lashing together of poles, beams, etc. As it will not slip, it can be attached to another rope or pole and still leave the end free for further use.

A lever hitch, Fig. 12, is a simple way of fastening a rope to a lever worked by a windlass or to piles, stakes, ree-stumps, etc., which are to be drawn out of the ground by horses or power. It is very handy for fixing the rounds of a rope-ladder. The draw hitch shown in Fig. 13 is of great service in securing a rope to a post, ring or other rope, in such a way that it can be instantly released. The diagrams 1, 2, and 3 show its formation. This knot will resist a give-and-take motion and can be released by jerking the end.

A sheepshank, Fig. 14, is used to shorten a rope. To make it, take up the length desired and fold it as in A. Then with parts 1 and 2 form a half hitch round each loop as in B. Wooden toggles can be inserted for further security, as at T, or the loops can be lashed to the standing parts of the rope as at L. A simple clinch, Fig. 15, is a small loop or ring formed on the rope and held together by tightly lashing with strong cord. For attaching a block, lantern, etc., it will be found very handy.

A catspaw, Fig. 16, makes a temporary loop for hooking on a block or supporting another rope. It is formed by first making two loops as at A and then twisting them up as in B; bring the two eyes together and insert the hook of the block or pass the rope to be suspended through them. To make a double hook hitch, Fig. 17, take the loop of the rope or sling and place it over the upper part of the hook, crossing it behind, then place the under rope over the hook and cross the upper part over it, and draw both taut. This hitch will hold a weight more securely than any other form of hook knot. *See* Clove Hitch.

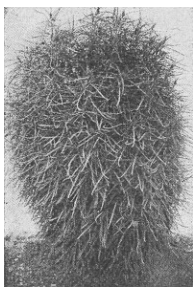
KNOTWEED. This is the popular name of polygonum, a large group of hardy plants, some of which are very decorative. *See* Polygonum.

KNUCKLEBONES. This game, also called chuckstones, five stones, dibs, jackstones, and hucklebones, is played with five or six small objects, the aim being to throw them in various ways. The objects, originally the knucklebones of a sheep, are usually of metal; but small stones or pieces of wood will serve almost equally well.

Of the several games, one consists in throwing up one of the pieces, and, while it is in the air, picking up one or more of the others from the table, continuing until all have been picked up. For this six stones are usually employed, the one thrown being called the jack. Another game is to throw up one piece and catch it on the back of the hand, following with two pieces, then with three, and so on until, if possible, the five are thrown and caught together. Special names are given to some of these throws, such as peas in the pot and horses in the stable.

Knuckle Joint. *See* Rule Joint.

KOCHIA. This half hardy annual, from 18 to 24 in. high, of graceful, bushlike growth, is valued for its light green leaves, which turn reddish purple in autumn. It is known as the summer cypress and is often used in summer bedding, where it contrasts finely with flowering plants. The seedlings are raised in a heated glasshouse in February or March, are potted singly in small pots, and are planted out of doors in May or early June. Pron. Kō'-ci-a.



Kochia, or Summer Cypress, valued for its graceful pale green foliage.

KODAK. This name is applied to cameras and other photographic products made and sold by the Eastman Kodak Company. It is generally understood to refer to roll-film cameras. *See* Camera; Developer; Film; Photography; Plate.

KODOL: A Developer. This photographic developer, which is made by the Eastman Kodak Co., is a single solution of the paramidophenol type, clean working, non-staining and without liability to fog. It is equally suitable for plates, films, bromide papers and gaslight papers. In ordinary dish development by the visual method, 1 dram of Kodol is used for every 3 oz. of water.

Development should be full, since there is a tendency for a certain amount of density to be lost in the fixing bath. Where the negative is known to be over-exposed, increase the strength of the developer taking 1 dram of Kodol for 2 oz. water, with the addition of 2 or 3 drops of potassium bromide.

If it is certain that the plate is underexposed use a weaker solution, 1 dram of developer to 5 oz. water.

Tables for development by the time and temperature methods have been prepared by the Kodak Co., from whom the preparations may be obtained.

For developing bromide papers the following proportions are required:

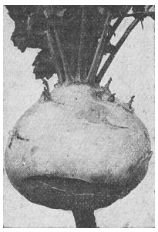
Kodol	1 dram
Waterto	4 oz.
Potassium bromide 10 per cent solution	1 drop

Development will be complete at normal temperatures in 2 min., if exposure is correct. If exposure is insufficient it is useless to attempt to obtain detail by prolonging development. For gaslight papers Kodol is used in the following strengths:

	Vigorous paper	Soft paper
Kodol	2 drams	1 dram
Water	3 oz.	3 oz.
Potassium bromide, 10 per cent solution	3 drops	1 drop

With vigorous gaslight papers development should be complete in 30 sec.; with the soft variety it will take perhaps 40 sec. *See* Developer; Developing; Film; Photography.

KOHL RABI. This somewhat coarse vegetable proves useful as a substitute for turnips during hot dry weather when it is difficult to provide the latter. It is raised from seed sown out of doors in April or May in rows 18 in. apart, the seedlings being thinned out to about 12 in. from each other. The greenish white variety is to be preferred to the purple one.



Kohl Rabi, a useful summer substitute for turnip.

KOLINSKI. This is a yellowish-brown and orange-red fur obtained from the Asiatic mink. Cheap in price, it is usually dyed to represent sable, for which it makes a satisfactory substitute. It is used extensively for trimmings and wraps, and among furriers is known as red sable. The hairs from kolinski tails are widely used for making into artists' sable brushes.

KOUMISS. This is the name given to fermented mare's milk, a pleasant acid drink, very digestible and slightly alcoholic. A kind of koumiss can also be made with cow's milk according to the following recipe:

Fresh cow's milk	2 quarts
Water	½ pint
Fresh buttermilk (that obtained from churning whole milk)	½ pint
Loaf sugar	1 ounce

The above should be mixed in a gallon jar. Afterwards cover the vessel with a cloth, and put it in a warm place for 30 to 36 hours, shaking the vessel every four hours; it is then ready for use. Some of this artificial koumiss can be used instead of buttermilk to make a fresh quantity.

Koumiss is a nourishing drink when an irritable stomach will retain no other food. It is useful in fever, albuminuria, disorders of the stomach and intestine, and whenever ordinary milk cannot be well digested. It is slightly laxative and diuretic.

KROMESKIE. This term is used to describe a dish made from a mixture of fish or meat enclosed in rashers of bacon, coated with batter and then fried.

KRONA PEPPER. Though not so strong as cayenne, this is also a red pepper. It is made from a capsicum pod known as the Hungarian paprika and is sometimes also known as paprika pepper. *See* Pepper.

KUMMEL. The Russian and German liqueur which bears the German name of the herb cumin is made with sweetened spirit flavoured with cumin and caraway seeds. Its distinctive flavour is mainly due to the caraway seeds. The Russian variety of Kummel was formerly made at Riga, but is now manufactured in Norway and Sweden.

LABEL: Its Uses. Adhesive or gummed labels and tie-on labels or tags are the two kinds most commonly used in the household. They can be obtained from any stationer, and are often sold in packets containing a dozen or more of each.

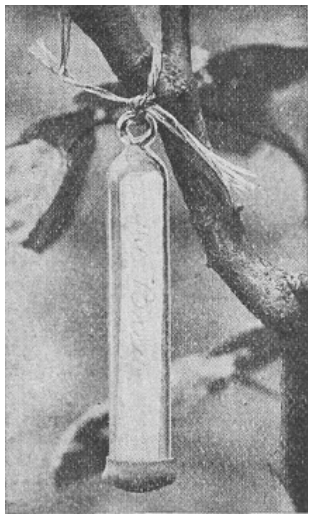
Tags are made of manilla or other strong, durable paper, cut roughly to 5 in. by 2½ in. and other sizes, with an eyelet through which string is passed. They are used for parcels of all kinds sent by rail or post, and for labelling luggage, being generally tied to the handles of traveiling cases, trunks, and bags. Distinctive labels are an advantage when sorting out luggage at a railway station. Large oval tags in a variety of bright colours

are obtainable which can easily be recognized. It is a good plan to choose a particular colour and always keep to it for luggage labels.

Adhesive labels are employed for similar purposes, and are often more convenient, but are more liable to get torn or rubbed off in transit than the tag.

Labels should be addressed in a bold, clear handwriting, so that they can be easily and quickly read by anyone who may have to handle the luggage or parcels. Very often only the town to which the traveller is bound appears on the label, and this no doubt suffices in most cases: but it is safer to give the full address in case of accident. Amongst other varieties is the label used for distinguishing the keys of different rooms, which are made of bone and attached to the key by split rings of metal.

Gardening Labels. Garden labels used to indicate the names of each plant are of rolled zinc or plain wood. The former may be purchased with raised letters on a black ground. Garden labels may also be obtained from some automatic machines, which punch out any desired combination of names or letters upon strips of aluminium.



Label for Plants, consisting of flat glass tube, containing a piece of oiled paper with the written name, attached by a ring to the plant or tree.

Wooden labels may be made at home from strips of wood about 1 in. wide. The surface of the wood should be well rubbed with a piece of chalk to fill the interstices, and the writing should be done with an indelible pencil.

Always start writing the name of the plant at the top of the label. Wooden labels which it is desired to render as permanent as possible should be given a coat of copal varnish or white paint.

Labels for trees are usually made of tin, painted and tacked on. They should be placed at a height of about 5 ft. from the ground.

A special kind of label consists of a small, flat glass tube which is closed at one end, where there is a ring by which it is attached to the plant. The name of the plant is written clearly on a piece of oiled paper, and this is placed in the tube, being held in position by a small rubber cap which fits tightly over the open end.

Photographic Labels. The bottles containing photographic chemicals should always be labelled to avoid mistakes, either in ordinary photographic operations or by confusion with domestic bottles. It is useless to attempt to gum a piece of paper on the side of a bottle containing chemicals, since it will quickly become stained and illegible.

One method is to glue the label, and when dry cover the face of the label with thin glue, finished off with a coat of copal varnish. It will then be impervious to moisture and to the action of any chemicals. Another method is to rub down the front of the bottle with emery-powder until a ground-glass surface is obtained. On this any name can be written or printed in Indian ink or waterproof ink, covered afterwards with a coat of transparent shellac varnish or even with clear wax.

The amateur photographer should make it an inviolable rule to label every bottle, tin or other receptacle that contains chemicals of any kind. *See* Lettering; Luggage.

LABOUR SAVING IN THE HOME
Ideas of Value to the Busy Housewife

This article, of necessity general in its scope, is supplemented by the entries on the various domestic fitments and appliances mentioned therein, e.g. Service Hatch; Vacuum Cleaner. See also Dining Room; Housekeeping; Kitchen; Laundry; Spring Cleaning.

Modern buildings are naturally better fitted for labour saving than older houses designed when economy of work would hardly even have been considered a domestic virtue. Smaller houses built on the square are planned with as few steps as possible. Jointless flooring for kitchens, parquetry, linoleum or rubber floorings for other rooms, skirtings with rounded corners so that dust does not collect where it is difficult to remove, shelfless chimney pieces, casement windows that can be cleaned from inside, ample cupboard accommodation in the kitchen and bedrooms and on the landings, gas or electric fires or radiators throughout the house, electric lighting with convenient power plugs for various electric-run devices, fittings such as taps and door handles of chromium plate, porcelain or other material which does not require cleaning, lavatory basins in bedrooms with hot and cold running water: these are all important labour-saving points, many of which architects now incorporate in the home.

Where there is no electric power or gas available, coke, anthracite and oil are all brought into the labour-saving scheme of things with new inventions. Slow combustion fires and the modern grates are aids where coal is used and so also is access to a coal store from the kitchen instead of having to go outside for fuel, especially in bad weather.

Making meal service more efficient can save many footsteps. The trolley wagon is a useful help, and the service hatch and lift are excellent where situation of rooms and circumstances allow. Labour-saving furniture for the kitchen includes specially fitted cabinets, cupboards, sinks, and porcelain metal table surfaces. Modern bathrooms are easy to keep clean. Baths are made with enclosed sides, so that there is no space underneath for dust to collect and the waste

pipes and traps of lavatory basins can be well raised from the floor in order that the space underneath may be easily accessible for mop or duster.

Cleaning Equipment. The selection of labour-saving cleaning implements and gadgets is almost bewildering. To be of real utility such devices should be simple in construction, easy to clean, and not liable to get out of order. The cost of any apparatus should be considered along with the amount of service required, e.g. a good electric iron is worth purchasing, as it will be constantly needed; whilst an elaborate tin opener is not necessary, although it may be more convenient and easier to handle than the simple one already in use. Any appliance that will do work better, quicker, and with less labour than the housewife can do it is always worth procuring. A vacuum cleaner comes under this category, provided a reliable one is purchased. The daily use of a suction cleaner rids curtains, carpets and upholstery of dust.

Intelligent and careful housewives get the most value out of all such aids, employing the various attachments to search dirt out of every corner and from hitherto seldom cleaned pelmet or valance. Long-handled scrubbers and floor mops, short-handled mop dusters, a great variety of brushes with labour-saving curves and adjustable heads for particular purposes save much stooping and uncomfortable body angles while working.

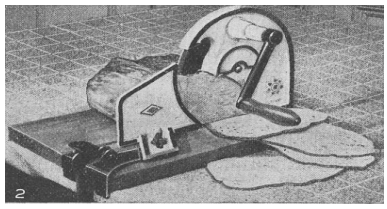
A floor polisher such as the one illustrated in Fig. 1 is an excellent electric aid. Owing to the carefully designed brush action no brush marks are left on the surface of the floor. The brushes for polishing and rubbing up are quickly interchangeable and special buffers obviate all possibility of damage to furniture or walls. Quick drying of polish and a highly glazed surface are secured by passing warm air through the motor direct to the floor surface. It can be used on parquet and linoleum.

An electric dish washer is a great convenience for a large family, but is not worth the trouble of cleaning for the washing up of a few plates and dishes. Many housewives have found a clothes washing machine a good investment. Hire purchase system over twelve or eighteen months makes it possible to own one without capital expenditure. A washing machine and a good electric iron form a laundry in miniature, and where much family washing is done at home justify their expense and are a great saving of time and labour. For the small kitchen a combined cookery table and ironing board is obtainable. The latter is stowed away out of sight when not in use. A clothes airer with an adjustable frame and wooden laths which can be fitted to the kitchen ceiling and lowered to any position is also a useful time-saver. The frame projects only 7 inches from the ceiling when pulled up. The efficient disposal of rubbish can be easily effected by a gas in-cinerator where there is no range. There are also good designs in garbage pails with inner containers which can be lifted out to empty. One make has an inner pail that is perforated so that moisture drains away from rubbish, and in this way makes the latter sufficiently dry for burning.



Labour Saving. Fig. 1. Electric floor polisher. (Courtesy of Electrolux, Ltd.)

The Preparing of Food. In addition to the implements and machines for cleaning, there are those to do with the preparation of food. A refrigerator lessens labour in the summer by enabling the housewife to turn out very easily prepared and dainty cold dishes or iced sweets for the table. These refrigerators operated by gas, electricity or paraffin are extremely simple to use, and not only render food more wholesome, but save the housewife the labour of constantly bringing in fresh supplies of foods that quickly deteriorate in the ordinary larder.



Labour Saving. Fig. 2. Bread slicing machine in stainless steel which also cuts bacon.

A bread slicing machine (Fig. 2) which will also cut bacon and possesses a stainless steel blade is a useful device for the larger household. It is also of great practical help in sandwich making. The fruit or tomato cutter shown in Fig. 3 is inexpensive and ingenious. It is worth possessing, together with a cucumber slicer in the salad season. A potato peeling machine is another exceedingly useful aid for the housewife who has to prepare large family meals.

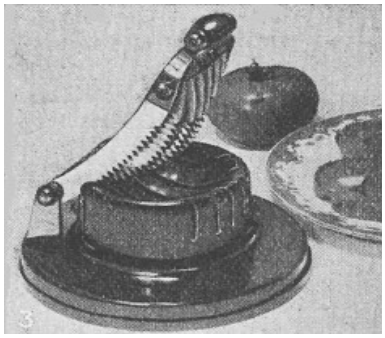


Fig. 3. Fruit and tomato cutter; the serrated edges of the stainless steel blades require no sharpening.

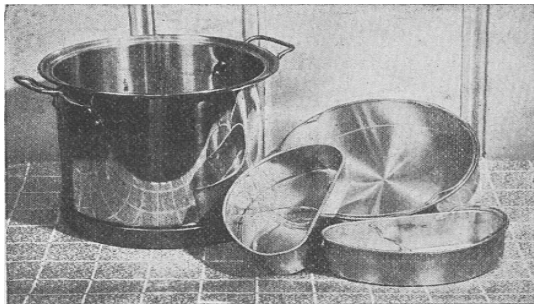
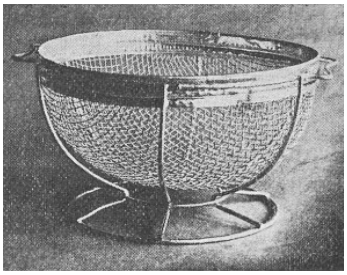


Fig. 4. Aluminium cooker which requires no water. A complete meal can be cooked at the same time in separate utensils in one container. (Courtesy of Staines Kitchen Equipment Co.)

Labour saving low-pressure cookers and steamers are many. The cooker shown in Fig 4 requires no water and a whole meal can be cooked at once in separate utensils placed in the one aluminium container. Obviously a saving not only of labour but also of fuel is effected by employing this simple device. Low-pressure cookers simplify the preparation of meals, and entire dinners can be cooked thus on one gas ring. In such cookers the flavours and vitamins of the food are preserved. A household machine that may be useful in the larger home is one which reverses the ordinary process and turns butter and milk back to cream. The operation is quite simple and enables the housewife to procure rich cream in a few minutes at about one-fifth of dairy cost.



Labour Saving. Fig. 5. Vegetable strainer for use inside a saucepan.

The smaller labour saving devices in-clude mincing ma-chines and vege-table strainers. The latter provide excellent substitutes for colanders and save work, heat and time. The strainer illustrated in Fig. 5 fits into the saucepan and can be easily lifted out when the vegetables are cooked.

Work is simplified by using the best cleansing materials available. Excellent polishes, soaps and powders are on the market and many recipes of good cleaning agents are given in our work, from which wide range it should be interesting to test and select the most suitable for the particular work on hand.

Where funds permit it is a good plan to replace all household equipment as it wears out with the best and most modern labour-saving kind on the market. These are not all simple and easy to work at sight, and it is advisable for the housewife to find out exactly how to use even the smallest appliance, or the result may be the reverse of labour saving.

Easier Ways. If all the best electrical appliances were installed, the work of running a house would be minimized very considerably. But it is a fact that these ideal conditions exist for a very few only, and that many housewives have to make shift with houses that are badly planned and often poorly equipped. Housekeeping, however, is essentially a business, and as such must be carried on in a methodical way with as many of the labour-saving devices mentioned as are practicable to the particular household, and plenty of ingenuity to make up for lack of expensive equipment where instalment of this is out of the question. In many homes the labour spent in cleaning metal is out of all proportion. The taps and front door brasses admittedly should look as if they receive daily attention, but there are satisfactory ways of minimizing the cleaning. Before coating the taps and door brasses with clear varnish or lacquer they should be well cleaned with ordinary metal polish and rubbed very hard with a soft cloth, so that all trace of metal polish is removed before the varnish is applied. Metal lacquers are made for this purpose by some of the large paint manufacturers. It is better to apply two coats of lacquer, as it does not then require to be renewed oftener than every six months.

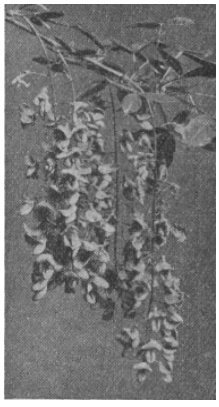
Letter boxes and knockers made in wrought iron to imitate old designs can be bought for a few shillings, and thus do away with brass door furniture. Stainless steel knives for table and culinary purposes abolish the labour of the knife board. Aluminium and enamel kitchen ware are easier to clean than the old-fashioned iron and copper, which require scouring. Aluminium ware is quickly cleaned with a wet cloth dipped in an abrasive powder. Ornamental collections of brass in sitting-rooms should be lacquered. Labour is also saved when patent clips are used for stair carpets instead of metal rods.

Table mats instead of cloths are a saving when laundry is done at home. For the service wagon, or for dressing table in weekend cottage or bungalow, tray cloths and runners in bright-coloured American cloth ornamented with simple designs in raffia save labour, as they merely require wiping over with a clean damp duster. A rubber apron hanging inside a kitchen cupboard that is quickly put on saves changing an afternoon dress to wash up the tea or dinner things.

Labour saving is also intelligently achieved by method in catering and in keeping the contents of the store cupboard adequate for both ordinary and sudden needs. Last, but not least, much less energy is required to do things the right way than the wrong, and if the correct postures are adopted while working. When doing any sedentary work such as mending house linen or darning it is most important to sit well back in the chair so that the spine is properly supported.

When pastry making, ironing or doing other standing jobs, it is important not to stoop continuously over the work, but to take an opportunity to brace the shoulders. While stooping, stand a little away so that the stoop comes from the waist and not from the shoulders. When using a long-handled broom, mop or vacuum cleaner, use the body muscles as well as the arms, swaying from the waist with each movement. Not only is the work better done if you put your back into it, but it is also far less tiring and thus labour saving.

LABURNUM. A very beautiful summer-flowering tree, the laburnum is suitable for cultivation in town or country gardens. Trees may be planted at any time from November to March inclusive, given favourable weather and soil.



Laburnum. Drooping sprays of the beautiful flowering tree.

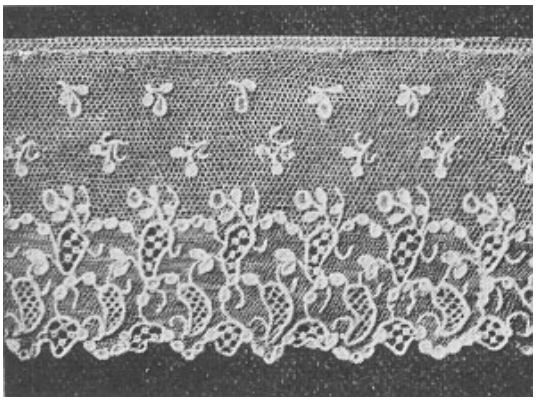
The laburnum tree is most effective where the flowers are shown up against a dark background. The Austrian pine, the copper-leaved beech, and the purple nut are instances of trees and shrubs which show the laburnum to advantage. Although there are few species or wild types of laburnum (the Scotch, Laburnum alpinum, and the common, Laburnum vulgare, are the chief ones) there are many varieties of hybrids, and some of them have much finer flower bunches than others: the best are Vossii, Parksii and Watereri. One named Alschingeri, which blooms later than the others, is also to be recommended. Laburnum Adami is a remarkable tree, obtained by grafting the purple broom (Cytisus purpureus) on the common laburnum: it bears both yellow and purple flowers. Laburnums flourish in ordinary soil and are increased by seeds, the named varieties by grafting.

Uses of the Wood. This wood is dark brown in colour, with a greenish shade towards the heart, and has a broad yellow sapwood. Being very hard, close in the grain, and capable of a good polish, it is used in turnery work and in inlaying. Much of the furniture before and during Queen Anne's reign was beautifully inlaid with laburnum. *See* Inlaying; Wood.

LACE AND LACE MAKING
Beautiful Examples and Practical Directions

In the first part of this article the different types of lace are classified and suggestions given for the care and repair of valuable pieces. The second part deals with simple directions for lace making. See also the entries on Crochet; Embroidery; Filet; Hairpin Work; Insertion; Linen; Richelieu Work.

A lace may consist of two distinct parts: the net ground on to which the design is worked, as in Alençon (Fig. 1), or of the pattern only without a ground, but connected by threads, as in guipure (Fig. 2). It may be classified under three headings: needle-point; bobbin; and machine-made.



Lace. Fig. 1. Part of a border of Alençon lace, an example of 17th cent. French needle-point.

Where only a single-threaded needle is used in the making, the lace is known as needlepoint; when a number of threads are wound on to bobbins, so that the twistings and plaitings of the threads form the pattern, the lace is called bobbin. The term point alone should not be taken to mean needle-made, as it is used to express either lace of the finest qualities and also for modern hand-worked laces in which lace braids are used and formed into designs by means of connecting buttonholed bars, and other lace stitches. Bobbin lace is sometimes termed pillow, but this leads to confusion, as needle-point laces are also sometimes worked on pillows.

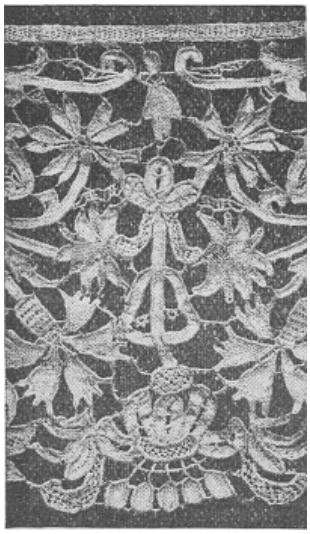


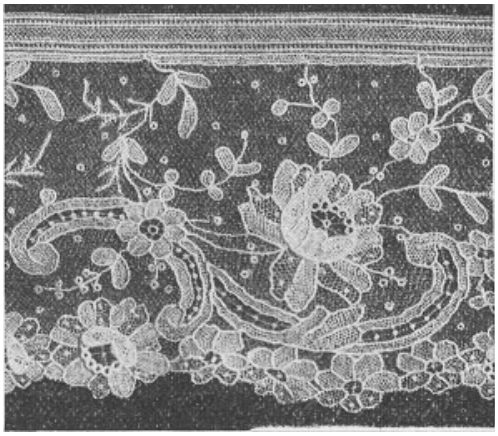
Fig. 2. Guipure. Specimen of 17th cent. punto in aria, a type seen in many of Vandyk's pictures.

Needle-point Laces. Italy may claim the introduction of needle-point laces, and certainly their finest workmanship. Venice points inspired the French laces of Argentan and Alençon, which resemble each other, a heavy outlining cord to the pattern being a feature of both, but the Argentan is considered the finer work. Only the Alençon is made to-day, chiefly at Burano, in Italy. The 19th century Alençon, which is often on sale in old lace shops, has spots or tiny sprigs powdered over the net ground, a floral pattern in running festoons and a conventional bordering pattern. In the modern lace these powderings are occasionally used with real flower patterns. It is an exquisite lace of rare delicacy and charm, and wears well.

The earlier heavy Venice needle-points have no net ground. The pattern is traced on parchment stitched to a linen backing. The lines of the design are sewn on to the foundation in a skeleton pattern, which is buttonholed over, and these outlines are filled in with elaborate lace stitches. When this is complete the lace is cut away from both foundations. In rose or raised Venice point the outlines are heavily padded by threads and then worked over. As the demand for lighter laces grew, the needle-point guipures were evolved (this lace is frequently also made with bobbins), and then the point on net ground which inspired the French laces of Alençon and Argentan, and also the Brussels point de gaze (Fig. 3), an exquisitely fragile needle-lace showing the powdered ground in the 19th century designs. Venetian lace was also copied in Russia and called point de Moscow, while in the varieties of cut work and drawn-thread laces the Russians frequently introduced oriental colourings.

Needle-points chiefly made to-day are Alençon, Burano point, Brussels point de gaze, rose point de Venise, and Greek point. A great quantity is still beautifully worked in the old designs and stitches in Italy, some in Belgium and Ireland, but not much else-

where. Limerick laces are of three types: a beautiful cut-work; a run lace, in which a running design is needleworked on the net, as illustrated in Fig. 4; and tambour, in which a chain-stitch is employed. The last-named was hand-made on a tambourine-shaped holder which held the net flat while being stitched, but is so easily copied by machinery that it is hardly ever now made by hand. The Venice points are largely reproduced in fine Irish crochet.



Lace. Fig. 3. Specimen of point de gaze, an exquisite needle-lace with powdered ground and raised cord outline to the pattern.

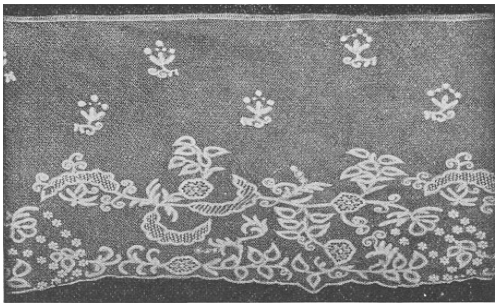


Fig. 4 . Limerick lace of the type in which a running design is needleworked on the net. (Courtesy of Haywards (Bond Street), Ltd.)

Carrickmacross lace is of two kinds. One, an example of which is shown in Fig. 5, has a delicate design which is appliqué on net, the other is a cut-work guipure made by tracing the pattern, outlining it with stitches on fine lawn, and cutting out after working in bars to hold the pattern together. Needle-point is sometimes used in conjunction with bobbin lace, as in some designs of the Honiton sprigs, and needle-point filling stitches have been used with machine-made braid mounted on machine-made net.



Fig. 5. Carrickmacross. Characteristic design with pattern appliqué upon net.

Bobbin Laces.

In bobbin laces the pattern is drawn or traced on to parchment and is then pricked with pins on to the cushion, the pins being placed to guide the threads. On the upper part of the pattern the ends of the bobbin threads are fastened, and as the threads are unwound the bobbins are thrown and twisted with regulated movements to plait the threads round the pins and form the ground and pattern of the lace with a variety of combinations. Most of the English laces are worked with bobbins.

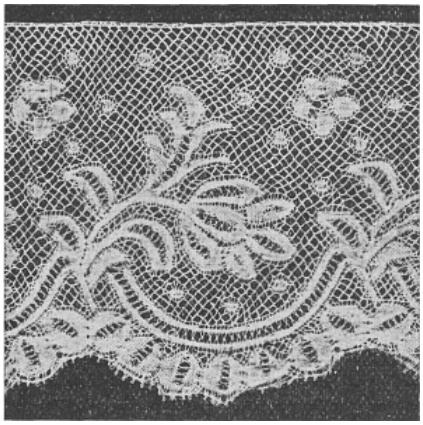


Fig. 6. Honiton. In this beautiful example the design of flowers and butterflies is connected, not by a net foundation, but by bars of twisted thread.

Copies of Lille, Valenciennes, Maltese laces, guipures and torchons are produced in Bedfordshire, Buckinghamshire and Northamptonshire, while a good deal of Honiton bobbin lace is still made in Devonshire, chiefly in the form of sprays or sprigs to be mounted on machine-made net grounds. The best type is a guipure with a corded outline consisting of a number of motifs joined by bars of twisted thread. An example is shown in Fig. 6. A kind of Honiton lace is known as Devonia, the speciality of which is the raising of flower petals or insect wings so that they stand away from the net ground. The bobbin laces of other countries are well copied by convent workers in Ireland.

A great deal of bobbin lace is made in Belgium, including torchons, Cluny, wire-ground Valenciennes, and the beautiful Malines or Mechlin laces. The first two named are in simple patterns and a somewhat coarse thread is used. Valenciennes made from fine linen thread is a flat lace without any raised design. The machine-made varieties are quickly detected by the even mesh of the ground. Fig. 7 shows the slight variations in the handmade net. Mechlin lace is sometimes confused with Valenciennes, but a magnifying glass reveals the mesh of the ground net to be made by plaiting and not merely by twisted threads.

A bright corded thread outlines the floral motifs and accents the designs of this lace. In the bobbin-made Brussels lace relief is also given to the flowers and leaf veinings by a raised plaited outline Bruges duchesse point resembles the Honiton guipure. Other duchesse lace is on net in fine designs such as the example shown in Fig. 9.



Lace. Fig. 7. Specimen of Valenciennes, a flat lace hand-made from linen thread.

In France, a black silk and linen thread lace is made at Chantilly. The net work of the ground is oval in these laces and the pattern is outlined with a thicker thread. Most of them are now machine-made. In Normandy Valenciennes laces are made, and black silk bobbin guipures at Le Puy. In Spain silk lace is made for mantillas in black and white. Maltese lace is made by hand in Malta in both silk and thread, and the best patterns have portions of the design in high relief.

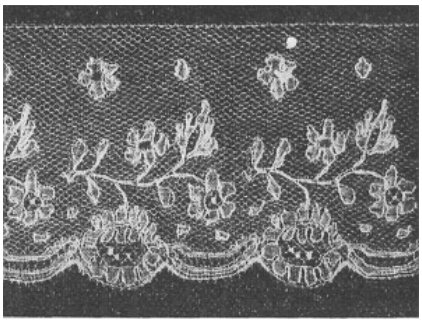
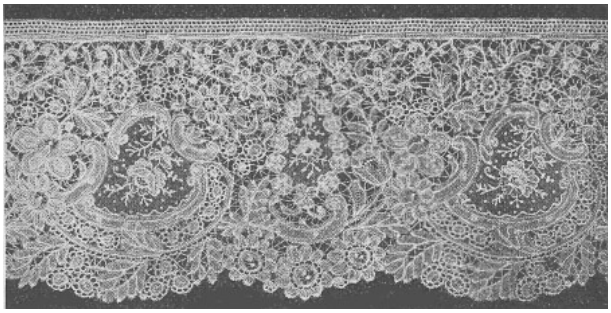


Fig. 8. Mechlin. The essential differences in types of bobbin laces are based on variations in the twisting and plaiting of the thread used for the mesh.

Machine-made Lace. Almost every description of lace is now made by machinery, and some is so well turned out that it is difficult at first sight to tell it from hand-made. The weakness is often in the edge—especially where indented—which is liable to ravel in washing. Machine lace never possesses the finish or rich, soft beauty of the hand-made, and its threads have a squeezed look. In net laces the mesh of the ground has a hard even appearance, instead of the soft, slightly irregular charm of hand work. In needlepoint imitations the buttonhole-stitch, which forms a large portion of the work, is not well reproduced, while the plait of bobbin lace can only be satisfactorily imitated at a high cost. Coarse laces are produced for furnishing purposes and curtain laces on bobbinet.

The Care of Lace. Old lace should be kept in a dry, warm atmosphere, and if laid away for a time should be taken out of the drawer or box and aired at frequent intervals, as it is liable, especially black lace, to a species of mould. Sometimes lace is handed on which has been cut or torn; unless the art of lace making be understood, it is worth taking the piece to an expert to be joined or mended.



Lace. Fig. 9. Duchesse lace. Strip of delicate real lace, showing a characteristic and beautiful floral pattern. (Courtesy of Haywards (Bond Street), Ltd.)

In the case of laces with torn hand-made net grounds, which are often worn into holes long before the heavier patterns show any signs of wear, the net should be repaired by needle or bobbin, according to the original workmanship, as a machine-made net backing would destroy a good deal of the value of the lace.

Hand-made lace should not be dry-cleaned, as the process is injurious to the delicate fabric. It should be firmly pinned to a linen-covered board with a sufficient number of pins to keep the lace flat, and dabbed gently till quite damp with a sponge. Then, pure Castile soap should be dissolved until it forms a good lather in warm water; the lace is dabbed with this till clean, the soap sponged off with clean water, and as much moisture as possible removed from the lace with a dry sponge. It must not be ironed, but left to dry on the board. If properly pinned it will not be pulled out of shape.

Very thick lace that cannot be sufficiently cleansed by dabbing may be placed in a saucepan in soapy lather which has been allowed to cool, and then brought to boiling point. The lace should be rinsed in clean water, and pinned out flat to dry. Black lace should be pinned in the same manner, but dabbed with vinegar and left to dry. Should a deeper old tint be desired for white lace, after it has been cleansed it may be laid in cold tea.

The sewing on of lace is an important part of its care. The cotton or silk used should match the lace and not the material. For lingerie laces, where a firm and yet delicate method of attachment is desirable, a close satin-stitch is often used, and is suitable for a straight or rounded edge. The lace should first be tacked to the material, and then run with small stitches along the base. This is practically a second tacking, which keeps the line of the lace straight for the closely covering satin-stitch. Without the precaution of this close running, the lace usually has a crooked appearance. After the completion of the satin-stitching, the raw edge of the material behind should be cut away close to the stitches.

For straight edges only, a hemstitched veining may

be used. Sufficient threads having been drawn for the veining, and the lower edge worked in the ordinary hemstitch way, the lace must be tacked to the upper edge of the veining. Between each ordinary hemstitch which connects a group of threads, one or two seam stitches should be put into the edge of the lace. The work is completed by cutting the raw edge at the back, so that only a tiny turning remains. This is overcast from the left, the edge being turned with the needle so that a perfectly neat finish is obtained.

For sewing on a lace with deeply indented edge, when it is wished to keep the points flat and to use the top of the lace for the outer edge of the trimming, as is generally done in lingerie, the extreme edge of the lace points may be firmly tacked to the material. Starting from the right hand on the right side of the garment, a small horizontal back-stitch is made in the material under the lace, and then a perpendicular back-stitch through the lace and material. These stitches are continued at right angles, the perpendicular stitch being worked from the second needle hole of the horizontal, till the lace is completely joined to the garment. On the wrong side cut away the material and overcast. Where shoulder ribbons are used they should be stitched on to the lace, and again on to the material, to save strain on the lace.

Lace Making. Whether the hand-made lace is made with a needle or with bobbins, certain French terms are used in describing the details. The pattern is known as the toile or gimp, the bars or links are called brides, the meshed groundwork is the réseau; the outlines to the edge of a pattern, made in strong thread or threads, are known as the cordonnet. The small loops are picots, and ornamental fillings are modes. Sometimes the réseau is a fine net to which the pattern is stitched down after being made separately. This lace is known as appliqué.

The materials required for needle-point laces, besides special lace needles made with rounded points, are lace thread, lace braids in suitable widths, obtainable in white, écru and black, and in various designs; also linen, net and muslin. The method of procedure is simple. The pattern is first drawn upon a piece of parchment, and the parchment is tacked to a piece of strong linen. Threads are laid on the leading lines drawn on the parchment, and these are stitched down here and there by threads passing through both linen and parchment. This forms a skeleton outline of the pattern and is closely covered by buttonhole-stitches in thread. Connecting meshes, links, or bars, are made to hold the pattern together with buttonhole stitches. A sharp knife is inserted between the parchment and the linen, and the original stitches, which were passed between the parchment and the linen, are cut. The loose threads are picked off and the lace is complete.

In making the laces known as point lace, lace braids are first tacked carefully on to the pattern, following the design exactly. Patterns are obtainable ready drawn upon the linen. These point lace patterns are all drawn with double parallel lines, between which the braid is tacked on with small running stitches. When the braid turns a curve it must be whipped on both edges and lightly drawn up to follow the form of the pattern exactly. Having tacked down the braid, the connecting bars must be cast. Secure the thread with a small buttonhole-stitch, pass to the opposite braid, and then return with a twisted thread to the place where the original small buttonhole-stitch was placed.

Other spaces formed by the braid may be filled with various needlepoint-stitches. There are about forty of these, and it is not within the scope of this article to give details of them, or for employing them in the making of modern reticella, Venetian, and renaissance laces. The simplest braid lace is Bruges. This is made by tacking Bruges lace braids of varying widths into the selected design to form the pattern and whipping them into position. The spaces between the braids are then carefully filled. Sometimes a picot bar braid is used, or, if preferred, the connecting bar threads can be plainly buttonholed with equally good effect. Having practised the handling of the braids and making the bars for this lace, it is worth while for the interested worker to purchase a book on needle-made laces.

Making a Pillow. The pattern in bobbin lace is made by twisting and plaiting the threads of linen, cotton, or silk. The design is selected first, and is drawn on paper or parchment to form the patterns. It is then pricked with holes by a pattern pricker. This pricked pattern is fastened to a pillow, and serves as a guide in the disposal of the pins used later to guide the threads.

Some workers use a circular-shaped pad attached to a board, which can be rested on a table and moved about easily. Other lace workers use a well-padded pillow, flattened at both ends so that it can be held between the knees. Whilst the lace is being made it is securely pinned down to the pillow, which is covered with a stout but soft piece of cotton for the lace to rest upon during the process of making. The threads from which the bobbins hang are fastened at the top of the pattern, so that the bobbins themselves hang down over the cushion towards the worker and rest above the lace that is being made.

Whatever form of pillow is chosen it must be firmly and evenly stuffed. It is first covered with canvas and then with green linen or sateen. Finally, a piece of white calico, larger than the design, is pinned securely over the pillow and the pattern is pinned to this. The pins are driven right into the pillow to secure the calico cover and the design in such a way that only the heads are visible. Most workers hem covers for their pillows of navy blue linen about 2 ft. square, washing the linen three or four times to be quite sure that all the free dye has been taken out.

In the centre a small circle is marked measuring about 1½ in. in diameter, and the circle is outlined all round by a running of thread. This is then buttonholed around, and finally the small circle of linen is cut out from the centre. Through this small hole the lace is worked so that the rest of the pillow and the lacework

is kept covered and clean.

Ready-made pillows are not very expensive, but the beginner can make her own quite easily. A piece of green linen or sateen measuring 18 in. by 20 in. is folded over, and its longer sides are joined by machine. This is turned inside out, and a half-inch hem is made at each end and a tape is run through each hem. One end is drawn up and tied securely. A circular piece of cardboard with a 6 in. diameter is placed at the end over the drawn-up portion. The pillow is filled up with sawdust or hair, and then a second circular piece of cardboard, exactly the same size as the first piece, is placed over it before the open end is drawn up.

Marking the Design. The design is drawn in ink on some strong, smooth blue paper. If the beginner finds it easier, she can have the design pricked on the paper, and even have a dot for every position where a pin must be placed later in manipulating the threads. The pins used by lace makers are smoother and more slender than ordinary pins; but the beginner can use large ordinary pins at first, and will need 4 or 6 dozen. Lace pins must be kept clean and free from rust, and a plentiful supply facilitates the work. Some workers dip the heads of the pins into melted wax, so that a little globule forms a bead at the head of each pin, and prevents it from slipping through the lace. It is a good plan to have a small pin-cushion with a tab, and to pin it securely to the lace pillow in a position where it can conveniently be reached by the right hand when working.



Fig. 10. Full bobbin.

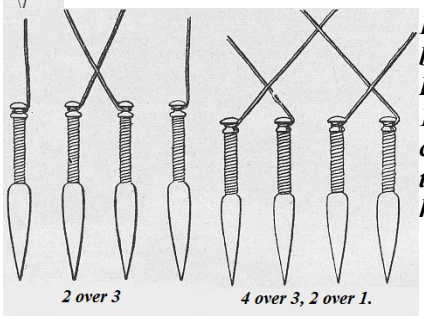


Fig. 11. *Fig. 12.*

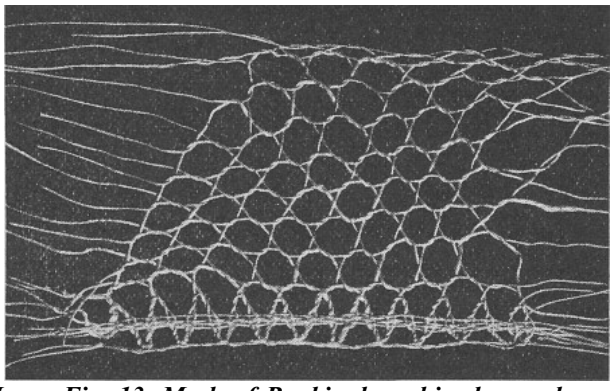
Lace. Figs. 11 and 12. Showing crossings of the threads to make the half-stitch.

Pricker, bobbins, and bobbin-winder have next to be considered. A pricker can be bought at any art needlework shop. A homemade pricker can be made by taking the wooden portion of an ordinary penholder, melting a drop of sealing-wax, and placing it on the end, and then embedding an ordinary strong but fine sewing needle in the wax while it is still warm and soft. The wax is gently pressed round the eye-end of the needle, and when it cools and sets it holds it firmly in place.

Bobbins of many shapes are available in wood or bone. The number needed depends upon the nature of the design. A beginner would only need about 2 dozen, but elaborate designs may require well over 1,000 bobbins. Each bobbin is like a little spool with a more or less elaborate handle. If the bobbins have any roughness or unevenness on their surfaces, it is advisable to rub them over gently with fine sandpaper, as the threads used in lace-making are so fine and so easily broken. When the bobbins get dirty, they can be worked in a warm, soapy lather, but they must not be used to hold thread again until thoroughly dry.

A bobbin winder is not necessary for a beginner, but it saves time, especially if it has a skein-holder attached. It is very easy to soil the thread, so all handling must be avoided, and it is a good plan to wear white cotton gloves when winding the bobbins. Many workers wear also a white apron and over-sleeves to protect the lace.

Making Bobbin Lace. Amongst the general rules for making bobbin lace, it is important to work in a good light, preferably with the light falling from the left. Directly the eyes feel tired, the work should cease for the time being. It is not necessary to look too closely at the bobbins, but the threads should be watched, as mistakes are then quickly noticed and put right. The bobbins must be kept closely wound and are picked up lightly by the finger-tips, care being taken not to get them accidentally knocked out of place. Both hands must be used.



Lace. Fig. 13. Mesh of Buckinghamshire lace enlarged to show details.

British-made linen thread is the best for lace-making purposes, but mercerized cotton, silk, tinsel, and plain crochet threads are also employed. If the thread becomes entangled, it must not be handled, but the pricker must be used to free the threads. Any thread not in use should be rolled up in blue paper to preserve its colour, and put in an airtight tin until it is wanted.

If a thread breaks it must be dealt with carefully, and a knot must never be left visible in the lace itself. If the warp thread breaks some distance from the actual plaiting, it may be possible to knot the broken ends and finish the particular section of the lace before the knot is reached. If the break occurs in a traveller thread, it may be brought to the edge and there exchanged by a twist with a stationary bobbin. In this way the knot will not appear in the lace. If the broken end is very short, wind the broken end extending from the bobbin round a pin and tie it. Stick the pin into the pillow near the other broken end of thread. Replace the bobbin and go on weaving. Then cut off the broken end close.

The pattern in bobbin lace is often outlined with stronger thread than that used for the mesh. The varia-

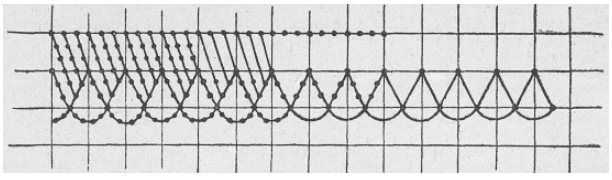
tions in the twisting and plaiting of the mesh constitute an essential difference in the various kinds of lace.

The bobbins should all be wound the same way, i.e. away from the person winding if she is right-handed. When the body of the bobbin is moderately full, cut the thread, wind it twice round the neck, pull the end under the thread when it runs from body to neck, and pull taut (Fig. 10). When all the bobbins are wound and hung on to pins ready to start the pattern, it is advisable to practise lengthening and shortening the threads. To lengthen, hold the bobbin horizontally and revolve it between finger and thumb until it is the length required. To shorten, hold the bobbin in the left hand, insert the right forefinger under the thread which runs from body to neck, and pull upward while the left hand revolves the bobbin until it is short enough.

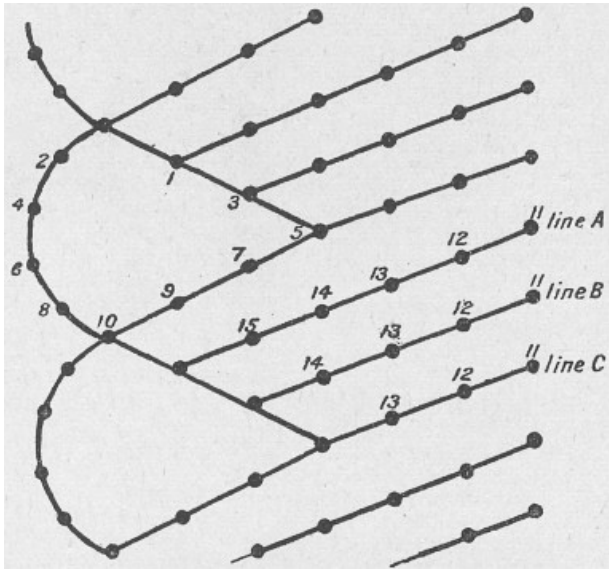
If the thread gets loose from the neck and the bobbin begins to unwind after the work is started, it is only necessary to wind the bobbin to the length required and finish by winding the thread twice round the neck of the bobbin and pulling taut. There are three elemental stitches used in all bobbin lace. They are known as half stitch, double stitch, and cloth stitch. To make any stitch 4 bobbins are required, and to learn the stitches it is a good plan to knot the threads of 4 bobbins together, fix the knot to a pincushion, and practise the stitches a few times before starting a pattern. Except for outlining with a gimp thread, bobbins are used in pairs.

To make a half stitch, place the two pairs of bobbins to be used in the centre of the pillow hanging from a pin and number them from the left. Cross 2 over 3, cross 4 over 3, cross 2 over 1. The first step should be done singly and the second and third steps simultaneously, using the right hand to lift 4 over 3 and the left hand to lift 2 over 1. Figs. 11 and 12 show the working. Double stitch is half stitch done twice without interruption, while cloth stitch consists of crossing 2 over 3, 4 over 3, 2 over 1, and 2 over 3. Whenever a pin is to be inserted it should be placed between bobbins 2 and 3, i.e. between the pairs.

If the directions say close in, it is intended that a similar stitch should be made with the same two pairs before proceeding. Twist means cross the right-hand bobbin over the left-hand bobbin of any pair mentioned. It is done once or twice or more times according to the pattern. To fix the two bobbins on the pillow, knot them in groups, say 8 bobbins together or less if preferred, and tie the ends of each group to a pin stuck into the pattern about ½ in. higher up than the work is to be started. The bobbins are counted in pairs, counting from the left.



Lace.Fig. 14 (above). Diagram showing four consecutive stages in the making of Buckinghamshire lace.
Fig. 15(below).Arrangement of pins for making this lace.



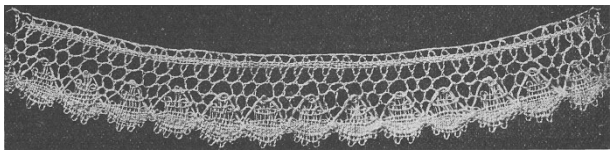
Buckinghamshire Lace. Instructions are given how to make a simple Bucks lace pattern. The two distinctive points about Bucks lace are the mesh or réseau and the gimp, a thicker thread which outlines portions of the pattern. Fig. 13 shows the mesh on an enlarged scale. For the following pattern 26 bobbins are required, two of which should be wound with gimp thread and the remainder with a medium flax lace thread. It is a good plan to have the gimp wound on bobbins which are markedly different from the rest. This pricking can also be worked out on the squared ¼ in. cardboard, and Fig. 14 shows the method in four stages. Tie the bobbins to pins in groups of 6 or 8, and begin the pattern a little further down so as to get clear of the knotted threads. Before beginning arrange that one gimp bobbin is the 3rd from the left, the other the llth from the right.

Start with the shell edge, which is worked in cloth stitch. Count the bobbins from the left. Use the diagram in Fig. 15, and see also Fig. 16. Make a stitch (cloth) with the 2nd and 3rd pairs, the 3rd and 4th, the 4th and 5th; put a pin in hole 1 and close in. Make a stitch with the 3rd and 4th, 2nd and 3rd, and pass the gimp through the 2nd pair by crossing it over one and under the other bobbin of this pair. Make a stitch with the 1st and 2nd pairs, twist the 1st pair 3 times; put a pin in hole 2 and close in. Pass the gimp back through the 2nd pair. Make a stitch with the 2nd and 3rd pairs, with the 3rd and 4th, the 4th and 5th, the 5th and 6th; put a pin in hole 3 and close in.

Make a stitch with the 4th and 5th pairs, the 3rd and 4th, the 2nd and 3rd. Pass the gimp through the 2nd pair. Make a stitch with the 1st and 2nd pairs, twist the 1st pair 3 times; put a pin in hole 4 and close in. Pass the gimp through the 2nd pair. Make a stitch with the 2nd and 3rd pairs, 3rd and 4th, 4th and 5th, 5th and 6th, 6th and 7th; put a pin in hole 5 and close in. Pass the other gimp through the 7th pair and then twist the 7th pair twice. Make a stitch with the 5th and 6th pairs, the 4th and 5th, the 3rd and 4th, the 2nd and 3rd. Pass the gimp through the 2nd pair. Make a stitch

with the 1st and 2nd pairs, twist the 1st pair 3 times; put a pin in hole 6 and close in. Pass the gimp through the 2nd pair. Make a stitch with the 2nd and 3rd pairs, the 3rd and 4th, the 4th and 5th, and 5th and 6th; put a pin in hole 7 and close in. Pass the right-hand gimp through the 6th pair and twist the 6th pair twice.

Make a stitch with the 4th and 5th pairs, the 3rd and 4th pairs, the 2nd and 3rd pairs. Pass the gimp through the 2nd pair. Make a stitch with the 1st and 2nd pairs, twist the 1st pair 3 times; put a pin in hole 8 and close in. Pass the gimp through the 2nd pair. Make a stitch with the 2nd and 3rd pairs, 3rd and 4th, 4th and 5th; put a pin in hole 9 and close in. Pass the gimp through the 5th pair and twist the 5th pair twice. Make a stitch with the 3rd and 4th pairs, the 2nd and 3rd. Pass the gimp through the 2nd pair. Make a stitch with the 1st and 2nd pairs, twist the 1st pair 3 times; put a pin in hole 10 and close in. The two gimps now change places. Pass the left-hand gimp through the 3rd and 4th pairs, cross the right-hand gimp over it and pass it in turn through the 4th, 3rd, and 2nd pairs. This finishes the shell.

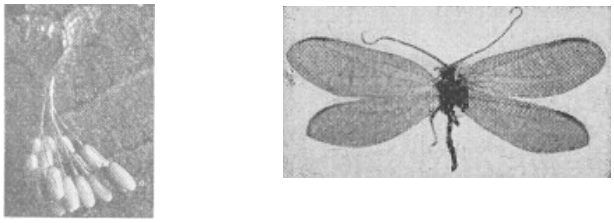


Lace. Fig. 16. Strip of narrow Bucks lace with shell edge, made by arrangement of pins shown in Fig. 15 above.

The réseau has next to be worked. The four pairs of bobbins and one gimp on the left hand can be pinned quite aside. Proceed with line A, and count the pairs of bobbins from the right. Make a cloth stitch with the 3rd and 4th pairs, with the 2nd and 3rd; twist the 2nd pair 3 times and put a pin in hole 11. Make a half stitch with the 1st and 2nd pairs and twist them each twice. Make a cloth stitch with the 2nd and 3rd pairs, with the 3rd and 4th pairs; twist the 4th pair 3 times and put a pin in hole 12 between the 3rd and 4th pairs. The selvedge is always worked in this way.

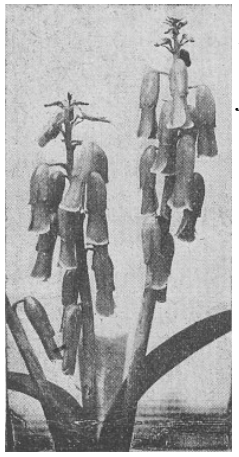
Now begins the réseau proper. The enlarged detail of this is clearly shown in Fig. 13. This characteristic mesh is used in all Bucks lace for few or many holes, according to the pattern. The following stitch is used for it. Make a half stitch and twist once each of the pairs with which the half stitch has been made. If a pin is put in, it should not be closed in. Make a Bucks stitch with the 4th and 5th pairs, and with the 5th and 6th pairs; put a pin in hole 13 between the 5th and 6th pairs. Make a Bucks stitch with the 6th and 7th pairs; put a pin in hole 14. Make a Bucks stitch with the 7th and 8th pairs; put a pin in hole 15. Pass the gimp through the 8th pair and twist the 8th pair twice. Proceed in the same way with line B as far as putting a pin in hole 14, then pass the gimp through the 7th pair and twist the 7th pair twice. In line C (Fig. 15) proceed as before as far as putting a pin in hole 13, then pass the gimp through the 6th pair and finally twist the 6th pair twice.

LACEWING FLY. One of the few insects which may be called a friend by the gardener is the lacewing fly, whose larvae devour the aphides. The adult insects have slender, pale-green bodies, about 1½ in. long. pair twice.



Lacewing or Golden-eyed Fly. One of the few insects which are helpful to the gardener. Left, eggs of the fly.

They deposit their eggs upon hair-like filaments on leaves and shoots. About a week after tiny larvae hatch out, and these immediately begin to devour the aphides, slaughtering great numbers in a very short time. The larvae measure about ⅜ in., and may be identified by their dirty white bodies, spotted with brown or orange. The parent fly, by reason of its prominent golden eyes, is sometimes called the golden-eyed fly. *See* Insect.



Lachenalia or Cape Cowslip, a handsome spring-flowering bulb for the greenhouse.

LACHENALIA. This showy spring-flowering greenhouse plant is popularly called the Cape Cowslip. The narrow tube-shaped flowers are chiefly of yellow, orange, or orange-red colouring. Lachenalias look well in hanging baskets, or may be grown in pots. The bulbs should be potted in August-September in a compost of loam, with some decayed manure and sand added. After having been kept in a cold frame for six or seven weeks they will be well rooted, and should then be placed in the greenhouse. A temperature of 50 to 55 degrees will be found to be suitable. When the leaves begin to turn yellow in spring, watering should be discontinued gradually, and finally, as the leaves fall, the soil must be kept dry until August, when the bulbs may be taken out and repotted. The chief kinds of lachenalias are Nelsoni, pendula and tricolor, but many named varieties of improved colouring are now obtainable. Pron. Lac-e-nā'li-a.

LACKEY MOTH. Much damage is done to fruit trees by the lackey moth. Its caterpillars feed on the foliage of many kinds of trees and shrubs, including the apple, cherry, plum, and pear among fruits, and the oak, hawthorn, willow, alder, elm, and rose among trees and shrubs.

In Leaflet 37, issued by the Ministry of Agriculture and Fisheries, the following measures are suggested

for ridding trees of this caterpillar pest: Spraying is effective if carried out early enough, and also at any time if there are not many caterpillars on the tree. When, however, the whole tree is enveloped in webbing it is impossible to get enough poison on to the leaves to do any good. The best time to spray is within three weeks after the dropping of the petals from the flowers. Lead arsenate (1 lb. paste to 20 gal. water) is the best insecticide to use, and the wash should be applied through a fine nozzle, giving a light dressing to every leaf on the fruit tree. In gardens with only a few trees affected the pest can be destroyed by hand. *See* Fruit; Insecticide; Spraying; Syringe.



Lackey Moth, an insect pest which attacks fruit trees. Left and above, caterpillar; below, right, moth. (By permission of the Ministry o] Agriculture and Fisheries and H.M. Stationery Office)

LACQUER: How to Apply. The purpose of lacquering is to protect the surface of the object from the action of the air, and so prevent it from tarnishing. Door knobs, handles, fenders, and other articles can be lacquered, thus obviating the need for constant polishing. They should last at least six months without requiring any further attention.

The materials required are several bottles of lacquer of different colours; good quality soft camel-hair brushes, one or two clean glass bottles with cork stoppers, for the storage of the brushes, a quantity of clean sawdust, preferably boxwood, and some means of heating the objects to be lacquered. The operation must be carried out in a warm room absolutely free from draughts, as they cause the lacquer to bloom, that is, to dry with a milky, bluish appearance.

Suppose, for example, it is intended to lacquer a polished brass or copper object such as a door knocker. The primary stages of polishing are dealt with in the article on polishing (q.v.), or the surface may be finished with a matt effect by dipping in dilute nitric, sulphuric, or hydrochloric acid. The utmost care must be taken when using these chemicals, as all of them are poisonous. Some clean tissue paper will be found useful for handling the lacquered article. The next stage is to clean the article thoroughly. This may be done by boiling it in clean water, allowing the water to drain off, and then drying it by burying it in a tin of hot sawdust which has previously been heated by baking it in the oven. After the object has been left in the sawdust for a few minutes it can be removed and brushed over with a clean, dry brush to remove any traces of sawdust. On no account must the article be touched with the bare hands after it has been cleansed, but should always be handled by grasping it with a piece of tissue paper, or some other material free from grease.

The lacquer, which is composed of shellac, a colouring material, and methylated spirit, or some similar solvent, is best obtained ready made from the makers, or from any high-class colour shop. One type known as hot lacquer, has to be worked hot; others are known as cold lacquer, which is brushed on like ordinary varnish, and generally sold under proprietary names. The cold lacquers are very simple and easy to use, and very handy for lacquering bath taps and fixtures which have to stand hard wear. For all ordinary purposes the hot lacquer should be employed. All types of lacquers can be obtained in a variety of colours, but, generally speaking, the colourless or crystal lacquer is quite invisible when applied to metal. A pale gold scarcely permits the yellow shade to be noticed. Deep gold imparts a notable increase in the depth of the colour, while the coloured lacquers, green, blue, or red, colour the metal more or less. They are all applied in the same way.

Hot lacquering is performed by first warming the object, e.g. over a flame from a gas burner, or similar heating medium, taking care to keep the object more to the side of the flame so that it does not get soiled from the products of combustion. The exact temperature can only be determined by experience, but a few tests on various articles will show the effects obtained by variation in temperature. Roughly speaking, if the work is too cold, the lacquer dries up lustreless with a dead appearance. If too hot, the lacquer sizzles when applied to the work, and dries off with a streaky, granular effect.

The happy medium is that temperature at which the lacquer can be brushed on comfortably, and will dry quickly with a very bright, lustrous surface. Usually this result is accomplished by using a large brush, dipping it into a clean glass container with some of the lacquer in it. A sufficient quantity, but not an excess, should be held by the brush, as the lacquer evaporates very quickly. Wipe some of the lacquer from the brush on the edge of the glass vessel, but leave the brush so charged that the lacquer will flow freely from it, but without any tendency to drip off the brush.

Apply one coat only, on every part of the work, and never brush the same part twice. In the case of a long, slender object, rotate it with the left hand while brushing on the lacquer with the right. In other cases, a long, firm, sweeping application of the brush is employed. Then bring the work fairly near the heating

stove, and turn and twist it about for a few minutes until it is hard and dry. If any quantity of lacquering is to be done, it will be best to make up a lacquering oven from an old biscuit tin. Fit a door to the tin, and fit up a pair of wire hooks, or a little tray, on which to rest the lacquered objects. The oven should be placed upon the heating stove and warmed up.

Should the work be spoilt for any reason, the best remedy is to clean off lacquer with methylated spirit, repolish and relacquer.

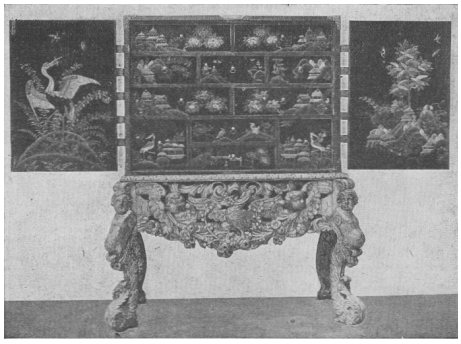
LACQUER WORK FOR THE AMATEUR

Antique and Modern Forms of this Artistic Handicraft

Those interested in similar occupations should turn to the articles Gesso Work; Lampshade; Leather Work; Papier-Mâché; Repoussé Work; Stencilling, etc. See further Bureau; Corner Cupboard; Grandfather Clock; Screen; and other pieces of furniture on which lacquer is sometimes used; also Chinese Style; Chippendale Style; Queen Anne Style.

Lacquer work was introduced into England in the latter half of the 17th century, and Chinese lacquered panels were imported and made up into pieces. In Queen Anne's reign English lacquer work became fashionable and was later popularized by Chippendale. The cabinet in Fig. 1 shows an exquisite example of 17th century workmanship.

Much of the English lacquer was done on papier-mâché trays. The tray illustrated in Fig. 2 is a good specimen of modern lacquer copied from an old piece of English lacquer. The following directions are given for this work. Rub the tray or wood carefully with fine sandpaper, and coat it over with filling, which is paste made of whitening mixed with water to the consistency of thin cream. Add a little plaster of Paris, and a little glue, powdered, if possible. If ordinary glue is used it must be carefully mixed in when warm, and unless the filling is used at once, the mixture must be kept warm. Avoid using thick filling, as this makes an uneven surface. When dry, rub it down again with sandpaper.



Lacquer Work. Fig. 1. Cabinet in Chinese style, with brass mounts on silvered stand; English make, c. 1660-85. (By permission of the Director, Victoria & Albert Museum. S. Kensington)

A filling can be purchased together with a set of Chinese lacquer colours and other requisites in an outfit. They are subject to the Petroleum Act and cannot be sent through the post. Spirit lacquers require careful handling as they are inflammable, and cellulose lacquers, though yielding a fine finish, possess a pungent odour to which the worker requires to accustom himself.

When the work is filled and rubbed down, a design has to be chosen. Designs may be bought from some firm which specializes in this kind of work. Most oriental designs are built up from several motifs, and can be adapted from illustrations or other Chinese pieces. A willow pattern plate or dish makes a good design for adapting to a small piece of work.

The difference between English lacquer and the Chinese is that the design is usually more crowded in the English. Small borders of flowers, scrolls, etc., tend to alter the character. The scroll shown on the tray is typical of English lacquer.



Fig. 2. Oval papier-mâché tray, a specimen of modern lacquer copied from an old English piece.

The next step is to colour the background. For this, dull black lacquer should be employed. Put on one coat with a flat squirrel hair brush and allow it to dry. Then apply a second coat. If it is at all rough, sandpaper it carefully before applying the second coat. Two coats of black are usually sufficient, but should the groundwork look poor, apply a third coat. Draw, or trace from a copy, the main objects of the design on a piece of tracing paper the size of the article, then turn it over and rub the back with whitening. Lay this carefully on the article and go over the design with a pencil, which will apply a clear white tracing to the black surface. The raising paste is next applied. Make all surfaces where it is intended to apply raising paste rough by scratching with a penknife. A paste can be used as directed for the filling, except that it must be much stiffer, or gesso powder may be employed. Choose a hog's hair brush with long hair for this, and apply it by working round the inside of the outline, twisting the brush towards the worker. As it spreads a little, keep inside the outline. Very little raising is used in English lacquer. For the tray the only part raised was the roof, the rocks at the back, the bridge and the figures very slightly. Allow the raising paste to become quite dry, but do not put it near a fire or it will crack. When dry, rub, it carefully with sandpaper if at all uneven or rough.

Next gild the raised portions and all main parts of the design, omitting any fine detail. For this gilding first use the special medium obtainable. Paint it over, and when almost dry dust it over with rather heavy bright gold powder, using a chamois leather. Allow it to dry for at least a day. Then wash with soap and water, and dry it carefully, using a soft cloth. If the fine detail cannot be put in freehand, trace, then paint it in with chrome yellow to which a little medium has been added. Dust it over with gold. When it is dry wash it, and put in any foreground, touch it up where necessary and shade it a little with black lining ink and water colour. When dry give it two coats of brown varnish, rubbing down between each coat with poudre de silice. After the second coat of varnish is thoroughly dry, give it a good rub with chamois leather. In English lacquer the floral borders are often painted in colours.

Prepare the wood very carefully when lacquering an old piece of furniture. Wash it well with strong soda water, then rub it down or have it scraped, to remove any roughness. Apply the lacquer very evenly. Quick drying spirit lacquers are not easy to use. A modern outfit sold contains a special solvent for thinning these, as the best results are obtainable by using two or three thin coats rather than one thick one. Amateurs should always try black first, as it is much easier to remedy any mistakes, and usually works more evenly. Pale coloured lacquers are the most difficult for them to use as they need careful handling, and cannot be touched up to any extent.

After the surface is ready, transfer the design as explained, then study it well and decide which portions are to be raised. Unless it is a large piece of work, such as a cabinet, do not raise it too much as it looks clumsy. The small table and finger plates shown in Figs. 3 and 4 respectively had the rocks, temple, and roofs of the houses raised; the lamp-stand in Fig. 5 had only the foreground and a bird.

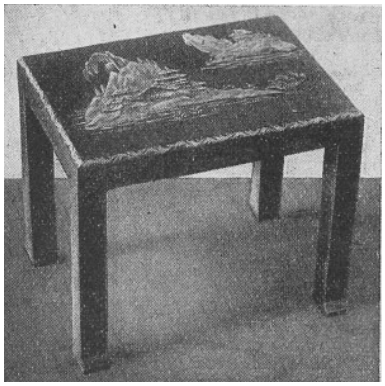


Fig. 3. Small lacquer table, a good modern example in the Chinese style.

When dry sand-paper it well and dust it carefully before commencing to work in the fore-ground. For this the special medium is required. Paint over all the foreground, and when tacky dust it over with coloured bronzes, using gold, red, green, and a little silver. These can be shaded in with the chamois leather. When dry dust off any superfluous powder, and gild all the main objects in the same way. Use fine dull gold for this. When dry wash and dry it. When filling in the detail use a very fine sable brush, and make the strokes as fine as possible. Only do a little piece at a time and dust it over with gold. The medium dries quickly and will not hold the powder if allowed to become too dry.

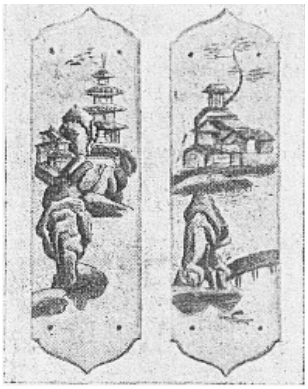
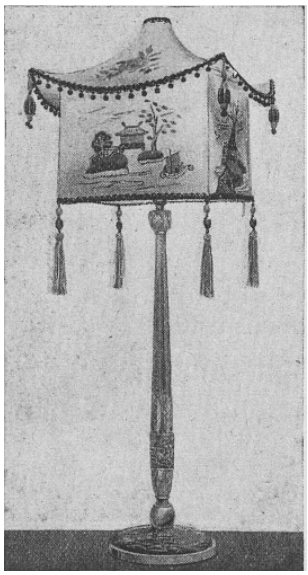


Fig. 4. Finger plates in raised Chinese lacquer.

When the detail is finished and dry, wash it well and dry it carefully. The line work must be done next. Mix the special ink with ivory-black water-colour, and put in the fine lines. Should the gold lines be too thick, this can be remedied by painting a black line at the side.



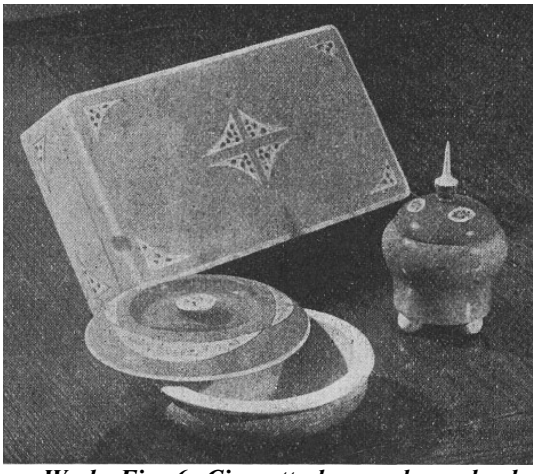
Lacquer Work. Fig. 5. Chinese lacquer lamp stand with silk lampshade.

The work may be shaded by using a little burnt sienna and here and there a touch of red. Poster colours may be used. The advantage of using these is that mistakes can be wiped off with a wet rag and the parts in question put in again. Should the work be too bright when finished, dip a damp rag in a little poudre de silice and rub it over the surface, working with the grain of the wood. A final coat of clear varnish may be applied over the whole work where pale ground colours are used. Otherwise brown varnish is used as described for finishing the tray (Fig. 2).

For a silk lampshade, such as that illustrated in Fig. 5, no raising paste must be used, as the effect must be obtained by shading. The shade is painted after it has been made up. If the work is to be transparent, use oil colours and stencilling medium. Broad work is the most effective, and the use of gold should be avoided as much as possible. A vellum lampshade to suit this style of lamp may be coloured with waterproof inks.

Modern Forms of the Work. There are other kinds of lacquer work of interest to the amateur. Lacquering on leather will be described under Leather Work, and lacquer used in conjunction with raised and modelled gesso and barbola paste has been dealt with in the article on Gesso Work. Modern methods of decorating over lacquer grounds include Worcester painting, so called from the designs chosen, which resemble those on Worcester China, and Marbling. Examples of the first are shown in Fig. 6, while the candlestick in Fig. 7 has been decorated by means of the second. Stencilling is also employed, being carried out in liquid oil colours over the groundwork of lacquer. When it is desired to mix lacquer colours for

the groundwork this cannot be done from the bottles, and the mixing is done in a saucer convenient to work from while painting the article, as shown in Fig. 8.



Lacquer Work. Fig. 6. Cigarette box and powder bowls showing Worcester China effect with stippled coloured background and white lacquer.

Worcester painting is particularly suitable for the decoration of dressing-table sets, cigarette-boxes, and for pieces of pottery. Artistic work is achieved with this type of decoration when applied to a pottery vase suitable for a lamp and using the same designs for the vellum shade. On Worcester and Chelsea china tea services, etc., designs are often set in shaped panels, and birds, small flower sprays and Chinese motifs can be copied. Maroon, canary-yellow and apple-green are all correct colours for the finished groundwork, and show up the panels most effectively. The first stage is to coat the article over with the filler, as already de-scribed, sandpapered to a smooth surface. Then a coat of white brush-lacquer colour is painted evenly over the surface, using a squirrel hair brush. This must be allowed to dry and a second coat applied. The work must now be left for some hours, preferably overnight, to allow the lacquer to harden before proceeding further. The inside of a box or other article should be lacquered without the coating of filler. The surface must first be sandpapered.

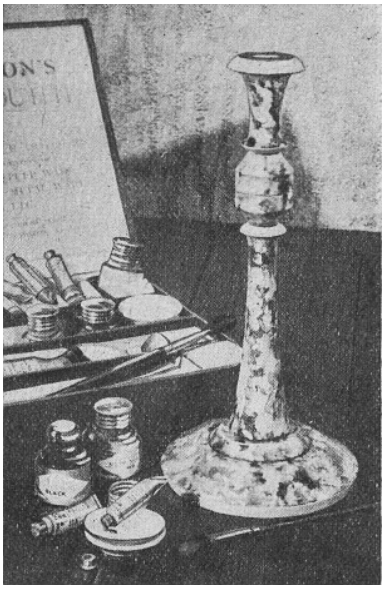


Fig. 7. Candlestick decorated by marbling process in water colour or lacquer.

The next stage is to wipe the article over with a damp cloth and then to cover it with the desired shade, yellow for instance, using chrome lemon poster colour, and to stipple this over quite firmly afterwards with a dry squirrel hair brush. The method of holding the brush is shown in Fig. 8.

The coat of stippled poster colour must be allowed to dry before the third and most interesting stage of the work is begun. This is illustrated in Fig. 9, which shows the method of wiping out the panels for the Worcester designs. It is better to use templates for this rather than trust to the unaided hand.

Templates may be cut out of oiled manilla paper, or purchased in packets of a dozen assorted shapes for a few pence, and their usage will ensure the clean shape of the circle, oval or triangle. Through the template the small panel spaces are wiped out with a slightly wetted rag *(see* Fig, 9), removing the yellow poster colour and leaving the originally painted white lacquer ground-work showing.

The rim and base of the article should be treated in the same way. This must be done cleanly, and not a trace of the yellow colour should remain.

After the panels have been thus prepared the designs are drawn and painted. More elaborate designs can be traced by means of tracing paper and a carbon. For this work, however, embroidery transfers can be used of small floral patterns. Poster colours are used to tint these, and their simple delicate nature is shown in the three attractive pieces in Fig. 6. The powder bowl on the left has an apple green stippled ground. The interior handle and rim are of the white lacquer. Crescent-shaped templates were used through which to wipe out the panels on the lid. The design of wild roses is painted in pinks and greens and the panels are outlined with gold. Gold may also be used for the interior of a box or bowl. It must be used over the lacquered groundwork. When completed and quite dry the whole article is varnished with clear white varnish.

Marbling is even a simpler method of decorating a lacquer foundation. This consists in wiping off the poster colour with a damp cloth in a zigzag fashion to imitate graining or the many varied markings of marble. The candlestick which is shown in Fig. 7 has been decorated in malachite green over a cream lacquer groundwork. White or cream lacquer lends itself as admirable for foundations for this work, as for Worcester painting, but other lacquer colours can be used, and except black are suitable for marbling. Blue poster colour cannot be used over red lacquer as it has a tendency to blacken. Designs can be introduced into this marbled work by means of wiping a panel space clean through a template to show the plain lacquer groundwork. Very simple landscape or flower designs of the type used in modern marquetry work look well introduced into articles with slightly marbled surfaces.

Lacquer Work on Metal. Examples of a kind of lacquer work which appeals to many people are shown in Fig. 10. For this work four lacquer colours are prepared, red, blue, green and yellow, other shades being obtained by mixture of these. In some cases, as, for example, in the ship designs shown, the colours are used to enhance the pattern already modelled in the metal. In others, as in the brass cigarette box, which is

being painted in Fig. 11, the design for the most part is traced on to the metal. Having cleaned the box with methylated spirit, the selected design is transferred by means of a carbon paper. To prevent the lines being rubbed off they are scratched over with a steel knitting needle. Excellent results can be obtained by the amateur worker skilled in repoussé work, who is able to prepare his own designs in slight relief on pewter, brass or copper, and subsequently to colour them by means of these lacquers.

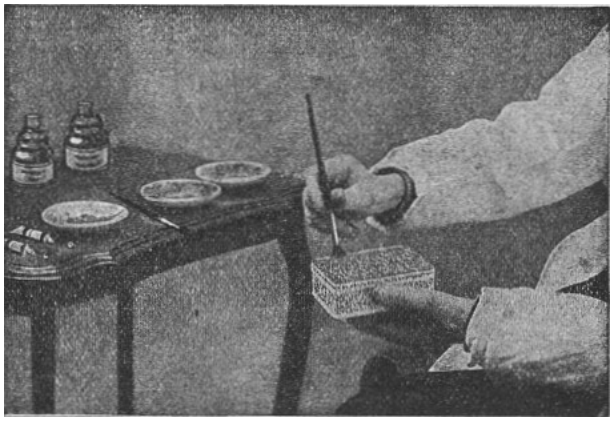
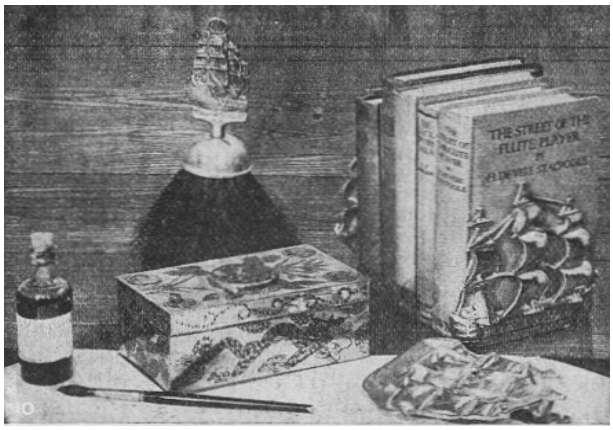


Fig. 8. Method of holding dry brush for stippling background.



Fig 9. Use of a template when wiping out the panels in Worcester China designs.(Courtesy of Winsor & Newton. Ltd.)



Lacquer Work. Fig. 10. Examples of coloured lacquer work on metal.

Bronze powders can be utilized in this work and Japan black lacquer. Camel hair brushes are employed for broader effects and fine sable for details. Yellow varnish is used to coat the whole piece when finished and thus render it untarnishable.

In conclusion it may be noted that brushes used for lacquer colours should be washed out in methylated spirit immediately after they are finished with each time. After use with oil colours for stencilling, if this is employed, brushes are cleansed with turpentine, and poster colours are washed off with water.

Bottles must be kept corked when not in use. Best results are obtainable if the work is allowed to dry thoroughly between each process. A coat of varnish should always be given to the finished article. Varnish should be applied evenly with a soft brush and the work set aside to dry where no dust is likely to settle on it. Lacquer colours always require an absolutely smooth surface. Where raising paste is used the opposite rule obtains. The particular portion of surface to be raised has to be roughened to make the paste adhere firmly to the work.



Fig. 11. Brass cigarette box in process of decoration; the design has been transferred and the coloured lacquer is being applied by means of a camel hair paint brush.

LACRYMA CHRISTI. A famous Italian wine from the vineyards situated on the slopes of Vesuvius is Lacryma Christi. It is a very attractive wine when drunk on its native soil, but comparatively little is imported into Great Britain. An exceedingly luscious wine of refreshing flavour, it is ordinarily of a rich red colour, although white and sparkling varieties are produced. The white variety is noted for its piquant flavour.

LACTIC ACID. By the action of the lactic acid bacillus on milk sugar lactic acid is obtained as a colourless, syrupy, sour liquid. It is one of the waste products of muscular contraction and has much to do with inducing muscular fatigue.

Lactic acid is found in the stomach in the earlier stages of digestion, when it is produced, by the action of bacteria on the carbohydrate foods. Metchnikoff thought that the presence of lactic acid bacilli in large numbers in the intestine prevents the growth of other bacteria and thereby prevents auto-intoxication, or

poisoning from the substances manufactured by such bacteria in the bowel. For the purposes of his treatment a large number of preparations containing lactic acid bacilli are sold for the artificial souring of milk, and milk soured in this way can be had from reliable dairies.

Calcium lactate, dose 10 to 30 grains, is used to increase the lime content of the blood, in restraining bleeding, in urticaria, chilblains, and for other purposes. The syrup of calcium lactophosphate, dose ½ to 1 dram, is a good tonic.

LACTOMETER. The specific gravity of milk may be measured by an instrument known as a lactometer, which is floated in the milk, and the figure marked on the stem of the instrument corresponding to the upper surface of the milk is then read off and represents the specific gravity. In good milk this should be 1·028 to 1·034.

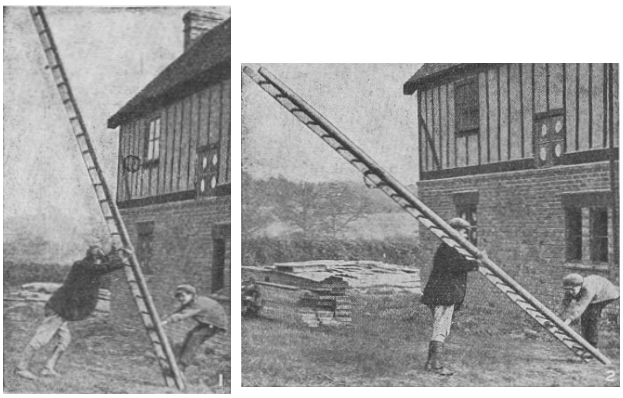
The greater the amount of cream the lower the specific gravity; but the increase in the figure which results from skimming off a portion of the cream can be lowered by the addition of water. By itself, therefore, the lactometer is a fallacious guide to the quality of milk, and other tests are therefore necessary. *See* Milk.

LADDER: How to Use. Extending ladders, in two or more sections, are very convenient in the home, being light in weight and sufficiently rigid for most household work. These are placed against the wall and extended by pulling upon a rope or by pushing up the extending portion. Iron fittings, varying in type with the different makes, are provided to hold the two parts firmly in contact and prevent the upper part of the ladder from sliding down until released.

When a ladder longer than 10 or 12 rungs is to be raised or lowered, it calls for two or more persons' assistance. To raise the ladder it should be placed on the ground, with the bottom a few feet out from the wall, in the position it will occupy when the ladder is raised. One person places one foot on the bottom rung, grasps the third or fourth rung above it and commences to pull, while the other person lifts the opposite end as high as possible.

The ladder is held with the arms extended above the head, by grasping the rungs and advancing hand over hand, thereby gradually raising the ladder higher and higher. The other person stands on the bottom rung and holds on to the fourth or fifth rung, leaning backward as far as he can, as shown in Fig. 1. This procedure is continued until the ladder is in a perpendicular position; when both persons should stand on the ground, grasping the sides of the ladder, and very cautiously allow it to fall over in the required position on the wall of the house, or wherever it is being placed. For a very long ladder three or four persons may be needed to elevate it.

As a precaution, the amateur may attach a rope to the ladder, leading it through an upper window and stationing someone at the end of the rope to haul on it when the others are lifting the ladder, and to hold on tight when the others pause. Having raised the ladder, it should be securely lashed to some part of the building, to prevent it from swaying or rocking. The angle a ladder makes to the house is important, and it is better to have it more upright than otherwise; the more vertical a ladder is the less strain is on it, and the less it will sway while anyone is working upon it.



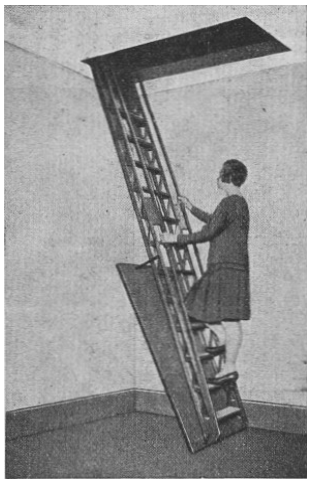
Ladder. Fig. 1. Correct positions when raising a ladder. Fig. 2. Method of lowering a ladder so that one man acts as a counterbalance to the weight borne by the man who holds it up.

Lowering a Ladder. To lower the ladder, the sequence of operations is to a large extend reversed. The lashings are removed, and if it is proposed to use the check rope from the upper window, this should be attached before the lashings are cast off. The person at the upper window with the check rope should constantly watch, or be advised of the action of those below, so that all concerned may work in unison. The person on the check rope should take the weight chiefly when the persons lowering the ladder are moving the hands from one rung to another.

The usual procedure is first for one to stand on the bottom rung on the inside of the ladder with his back to the wall of the house, while the other stands with arms elevated, reaching up and holding on to the highest available rung. The one behind the ladder pushes, while the one in front pulls, until the ladder is vertical; the one behind then stands on the lowest rung, and holds on to the third or fourth rung, and gradually leans backward, while the other person allows the ladder to incline over his head, walking backward, with arms erect, and grasping the ladder rung by rung until it has been lowered to such a height that it is possible for him to come from beneath it and hold it with one arm, as shown in Fig 2. After this the ladder may be gently lowered.

During the whole of this time the person at the back must keep his weight as far behind the ladder as possible, the object being to act as a counter-balance to the weight of the ladder; by this arrangement it takes on more or less the form of an L-shaped lever. The stronger person should always be the one beneath the ladder, while the heavier individual should generally hold on to the back.

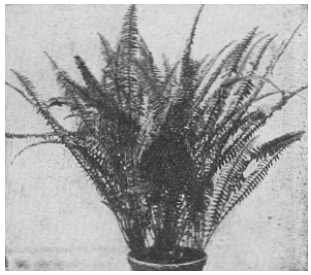
The amateur should, in all cases of doubt, attach a strong rope to the top of the ladder so that it can be controlled. The rope could be twisted round a crowbar or stout iron or wooden bar, which might rest across the window-opening, as by carrying the rope in this way it relieves the slack end of much of the pressure, although it makes it more difficult to pull up the ladder. When placing the ladder, care must be taken that the top does not damage the eaves or gutter, or any part of the house. This is prevented by tying old sacking round the ends of the ladder, but mostly by care in raising it.



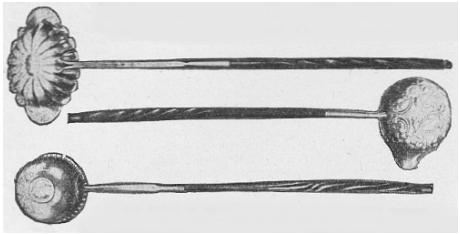
Ladder. Fig. 3. Useful type of ladder giving access to an attic or loft. When not in use it can be drawn up, and is concealed by the trap door. (Courtesy of Loft Ladders. Ltd., Bromley)

Fig. 3 shows a useful type of ladder for giving access to a loft. When out of use it rises up and is concealed by the trap door. *See* Attic; Loft; Step Ladder; Trestle.

LADDER FERN. The genus Nephrolepis, known as the ladder fern, includes useful ornamental ferns. The most popular is exaltata, which may be grown in greenhouse or room window if potted in a compost of peat, loam, leaf-mould, and sand. As a basket plant the ladder fern is excellent. *See* Fern.



Ladder Fern. Ornamental pot or basket plant.



Punch Ladles of silver with wooden handles, 18th century. The lowest one has a coin inserted in the bowl. (By permission of the Director. Victoria and Albert Museum, S. Kensington)

LADLE. A ladle is a large spoon used for serving soup, sauce, and other liquids. Ladles are made of silver, electro-plate, and various alloys. Others are of china and earthenware, generally being made to match the dinner service and fit the sauce boats. Examples of silver ladles are found dating from the beginning of the 18th century. These include ladles used for filling glasses from the punch bowl, many of which had handles of whalebone or a dark wood. Some were ornamented by fitting a coin in a hole cut in the bottom of the bowl; but collectors should beware of spurious examples. *See* Cutlery; Sauce Boat; Spoon.

Lad's Love. This is a name of the plant also known as artemisia, old man, and southernwood. *See* Southernwood.

LADYBIRD. There are about 30 species of the scarlet and black spotted beetle known as the ladybird, and all are of assistance to the gardener in destroying green fly. The larvae are known as garden crocodiles. The most common species is the seven-spotted ladybird.

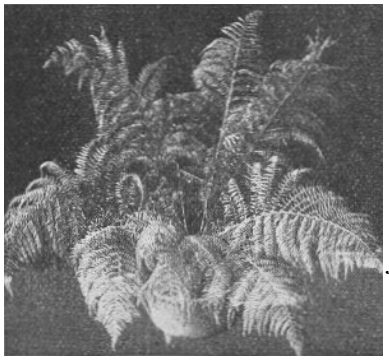


Ladybird

The larvae live for about three weeks, hatching out from buff-coloured eggs laid underneath leaves, afterwards turning to pupae, and in another three weeks emerging as mature beetles. The crocodiles are each able to destroy hundreds of aphides in a short time.

LADY DAY. This is the name given to March 25, the reason being that it is the feast of the Annunciationof the Virgin Mary. It is a quarter day in England and Ireland, but not in Scotland.

LADY FERN. The name is applied to a very beautiful hardy fern belonging to the genus Athyrium. The actual lady fern is A filix-foemina; there are numerous fine varieties. They thrive in ordinary soil to which leaf-mould has been added, and they like shade. Free watering is necessary in dry weather. The dead fronds should not be cut off until spring. They are propagated by sowing spores in pans of moist peaty and sandy soil in a cool greenhouse. *See* Fern.



Lady Fern. Delicate fronds of this beautiful hardy fern, very suitable for indoor decoration.

LADY GRASS. Ribbon grass and gardener's garters are other popular names for Phalaris arundinacea variegata, an ornamental grass, 2 ft. high, with green and white leaves. It flourishes in ordinary soil and is increased by division in autumn. An annual, to which the name Phalaris canariensis is given, supplies the birdseed which is in demand by those who

keep cage-birds.

LADY'S FINGER: The Biscuit. To make these rich biscuits, take 4 eggs, ¼ lb. castor sugar, and ¼ lb. flour, also 1 extra yolk of egg. Work the yolks of the eggs, after separating from the white, with the sugar until of a creamy appearance, and add the flour and any essence desired.

Whip the whites of the eggs to a stiff froth and fold lightly into the mixture. Fold a sheet of kitchen paper to make in it three divisions, lay it open on the board, and pipe the biscuits evenly in rows between the dividing lines. They should be 3 in. long by ½ in. wide. Cover them with sugar, lay the paper on a thick baking sheet, and bake in a moderate oven to a light fawn colour.

To remove the biscuits from the paper, lay the whole sheet on a board or cloth wetted with hot water; the warm moisture will enable the paper to be peeled off without breaking the biscuits.

LADY'S FINGER: The Plant. This is the popular name for anthyllis, a rock-garden trailing plant which bears pea-shaped flowers in early summer. It needs well-drained soil and a sunny place and is increased by seeds sown in late summer; or by division in autumn or spring. The best is Anthyllis montana, which has greyish leaves and rose-pink flowers. Another name for the plant is kidney vetch.

LADY'S MAID. The duties of a lady's maid vary, but she must be a good needle-woman, able to keep her mistress's clothes in repair, to renovate or alter any garment, and to make from patterns or copy garments when required.

In addition she will be expected to know something about hair-dressing, manicure, and face massage. Her employer's wardrobe is entirely in her charge, and she is responsible for its care and for the setting out of the toilette to be worn. She assists her mistress to dress, and may also be expected to do some of the finer washing, such as lace, gloves or evening handkerchiefs.

In many cases the lady's maid is a kind of travelling companion, whose business it is to look after the luggage, get the tickets, and save her mistress from all the routine work of a journey, either by sea or land. Packing and unpacking are included in her work, whether she accompanies her mistress or not. A competent lady's maid can command high wages. *See* Packing; Servant.

LADY'S MANTLE. The name is given to a genus of hardy herbaceous perennials, Alchemilla, of which a few species only are grown. Alpina is a British native with silky hairs and leaves which are silvery on the under surface. It is about 9 in. high, and suitable for the rockery.

LADY'S SLIPPER. The popular name of the Cypripedium group of orchids is lady's slipper. Some of them are hardy; others need greenhouse treatment. The name is derived from the shape of the lip or lobe of the blossom, which resembles that of the toe of a lady's slipper. *See* Orchid.



Lady's slipper. Flowers and leaves of a favourite greenhouse orchid (Cypripedium).

LADY'S SMOCK. The name of Cardamine pratensis (cuckoo flower), a familiar wild plant with pale lilac-coloured flowers in spring. The double variety is a pretty plant.

LAELIA. One of the most popular forms of hothouse orchids is the laelia. The pseudo-bulbs must be placed in pots, pans, or hanging baskets in a mixture of peat, sphagnum moss, charcoal, and sand. They should be watered freely during the summer months, given plenty of sunshine and air, and kept at a temperature of about 70°. In winter the thermometer may be allowed to drop to 60°.

There are many species and hybrids, with flowers that range in colour from white through pink and lilac to purple, and new sorts are produced every year by orchid growers. Propagation is effected by division of the pseudo-bulbs at potting time, or when new growth is developing: *See* Orchid.

LAGENARIA. A hardy annual climbing plant, with bottle-shaped fruit, lagenaria (bottle gourd) is an excellent climber for covering fences, trellises, etc., and belongs to the same family as the gourd (q.v.) It is best raised from seeds sown in April in a heated greenhouse and planted out in early June.

LAGER BEER. Of a pale amber colour, bright and sparkling, full and pleasant in flavour and entirely free from acidity, lager beer is not so strong as English beer, and contains a smaller quantity of alcohol. In brewing it, not only fewer hops but from 20 to 40 per cent less malt is used than in most English beers.

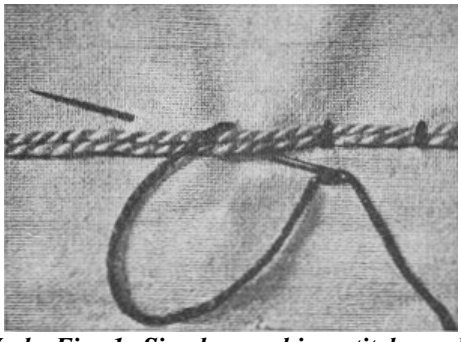
Most of the Austrian beers have a mild and soft flavour, and it is rarely that any of them are as bitter as English pale ales. Pilsener beer, brewed at Pilsen, in Czecho-Slovakia, is exceedingly pale in colour as well as remarkably light. It is even weaker than Vienna beer, but it has a sharp, almost medicinal, bitter flavour due to Saaz hops. *See* Beer.

LAID WORK: In Embroidery. Laid work is used chiefly in Chinese embroidery, for filling

backgrounds and large spaces in designs, or when copying 17th century Italian work in which gold and silver thread are couched down with tiny stitches. A thread is laid, either following the outline of the design or in straight rows across it, or in some filling pattern when the background is to be decorated with laid work, or following the lines of the ground material.

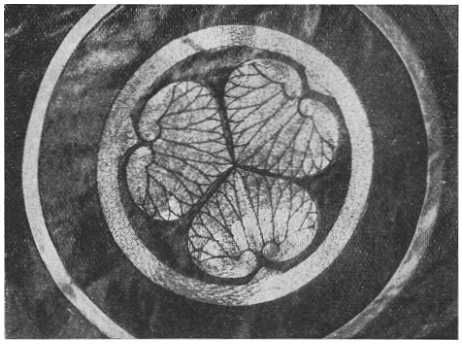
Laid work is employed for designs when the embroidery is wanted in high relief, and where the working medium cannot be drawn through the ground material in the ordinary way, as in the case of cords, chenille, and heavy silver or gold threads. When embroidering with metal threads this work has the advantage of using less of these expensive materials, as they are not taken through to the wrong side of the fabric, but only caught down on the surface.

Designs are frequently first padded all over by means of stitchery in coarse, soft crochet cotton. Floral designs may have leaves and flowers stiffened or still further raised by means of cardboard shapes. The latter can be prepared by transferring the required portions of pattern on to a sheet of cardboard and cutting out the shapes with a sharp knife. Sometimes such cardboard shapes are pasted on to the fabric to be embroidered; in other work they are stitched over with the raised padding cotton to give a more raised effect. The metal thread is wound double on to a spindle; this facilitates the even laying of the thread. For raised designs in which the effect of satin-stitch is desired the double metal thread is taken backwards and forwards across the padded leaf, or other figure, and secured on the opposite side with a tiny back-stitch. Laid work is employed for designs embroidered on leather, suède and felt, and also in conjunction with appliqué.



Laid Work. Fig. 1. Simple couching stitch used in this form of laid work.

Couching Stitches. Several forms of laid work are accomplished by means of different ways of placing the laid threads, and variations in the couching stitch used. In its simplest form couching stitch is shown in Fig. 1, holding down the double thread. Such a stitch has been used for the gold laid work on the embroidered cushion shown in Fig. 2. To keep the metal threads in position a little couching stitch has been worked across them at intervals of ⅛ in. This design has not been raised by padding, but is laid down directly on to the black satin. In the central leaf ornaments the beauty of the design is made by the variations in laying of the gold thread, with the veined couching in black silk going in a contrary direction.



Laid Work. Fig. 2. Black satin cushion embroidered in gold thread couched down with small stitches in black silk.

In Fig. 1 the couching stitch is shown in black, and is left rather loose so that the position of it can be plainly seen; but in the actual work it is drawn down closely, so that it is almost invisible. It is quite permissible to work this stitch obliquely across the laid thread when working an ordinary outline, but when working couched filling, and over very round laid threads, as in the gold embroidery on the cushion illustrated, the stitch should be quite straight and uniform. In couched filling the stitches come exactly midway between two stitches of the first round.

To work, the laid thread can be caught down at the beginning to keep the end in position, then bring the working thread to the right side of material, after fastening it on the wrong side, just above the laid thread, which is on the outline of the design, draw the thread through, and put the needle back under the laid thread in a perpendicular line. Now bring the point of needle through ground material again about ⅛ in. to the left, just above the laid thread, and draw through, when a perpendicular stitch will be seen across the laid thread. The illustration shows the needle in working position, and it will be seen that it is like a hemming-stitch, but set wide apart.

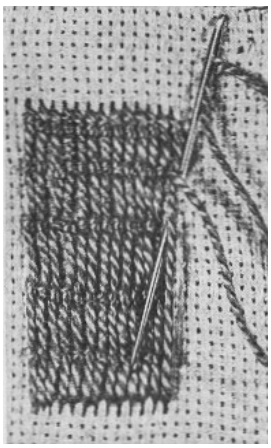


Fig. 3. Showing laid threads couched down with oriental filling.

Scaled couching is formed with loops couched down in the centre, and arranged so that the loops of successive rows begin in the centre of a loop of the previous row and finish in the centre of the next loop of the previous row, so making the forma-tion of scales.

In veined couch-ing, when the first threads are laid in the form of leaf outlines, these are often only caught down with a tiny stitch on either side, but the veins are laid in a reverse direction to the foundation threads, and each vein is couched down as it is laid with the stitch used in oriental filling, and thus holds the first

laid threads in place.

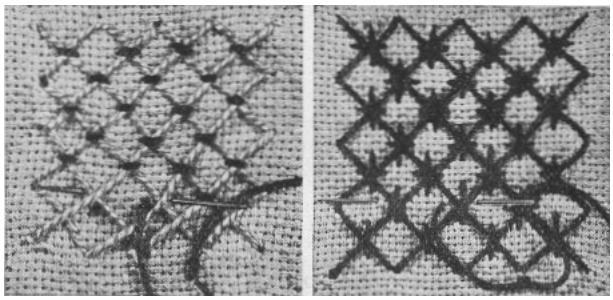
Oriental Filling. This filling is an important stitch in laid work. Used for a background, it is illustrated in Fig. 3. It is shown, worked in silk, following the lines of the soft canvas groundwork, and it is worked here more open to illustrate the stitch better. The work can be done over the fingers, or in a frame for large pieces. To work, proceed as follows: After joining the silk on the wrong side bring the needle up through the material to the right side at the lower edge of the design and pass it down again exactly opposite on the upper edge of the design. Bring the neeedle up again a little to the left of this laid thread, about ¼ in. down. Insert the needle exactly opposite to the right of this laid thread and bring it out to the left again about ¼ in. down, as shown.

When it is drawn through, a little stitch will be formed across the laid thread. The needle is again inserted to the right of where it last came out, and brought out again on the left about ¼ in. down. Repeat the process to the bottom of the thread, after which another thread is laid close up to the previous one, and so on in succession until the background is covered closely so that no material is visible.

Diamond and Diaper Stitch. Other fillings are of threads laid with diaper stitch, and also with diamond stitch. They are both used as embroideries for covering backgrounds or large spaces such as bold fruit designs and conventional flowers.

In the form of laid work utilizing diamond stitch the foundation threads are first laid in a sloping direction from left to right, the second lot of threads crossing these in the opposite direction. This is best worked in an embroidery frame to make sure that the threads are taut without being drawn too tightly.

The second process is the making of the little stitch at each crossing of the threads, and this sets the diamond pattern. Fig. 4 shows this stitch in progress. The needle comes through material to the left of the crossing, and is put down again in a straight line to the right of it. With one movement it can be brought up again to the left of the next crossing. When the needle is drawn through a little stitch is formed which holds down the two threads of the foundation.



Laid Work. Fig. 4. Showing how the small stitch is made at the crossing of laid threads in diamond stitch. Fig. 5. Diaper stitch, showing position needle at the second half of the stitch.

In diaper stitch the foundation threads are also laid obliquely, first in one direction, then across the reverse way. The points of the crossings are then couched down with diaper stitch, which resembles cross stitch, but is made and placed differently.

The first half of the stitch is worked across the junction of the two threads, letting it extend at each side of the main threads, so that it is a distinctive stitch in itself and not a little couching stitch only. The first half of the stitch runs parallel with the warp threads of the material, then the work is turned and the second half of the stitch worked in the same way and parallel with the weft threads. Fig. 5 shows the second portion of the stitch in operation. *See* Embroidery.

LAKELAND TERRIER. In size the specimens of this breed are similar to the fox terrier, but in colour are fawny brown. The coat should be of a wiry texture and close, as these dogs are used for going to ground to bolt fox or badger. They are active and game, therefore must have sound and level teeth, strong jaws, and small eyes. The best weight is about 16 lb. *See* Dog.



Lakeland Terrier. Specimen of this tawny-brown wire-haired terrier, bred for fox hunting. (Photo, Thos. Fall)

LAMARCKIA. A hardy, low-growing annual ornamental grass, lamarckia has silky golden foliage, and when dried is useful for the purposes of indoor decoration. Seed may be sown out of doors in springtime. The grass should be cut and dried during August.

LAMB: In Cooking. The flesh of the lamb is both delicate and digestible, and is of a lighter tinge than mutton when cooked. It takes longer to cook than beef or mutton, for, whether it is roasted or boiled, every portion of the joint should be thoroughly done and frequently basted. When roasting lamb it is necessary to lower the temperature of the oven after the first 10 or 15 min. to prevent the flesh being scorched or hardened. Allow 20 min. to each pound and 20 min. over. Roast lamb is served with clear gravy and mint sauce. New potatoes and green peas, when in season, are the usual vegetables. English house lamb can be obtained by the end of November or the beginning of December. Grass lamb is fit for the table by April, and lasts all summer and early autumn.

When purchasing, one of the chief points to observe is that the lamb is fresh. To judge the fore-quarter, see that the vein of the neck is either ruddy or bluish in colour; if it has a green or yellowish tinge it is not good. The quality of the hind-quarter can be determined by the feel of the knuckle and the state of the kidney; this latter must be small and perfectly sweet and the knuckle should be quite stiff; the flesh

should be firm to the touch. In foreign lamb, the best quality of Canterbury (New Zealand) meat is excellent if well cooked, but the joints should always be of a clean appearance and the flesh a good colour.

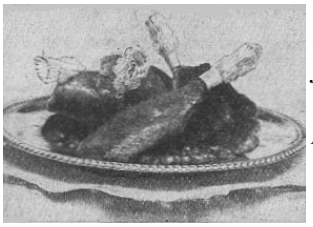
Lamb is cut up first into hind and fore quarters, and these are again divided into legs, shoulders, loins, necks, and breasts. The pluck, known as lamb's fry, is served as a breakfast or supper dish, while the liver, heart, brains, sweetbreads, ears, tail and feet can be used in the preparation of side dishes.

Lamb Blanquette. This is an entrée composed of scallops of cold roast lamb heated in a rich white sauce with the addition of mushrooms. Cut some thick scallops of meat from a cold roast leg of lamb, keeping each one as much as possible the same size and giving them a neat rounded appearance. The quantity required is about 1 lb.

For the sauce, melt in a stewpan 1½ oz. butter, and mix with it 1 oz. flour. Cook these together without browning, and then moisten with ¾ pint clear white stock. Add 6 oz. mushrooms which have been prepared and cut into strips, and a pinch of grated nutmeg. Stir over the fire for a few minutes, then add the meat and heat it in the sauce.

Beat together the yolks of 2 eggs with 2 tablespoonfuls of cream, remove the blanquette from the fire, add the liaison and cook all gently 3 or 4 min. to take the rawness from the eggs and cream. Take care that the sauce does not boil after the mixture is added. Season with salt and cayenne pepper, and squeeze in a little lemon juice. Serve with croûtons of fried bread.

Chops and Cutlets. Before they are cooked, lamb chops should be well trimmed and all skin and superfluous fat removed. They must be grilled or boiled, and served with a pat of maître d'hôtel butter on each one. Sometimes the maître d'hôtel butter is omitted and plain butter is spread over, with a seasoning of pepper and salt and a good sprinkling of chopped parsley. Lamb chops are usually small, and it is well to provide sufficient for a second helping.



Lamb Cutlet. Dish of cutlets fried in egg and bread-crumbs and garnished with peas.

Lamb cutlets should always be cut and trimmed as described for mutton cutlets, and with all cutlets a good shape should be of the first importance. They are good simply broiled and served with fried potato straws. After broiling they need brushing over well with butter and plentifully seasoning. They may also be egged, crumbed and fried, and served with a garnish of peas, or one cutlet as a casserole dish. For this fry the cutlets for a few minutes in butter, then remove them and cool the butter. When cool mix it with the yolks of 2 well-beaten eggs and add seasoning. The cutlets must be dipped in the egg and then into white breadcrumbs and laid in a casserole. Pour a little good gravy over them, add seasoning, 4 tomatoes cut in halves, and the juice of half a lemon. Stew gently for ½ an hour. Serve on a bed of peas and strain the gravy round.

Slices from the centre of a leg of lamb can be made into an excellent dish of cutlets if stewed with good stock to which has been added a bouquet garni and a little spice tied up in muslin. Stew the cutlets 20 min., then take them up, skim the fat off the surface of the gravy and remove the bouquet and the spice. Thicken the gravy with butter and flour made into a roux and add 8 forcemeat balls, ¼ lb. mushrooms, prepared and fried in butter, a pinch of ground mace and the yolks of 2 eggs beaten with 4 tablespoonfuls of cream.

Stir the mixture of eggs and cream into the gravy and cook, but do not let it boil. Heat up the cutlets in the sauce, and serve them with some neatly cut beetroot. One ounce each of butter and flour would be sufficient to thicken 1 pint or more of gravy.

Lamb Pie. To make lamb pie, procure a neck of lamb, remove the chine bone, and saw off the breast part, so that the bones of the cutlets remaining will measure only about 3 in. Separate these neatly and pare off any superfluous fat. Put the spine bones and trimmings into a stewpan with an onion stuck with 2 cloves, a grated carrot and turnip, a few peppercorns, and salt. Cover with cold water and boil at least 1 hour to make stock. Place the prepared cutlets in a meat pie-dish, arranging them in circular form round the side, season them, and fill the centre with peeled, uncooked, and rather small new potatoes or old ones pared and shaped in balls. Pour over these and the meat sufficient stock to three parts fill the dish. Cover with a rich crust as for meat pies, and bake 1½ hours. When the pie is baked add more stock, and serve hot or cold.

Lamb's Head. To make a tasty dish of lamb's head, remove the brains, blanch and boil them, then chop them and make them into a forcemeat, adding the same ingredients as for veal stuffing. Soak, blanch, and boil the head with the tongue and the liver, if procurable. Cook gently for an hour, remove the bones, and lay the flesh neatly on a well-greased Yorkshire pudding-tin. Skin the tongue and cut it into dice with half the liver; mix these with the forcemeat. Cover the flesh of the head with the mixture, and grate over a little lemon rind. Bake in a good oven for 20 min., and baste it well with dripping.

With the liquor in which the head was boiled make a rich gravy, thickening it with butter and flour and flavouring well. Dish the head with the stuffing covering it, strain the gravy round, and garnish with fried bacon and the remainder of the liver cut in thin slices. The bacon and liver can be cooked by the side of the head in the baking-tin. *See* Carving; Cutlet; Hot Pot; Mutton; Pastry.

LAMBETH WARE. A sharp distinction should

be drawn between the two great classes of decorated pottery for which Lambeth is famed. For about a hundred years after the middle of the 17th century several factories in that vicinity produced glazed faience of the style introduced at Delft, in Holland. This Lambeth delft was painted in blue and other colours and comprised tiles, wine-bottles, oval dishes, candlesticks, and mugs.

Pieces much prized by collectors consist of sets of six plates, each bearing a line of a doggerel verse describing a Merry Man. As this ware seldom has a factory mark, it is often difficult to distinguish from contemporary delft made at Bristol or Liverpool, and even from Dutch ware itself. A rosy tinge, showing up the dark clay body through the thin tin-enamel, sometimes helps to distinguish it.



Lambeth Ware. Lambeth Delft mug, with the arms of the Leathersellers' Company, and inscribed Bee Merry and Wise, 1660.

Lambeth faience is a name given at the Doulton works to a form of art pottery consisting of a coloured body painted in decorative designs and fired under the glaze. See Delft; Doulton; Faience.

LAMBREQUIN. This word is now used for a drapery, usually of embroidered linen or some rich material, found on bed testers of the time of William and Mary and of Anne. The carved wood is closely covered with the fabric, which is fastened on and elaborated by festoons of drapery and hanging tassels. In some beds made to-day for period rooms this type of drapery falls from a wooden corona. The name lambrequin is also used for the Victorian arrangement of festooned drapery on mantelpieces and over doors. *See* Tester.

LAMBSKIN. Skins of young or pre-maturely born lambs are tanned with the fleece on and treated as furs, which are used in the Near East to make caps, coats, and cloaks, and are also employed by western furriers. Imitations are made in mohair yarn plush in cream colour for babies' wear as well as in dyed shades with curls of different pattern, length, and lustre. The fabrics can be washed like woollens, and the light colours can be re-dyed to darker shades by the use of wool dyes. *See* Fur.

LAMB'S LETTUCE. The leaves of lamb's lettuce or corn salad, a quick-growing salad plant, are valuable in winter and spring. Seed is sown in late summer in drills 6 in. apart, the seedlings being thinned to 5 or 6 in. from each other. The fresh, young leaves are the best to eat.

LAMENESS. Many causes may produce lameness, including corns, bunions, deformities of the feet or other parts of the lower limbs, whether present at birth or acquired subsequently through injury or otherwise, and diseases of the joints or of the nerves or muscles. The symptoms should be investigated at once in any case and treatment will vary with the cause. *See* Club Foot; Foot; Hip Disease; Infantile Paralysis.

LAMPS: OIL, GAS AND ELECTRIC
Latest Ideas in Practical and Decorative Lighting

This contribution deals with the various forms of portable lamp, and also with gas and electric lamps which are flexibly connected to the mains and may be moved from place to place. Other lighting articles include Acetylene; Air Gas; Burner; Electricity; Gas; Lighting; Oil. See also Bent Iron Work; Lacquer Work; Standard Lamp

The three main kinds of lamp used in domestic lighting are oil, gas, and electric. When oil lamps are used it is generally because neither gas nor electricity is available, though some people prefer them, especially for reading purposes, because of their soft light. Formerly vegetable or animal oils, such as colza and sperm, were burnt in them, but these have now been superseded by mineral oil.

In an ordinary oil lamp the wicks by which the oil is sucked up from the reservoir and supplied to the flame are either flat or circular; in duplex lamps two flat wicks are placed side by side. Whether flat or circular, the wick should be of a size to fit the burner exactly and long enough to allow of about 2 in. being coiled up on the bottom of the reservoir. When so much of it has been burnt away that its lower end only touches the bottom, the wick should be discarded and replaced by a new one. It should be kept trimmed as evenly as possible. For this purpose it is turned down until it is nearly level with the top of the burner, and then the charred portion is gently rubbed away with a rag. This operation should be repeated every time the lamp has been used. Cutting the wick is rarely necessary.

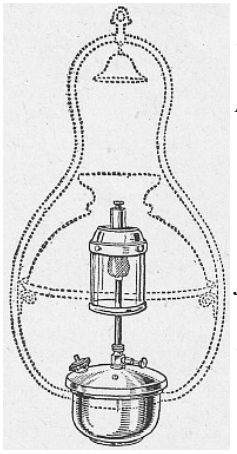
In lighting a lamp, turn the wick down low and wait a little time before turning it up again after putting the glass chimney in place, lest the glass be cracked by the heat. If the wick is turned up too high the flame will smoke and not burn clear. The function of the chimney is to create a draught and supply the flame with sufficient air for proper combustion. By fixing a talc or glass shield, of which various patterns are sold, on the top of the chimney, the current of hot air rising from the flame may be deflected and spread, and blackening of the ceiling above the lamp reduced.

Some lamps are provided with a lever, which when pressed extinguishes the flame. In the ordinary type, when it is desired to extinguish the light, the flame should be turned down low and either allowed to go out by itself or put out by blowing sharply across the top of the chimney, not down it. Sometimes there is an arrangement which automatically extinguishes the

flame should it be overturned or tilted far from the vertical.

Kerosene lamps should be kept scrupulously clean. The oil reservoir should be of metal, not glass, because if the lamp is knocked over, the glass breaks, and there is serious risk of fire. The reservoir should be kept fairly full, the lamp not being burnt continuously for so long a time that the oil is exhausted. The older type has been superseded to a great extent by lamps in which an incandescent mantle is used.

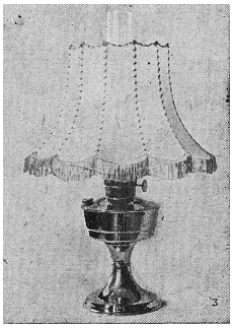
Incandescent Oil Lamps. There are several types on the market, some in which a wick conveys the oil to the special burner, and others in which the oil is vaporised under pressure before mixing with air at the burner. In the latter type a pump is incorporated in the reservoir, or an attachment is provided to which a small air pump (e.g. a cycle inflator) can be connected when starting the lamp. Figs. 1 and 2 illustrate pressure lamps and Figs. 3 and 4 the other type. The pressure lamps shown hold enough oil for about 10 burning hours, and the makers state that a gallon of paraffin oil will give a light of 300 c.p. for 64 burning hours. The intensity of the light is governed by the air pressure at which the lamp is worked. The average candle power of the lamps shown in Figs. 3 and 4 is given as 125, and a gallon of oil lasts about 60 hours.



Lamp. Fig. 1. Left, pressure oil lamp which is easily adapted to an existing fitting. (Tilley Lamp Co.)



Fig. 2. Pressure oil lamp with vase in coloured glazed pottery.



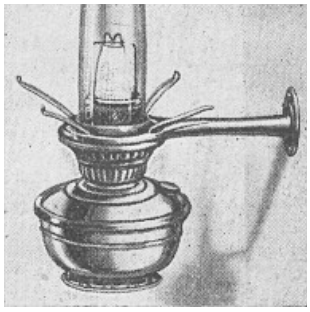


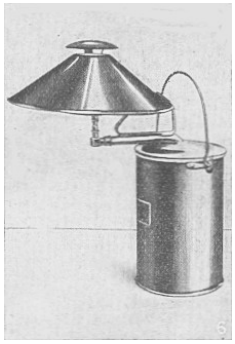
Fig. 3. Aladdin table lamp, in which a wick conveys the oil to the special burner. (Tilley Lamp Co.; and Aladdin Industries, Ltd.) Fig. 4. Aladdin bracket lamp, showing the incandescent mantle, which produces a pure white light.

Gas Lamps. When gas is spoken of in connexion with the lighting of houses, the coal gas or town's gas supplied from public gasworks is usually understood. To a limited extent, however, in places where a public supply is not available, other kinds of gas are employed, such as acetylene and air gas. The former can be utilized in portable lamps for indoor use, and a useful type of acetylene table lamp is shown in Fig. 5. Another type, which might be used in a shed or outdoor workshop, is illustrated in Fig. 6.

Those who rely entirely on coal gas for lighting are not debarred from using table lamps, since it is possible to obtain useful and decorative gas lamps which take their supply from a gas plug point on the skirting, through a flexible metallic tube (Fig. 7). Their use calls for a certain amount of care in the disposal of the flexible connexion, so that it is out of the way, and does not pull on the lamp, and the latter must be placed so that its heat cannot cause danger to fabrics or woodwork.



Lamp. Fig. 5. Acetylene table lamp. Fig. 6. Acetylene lamp useful for a shed or outdoor workshop. (Thorn & Hoddle Acetylene Co. Ltd.)





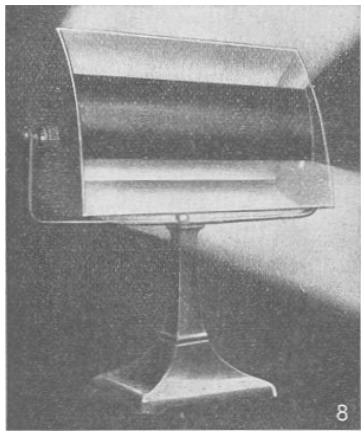


Fig. 7. Gas lamp supplied from a gas plug point through flexible metallic tubing. Fig. 8. Sunray electric lamp which gives out warmth as well as light. (Fig. 8, Modern Electric Homes)

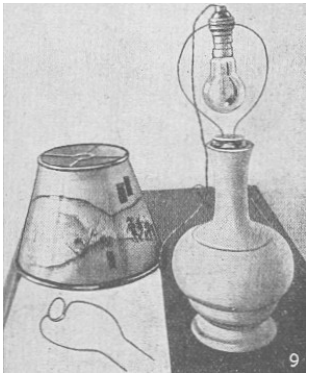


Fig. 9. Electric table lamp contrived from a narrow-necked vase.

Electric Lamps. In addition to the many kinds of electric flash lamp or torch, designed only for

intermittent lighting, there are battery operated hand lamps which will give continuous light for a few hours. These are relatively expensive to work, since the dry battery must be often replaced, so that electric hand lamps are hence adapted rather for use in any emergency that arises.

Electric table lamps for flexible connexion to the mains are made in all styles, from a desk lamp to the more ornate and decorative types with suitable lampshades. The Sunray lamp shown in Fig. 8 gives out warmth as well as light.

Plug Points. When connecting or disconnecting a lamp at the plug point make sure that the switch at the lamp and the plug are turned off. In a safety type of switch-plug (described in the article on Electricity, page 703) the switch is interlocked so that the plug cannot be withdrawn until the switch has first been turned off.

Vases for Lamps. Glass, metal or pottery vases, provided they are narrow at the neck, can be converted into table lamps by means of a cork, a piece of wire, an electric bulb holder, a plug, and a few yards of flex. The cork is shaped to fit the neck of the vase and the piece of stout galvanized or copper wire can be cut to the required length by means of pliers or wire cutters. Failing these, file a notch in the wire and bend it till it parts at the notch. The ends can be sharpened by means of a file so that they will penetrate the cork after the wire has been bent in the middle to form the circular support for the bulb holder shown in Fig. 9, which remains in position by means of its lower ring, when this is screwed up tightly from below the wire circle. The electric bulb is then placed in the holder. The holder, flex and the plug, to fit the existing plug point in the room, can be obtained from any electrician.

The effect is particularly good when these vase table lamps are suitably shaded, and many helpful suggestions will be found in the article on Lampshades. It is often possible to repeat the design or part of the design on a pottery or china vase by tracing it on to a parchment shade and colouring it. Lovely lamps can be made from cut crystal vases of rounded shapes, or even from those of plain glass when these are filled with water dyed to a colour which is repeated in the design of the shade.

LAMPREY. Similar to the eel in general appearance, the lamprey is in season during March, April and May. Lampreys are usually stewed in the same way as eels, or they can be made into a pie. *See* Eel; Fish.

LAMPSHADES: THEIR MATERIALS AND MAKING

An Artistic and Profitable Occupation for Leisure Hours

Among the various articles in our work containing other helpful ideas in connexion with this decorative art are those on Appliqué; Candle Shade; Embroidery; Lacquer Work; Stencilling; Woodwork. See also Electric Light; Lamp; Standard Lamp.

In most homes lampshades are an essential decorative feature. When chosen with due regard to their surroundings they can greatly aid the appearance of a room by day, and are still more important by night, as they can be cleverly employed to make subtle changes in the quality of lighting effects. Even where wall or ceiling fittings are of metal and glass, parchment or vellum shades are probably required for table lamps and standards. Artistic shades for ceiling fittings can also be made in simple pagoda and inverted shapes by the home worker, while many wall brackets are furnished with pendant lampshades or shields for candle lamps.

There is economical and artistic pleasure in producing for a trifling cost something that looks exactly right in the room, and as if especially designed at an expensive shop. To achieve such a result consideration must naturally be given to the particular lamp or fitting and also to the material, colouring and style which will harmonize best with the particular surroundings. When redecorating a room, table lamps or floor standards which have become shabby can be brought into the new scheme of things by restaining and polishing, or into colour relation by being painted with cellulose, enamel or lacquer brush paint. Various ideas for the decoration of lamps and shades to match are given in the articles on Lacquer Work and Lamp.

Materials Obtainable. The way of the lampshade creator is now eased by the great variety of practical materials available for her assistance. Ready-made imitation vellum or parchment paper shades are very cheap in the smaller sizes and are also obtainable in a variety of larger sizes suitable for floor standards. Packets of cut-out lamp shades in assorted shapes may be bought, or, for those who prefer to cut out their own, sheets of imitation vellum and coloured parchment papers are sold. Special lampshade paper is also made for pleated shades and there are coloured strip borders. Wire frames are obtainable to suit all sizes and shapes in standard, pendant and gimbal fittings.

For making-up purposes, galons by the yard in black and gold, to be sewn or cemented on the edges of shades, and leather thongings or coloured silk braids for lacing them, are provided. Ornaments such as beads and tassels are out of fashion now, but a large velvet bow to tone with the colour scheme of the room looks very decorative on an otherwise plain shade.

There are also certain fancy materials cut into shapes and perforated for lacing with thonging. These materials have marbled, mother-of-pearl, or opalescent finishes. A large assortment of lampshades with designs already transferred and only needing to be coloured

are obtainable in many sizes. Separate transfers for designs adapted to various styles of decoration, mandarin and other inks, and also lampshade colours, for painting on parchment or, with the correct medium, on silk, brushes for use with these, clear varnish and cement can all be either purchased or ordered in a good art department, or from firms which specialize in materials for this decorative work.

Nowadays all kinds of materials can be used successfully for lampshades. In a nursery or kitchen a checked or striped gingham looks very well, and a dainty muslin, spotted or flowered in a pretty design, can be ruched or frilled for a bedroom lamp. Linen is also used and is particularly suitable for shields to shade electric candle lamps.



Lampshade. Fig. 1. Pleated shade for mahogany table lamp. It is of peach-coloured paper bordered with chestnut brown ribbon.

Pleated Paper Shades. Simple to make and yet most decorative are shades of pleated paper. They are popular for modern table lamps, either on a plain pottery vase shape, or for the wooden type illustrated in Fig. 1. A charming effect is obtained by employing two colours, one for the lamp, the borders, cord and tassels of the shade, and the other for the pleated paper, which accent colours in the room. The part of the shade through which the light actually shines should be one of the becoming tints ranging from cream to apricot, or from pale pink to deep rose. The exception is green for a reading lamp. On the mahogany lamp stand in Fig. 1, the effect of peach-coloured paper, chestnut borders and silk cord finished with brown and gold bead tassels is dignified and uncommon.

Any good quality of firmly textured and yet finely grained paper will be suitable for pleating. A small-patterned wall paper which answers this description can be used, but most makes are too brittle for successful pleating. The best paper is of the same description as a cream-laid or bond notepaper. The easiest bordering is one of the specially made strips pasted on, or a passe-partout, but a thin silk ribbon can be sewn on, as used for the shade in Fig. 1, with a fine needle and sewing silk to match.

When cutting the paper for a pleated shade, first measure, the frame. Two and a half times the circumference of the base will be the length of paper required for pleating, and two inches extra should be allowed for the depth. To get the required length, several widths of paper may have to be joined. They should be decorated and pleated first.

For this style of lampshade, either a plain border may be used for top and bottom, as in Fig. 1, or a good effect is gained by applying two strip borderings in a broad and narrow width, the lower one about 2 in. from the base of the shade; or stripes may be painted in mandarin inks either side of a pasted gold border. Cut-out motifs can be applied, but these are not really so successful for this style of shade as the plainer borderings.

To pleat the paper, having allowed any paste used to apply decoration ample time to dry, fold in sections of about 1½ in. wide, pressing each fold down firmly with the thumbnail. The folds must be in concertina fashion and afterwards are folded again backwards and forwards to make them each ¾ in. wide. The pleats can, of course, be larger or smaller, according to the size of the shade. Pleating can be practised on a spare piece of paper to be sure that the size of the folds will give the effect desired.

The next process is to punch a row of small holes through which the cord or narrow tinsel ribbon is passed, about 2 in. below the top border of the shade. In some of these shades a lower row of holes is punched for a second cord and tassels. This ensures that the pleats will be held in place, and two rows look well when no other decoration is used. The holes must be cut an equal distance from the edge of each pleat. Before threading them, the lengths of pleated paper must be pasted together and the shade joined. Then the cord or ribbon is threaded through and the shade adjusted on the frame before drawing up, tying and finishing off with ornamental tassels or glass pendants.

Parchment and Vellum Paper Shades. The number of other varieties possible in paper shades makes selection quite difficult. Natural coloured vellum paper is attractive when decorated with a border or a painted design. For those who like to do as much of the work themselves as possible, white parchment paper or imitation vellum shades can be made from sheets of prepared paper.

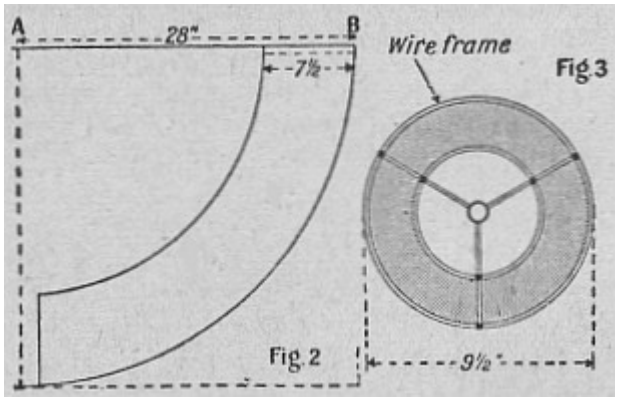


Fig. 2. Diagram showing method of cutting one strip of paper or parchment used for shade. Fig. 3. Wire frame for pendant lampshade, 9½ in. across base.

In order that the shade should set properly it is essential that it should be cut out as shown in Fig. 2, so that the paper used for the shade is a segment of a true circle. Whatever the size required, it should be carefully measured out for depth and cut in this way, with the help of a pair of compasses formed of a pencil, a short piece of string, and a drawing-pin, to which one

end of the string is attached, while the other end is fastened to the pencil.

Pin the paper at its four corners down to a flat-topped table, or a drawing-board, and mark out the segment for the shade with the compasses. If an elaborate design is to be painted, it is easier to decorate before cutting out. Ordinary water colours may be employed, or lampshade colours, or inks. The use of special lampshade colours facilitates putting in a smooth background if it is desired to colour the shade all over. Trace or draw in the chosen design. Work the background to a finish before putting in the colours of the design. A little medium is mixed with the lampshade colour selected, and a flat squirrel hair brush is used to wash in the background. A swab of soft white rag is necessary to smooth the colour over the shade, wiping it off with a light, circular movement.

The use of the medium and rubbing with the rag produces a good surface on which to finish the work. When the background is quite dry the design can be painted in. After this work has been completed the shade can be cut out with sharp scissors and stuck together with strong lampshade cement. Weight the join until quite set, afterwards connecting up the design with additional touches of colour. The latter operation is very essential so that the join does not show.

On a ready coloured paper effective designs can be outlined in black waterproof ink, and metallic bronze powders can be employed with the correct medium. Map varnish can be painted over the shade when dry, leaving a border of dull gold paint half an inch wide, top and bottom, which makes a good finish. This method of decoration is especially suitable for a lacquered standard lamp or for small shades in a room with lacquered furniture. Designs for Chinese scenes can be adapted from those employed for lacquer work, or appropriate stencils can be obtained. In the case of an oriental vase lamp the design on the base should be copied by tracing or adapted by freehand drawing on to the shade.

When desiring to copy the same design for a number of shades to be made of natural coloured vellum paper, the original tracing or drawing can be outlined in heavy black waterproof ink, and this pattern can be traced under the vellum paper, which being oiled is semi-transparent and shows the design clearly through. This method, while facilitating the drawing for the amateur, does away with pencilled lines on the surface of the vellum paper, which gives the work an unprofessional look.

Once the shades are coloured, and the edges joined, making up is simple. For a pendant to be used on a bracket the shade is placed over a wire support as shown in Fig. 3. For a table lamp a gimbal fitting is used. Turn the joined shade on its head, paste the wire of the top of the frame, and the lower ring in the same way. Allow time to set, and then lightly stitch the wire rings to the frame. Take a pair of very sharp scissors and cut off any edges of the shade which come beyond the wires, and then bind the wired edges with a fancy galon sewn on with a fine needle and silk by hand.





Lampshade. Fig. 4 (top left): Parchment-and-braid lampshade with a nautical touch. Fig. 5 (lower left): The Life Guards: a simple idea for decoration.



Fig. 6 (right): Frosted glass lamp base with coloured emblems; red, white and blue stars on the shade. (Photographs, Elsie Collins)

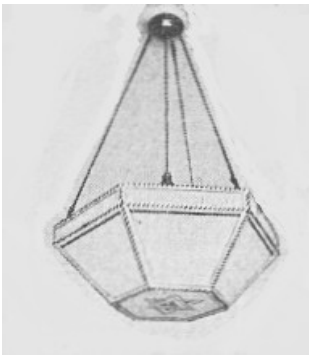


Fig. 7. Inverted shade of vellum paper for a ceiling fitting.

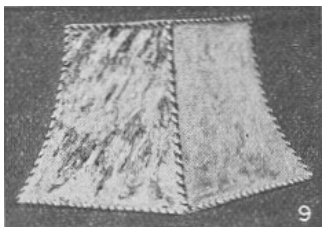
The rough elegance of design, with the ship in full sail, of the parchment-and-braid lampshade (Fig. 4), is well suited to candles, or imitation "electric candles." There are few colour schemes into which this would not fit. Many coloured geometrical designs lend themselves to painting with waterproof inks, as these are transparent, leaving the natural vellum for a few of the lighter portions of the pattern. To dilute these inks distilled water should be used, or rainwater, or water that has been boiled and allowed to cool. Do not use cold water from a tap. Sable or camel hair brushes are best for painting with in this medium, the former for fine work. The military design (Fig. 5) is a simple and effective notion: other regiments are obtainable. For landscape painting moist tube water colours are best used, as they give a softer effect than any other kind of painting, while waterproof inks are best where brilliancy of tone is required, as in a hard, conventional design. This shade has been varnished with clear map varnish on completion.

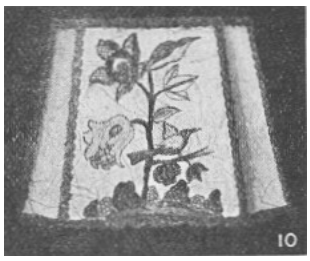
An attractive touch is given to a lampshade with a border design if the vellum is treated with lampshade colour on the inside. The colour should be shaded from deep rose or orange at the top to a pale tint, as this forms a delightful background on which the design at the base of the shade stands out well. Applied designs may be used for these shades. Very simple, but effective, is a border of frieze banding, cut out and applied to a tinted parchment shade, which is after-wards varnished. Chintz or cretonne floral sprays can be cut out and pasted on in the same way, but such decoration is apt to look spotty unless kept to borders leaving the light to shine through the softly-tinted parchment. Silhouettes are purchasable in black and

gold or can easily be cut out from black, silver or gold paper to make a good decoration. In the same way coloured scraps may be used for nursery shades to form amusing borders. Charming colour effect is obtained by staining the electric bulb amber or orange with transparent glass painting colours. Fig. 6 shows a most unusual effect: different motifs on base and shade in unexpected harmony.

Many-sided Shades. Lampshades with many sides are cut to fit special frames. Having selected the frame, pieces of vellum paper are cut exactly to fit the sections, holes are punched about ½ in. from the edge of each separate panel, and the thonging is threaded on to a coarse needle and passed through the shade and round the divisional wires. Such a shade would look particularly well in a study or library, and designs can be copied from bookplates. Fig 7 shows the same method of thonging utilized for an inverted shade. The decoration in this case is a geometrical design on the base carried out in cobalt blue, orange and black inks. The inside of the shade is painted orange.







Lampshade. Fig. 8. Quickly decorated shade; the parchment panels are bought ready for colouring.
Fig. 9. Shaped panels with a marbled effect laced together with leather thonging.
Fig. 10. Shade with painted Jacobean design laced with fancy gold braid.

Very quickly decorated are parchment shades cut out in panels, perforated for thonging and traced for painting with waterproof inks, as illustrated in Fig. 8. The correct placing and size of perforations is clearly seen here as a guide to those who wish to punch the panels for themselves. With the ready prepared panels the frame to fit must be purchased at the same time.

Other materials made up with thonging are obtainable in these shaped panels. The marbled effect seen in the lampshade in Fig. 9 looks well on a pottery lamp, and also on a wooden standard, lacquered in the way described as marbling in the article on Lacquer Work. The mother-of-pearl and jade imitations are also particularly decorative in these fancy lampshade materials, and require little or no further ornament than the thonging, except in the case of a handsome shade like the one in Fig. 10, which is of fancy vellum with a watered surface, the panels being laced to the frame with a narrow gold braid instead of leather thonging. The design, which is painted in inks to resemble Jacobean embroidery, is particularly effective.

The cut glass lamp in Fig. 11 has a beautifully accordant shade in a fancy material which resembles ground glass. The background is softly-tinted for a sunset sky, leaving a border of grey-green water at the base from which the reeds spring. The birds are painted in blue and brown, and the shade is thonged with silvered leather.

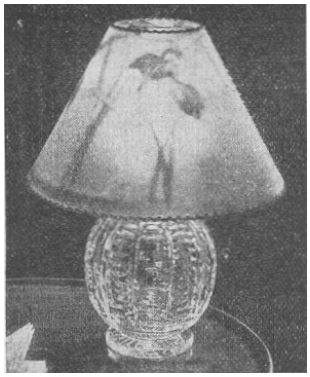


Fig. 11. Shade in a special fancy material suitable for a cut glass lamp. (Courtesy of Webb & Corbett)

Many-sided and dome-shaped shades can also be made up by sewing the various panels or sections to the divisional wires of the frame, and covering the joins with a fancy braid or gimp. This method is also used for making up silk or linen shades. The frame must first be covered with nainsook or similar cotton material cut on the cross in strips 1 in. wide. All downward lines of the frame are covered first. In Fig. 12 a frame ready prepared is seen, and also a shade stitched on to it cut to fit the various sections. When the painting has been completed, the stitched joins will be covered with a light gold gimp.

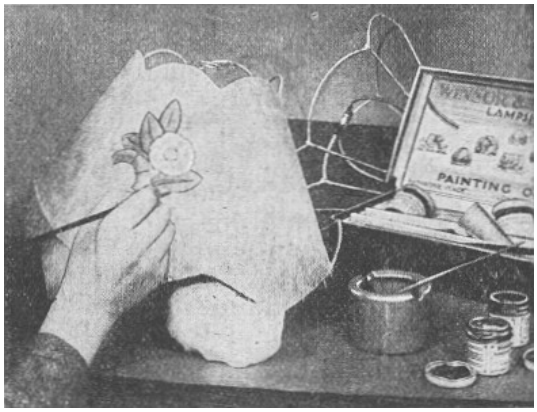


Fig. 12. Painting a shade after the sections have been stitched together to fit the cambric-bound frame.

The vellum or silk is first cut out a little larger than the divisional sections of the frame. Taking one piece at a time, cut it neatly to fit the curved top of the frame. Sew this piece on with blanket stitch, holding the thread with the left hand while each stitch is being taken, to prevent any knotting. Having stitched round the top curve, adjust the sections of material neatly against the frame and cut round the base so that it exactly fits, and sew this also to the cotton binding. Make these stitches about ½ in. apart. Having trimmed the sides to the shape of the wire, leave this panel until the next one has been attached top and bottom, and

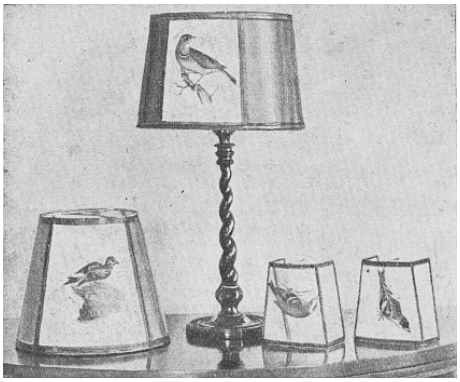
then stitch the two panels together on to the frame.

These must not overlay, but just meet on the frame. Continue in this way until all the sections of the frame are covered, and then if a design is to be painted this may be done before stitching the braid or gimp on to hide all joins and to edge the shade. Cover the downward seams first and then the top and back. Panels may have the designs traced on them before stitching to the frame, but in case of tearing a section during the process of sewing together it is better to do the actual painting after stitching has been done.

Some prefer also to sew on the gimp first, but there is little likelihood of tearing the paper while doing this if reasonable care is taken.

In Fig. 13, prints of birds have been used to make the decorations of central panels for a set of shades bound with ribbon, which would look most attractive in a man's room.

Silk and Linen Shades. When making a silk shade in the manner just described, the binding on the frame must be very tightly wound round the wire, so that it is impossible for it to turn or slip when the silk is sewn on. The silk should be cut to fit with the lines of the grain going horizontally. The panel section must be pinned to the cambric bound frame, stretching the silk so that there are no wrinkles. Sew the two sides down with fine tight stitches and keep the material very taut. Then sew top and bottom with rather less tension or the silk will sag in the middle of the panel. Trim closely when the sewing is done and then begin the next panel. When the frame is covered bind it with gimp, taking care to sew this through to the cambric covering the frame. When a coloured material is used for the covering the binding on the frame should match in colour.



Lampshade. Fig. 13. Group of shades with colour prints of birds used as decorative panels.

Silk shades look their best when left as plain as possible, unless designs are exceptionally attractive. Fringes are now definitely out of date. Pleated silk shades look most attractive made on the same lines as those in parchment or vellum. It is always best to choose silk in a warm shade such as amber, yellow, cream, or tones of pink.

Plain shades covered correctly so that there is not a single wrinkle to spoil the surface are easily decorated with lampshade colours, using the special medium tor painting on silk. Inks can be also used in flat washes and the shading and details of the design finished off with tube water colours. The dome-shaped shade in Fig. 14 has a charming conventionalized design on a mottled background. The panels, top and base are ribbon bound. Such a shade would look well on a table standard in a drawing room.



Lampshade. Fig. 14. Shade made of silk stretched on a wire frame and hand painted.

Shields for electric candle lamps or wall brackets are made on small semicircular wire frames, which are first bound in the manner described, so that no part of the frame is visible, except the wire for fastening it to the electric light socket. Such shields can be of vellum, silk or linen. The last-named is particularly attractive with a bordering design in brightly coloured wools. A medium coarse linen should be used. The stitches must be very neat on the wrong side, or they will not look well when the light shines through the shade. The embroidered linen is well pressed, interlined with thin buckram and lined with pink or orange silk. The edges may be left unfinished and neatened after the work has been stretched and fitted to the frame. The shade must not sag in any way. Having pinned it on to the frame as described in the making of a silk shade, the edges are trimmed and oversewn with ornamental blanket stitch or turned in and sewn down with invisible stitches.

LANCASHIRE CHEESE. The toasting properties of Lancashire cheese form one of its most popular attractions. This good quality is thought by some makers to be due to the fact that it is moulded when in a colder and more pasty condition than are other cheeses. The great difference in the method of making Lancashire and other varieties of cheese is that it is made from curds of different ages, usually of three different days. Thus the acidity is developed more slowly than with other hard-pressed cheese, and the mixing of curds at different stages of acidity causes the loose, friable curd in the resulting cheese.

Lancashire cheese is usually made in two shapes, one of which is large and rather flat, and the other like a small Stilton. The former usually weighs from 44 to 50 lb., and has a diameter of from 13 to 15 in. The smaller size usually weighs about 12 lb., has a diameter of about 7 in., and is about 9 in. high. *See* Cheese; Welsh Rarebit.

LANCERS: The Dance. The lancers, a set or square dance, is an adaptation of the quadrilles, and of English origin. For it at least four couples are needed, though occasionally six dance. Each couple faces inwards, the first (nearest the band) opposite the second, the third on the right of the first and opposite the fourth couple. The women stand on the right of their partners. There are five figures in the lancers, and the correct way of dancing these is at walking

pace; but usually people one-step, or fox-trot, or waltz. The first four figures open with an introduction of 16 bars of music, during which there is no dancing.

First Figure. The first woman and second man advance to the centre, turn, and return to their places. The first and second couple advance and exchange places, the first leading through the second couple. They then return to their places, the second couple in this case passing through the first. This occupies eight bars. Set to corners and turn. Here all the partners separate and the men turn with the nearest women to the left. The movement is then repeated from the beginning three times, the second woman and first man leading off, then the third woman and fourth man, then the fourth woman and third man.

Second Figure. The first couple advance and valse round the centre for 16 bars and return to their places. The side couples divide and join hands with the first and second couples to form two lines, top and bottom. The lines advance and retire. All turn their partners in their places. The figure is repeated with the second couple leading off, then the third couple, and then the fourth. In the case of the side couples the lines are formed at the sides, the first and second couples separating.

Third Figure. The four women advance to the centre and wait. The men advance and join hands in a circle behind the women, while the latter curtsey and pass under their raised arms. The women place their hands on the men's wrists and all dance round in a circle, finishing in their places—16 bars. The four men then advance to the centre, turn back to back, and bow to partners, who curtsey. The four men give their left hands across, put their right arms round their partners, and all chassé round, finishing in their places. The women repeat their lead, and the men follow.

Fourth Figure. The first and second couples valse or one-step up and down the centre for 8 bars. They stop and are joined by the third and fourth couples respectively. In two groups of four they give the right hand across, woman to woman, man to man, then the left hand—8 bars. They cross hands and swing round to the left—8 bars; or half-way left and half-way right. This is repeated, the first and second couples finishing with a different side couple. Third and fourth times side couples lead.

Fifth Figure. In this figure there is no introduction except a prolonged chord when all face partners, present right hands and bow. All then lead off with the grand chain, which occupies 16 bars. Women walk round in a circle to the left, men to right, giving first one hand and then the other, going in and out until own partner is met half-way round, pause and bow, continue the circle until meeting own partner in own place. The first couple or top then lead off with a waltz or one-step down the centre and return to places—8 bars—finishing in own place but facing outward. Side couples fall in behind—third couple, fourth and then second, or bottom couples.

All chassé, cross over, women passing in front, men behind. They return to the other side in the same way, women following the leading woman, and men the same—8 bars. The leading woman turns off to the right, men to the left, leaders up the centre, others fol-lowing—8 bars. All fall back, form lines and advance and retire, turn partners—8 bars. Grand chain is formed again, after which the other couples in turn lead round. The grand chain occurs between each lead round. The figure finishes with grand chain or a general chassé round. *See* Dancing.

LAND: How to Buy. When purchasing an estate or a piece of land there are several matters that require careful attention. There must be a writing, signed by the other party, to evidence the contract; i.e. the purchaser requires a writing signed by the vendor before he can sue him; and the vendor requires one signed by the purchaser. The writing need not be formal; it may be contained in a letter. The signature may be by initials, or even a printed bill-heading.

On an open contract, i.e. one not containing any express stipulations to the contrary, the vendor must be prepared to show a good title for 30 years back in himself or his predecessors. He must also show a title unencumbered by restrictions. The vendor must next submit to the purchaser an abstract, or epitome of the deeds and documents of title, for investigation, and allow the originals to be inspected. If, on looking at the abstract or the deeds, the purchaser finds that the vendor has only a defective title, he can refuse to carry out the contract and claim damages. For this reason, contracts are generally drawn up by solicitors, in which the purchaser bars himself in advance from taking certain technical objections; and binds himself not to claim damages if the contract goes off. The conveyance must be by deed. In all these matters a solicitor should be employed.

The purchaser of land should always be careful to see if there are any easements or public right over it—such things as rights of way. If he is buying a farm, but without the minerals underneath, he ought to be cautious how far he gives the mineral owner the right to let the surface down. A man who buys a farm must remember that if it is in the occupation of a tenant he will, if the tenant leaves, have to settle for tenant-right; but if the owner is in possession there is no tenant-right. Therefore a farmer or market-gardener who sells a farm which he both owns and occupies must make a special bargain with the purchaser if the latter is to pay for unexpired manurial values, standing crops, and the like.

The purchaser of land who intends to build a factory, workshop, or other business premises there will be wise to examine the title to see that it contains no restrictive covenants by a former owner which would prevent him from carrying on the business he wishes to start. Unless minerals are expressly reserved

by the seller, the sale of a piece of land carries with it everything underneath. As our ancestors used to say, the owner of land owns down to the centre of the earth and up to the sky. If land is bounded by a river or stream, in the absence of evidence to the contrary the stream belongs to the owners of the bank, each taking to the middle of the bed of the stream. It should be borne in mind that in law a river or a pond is simply so much land covered with water. *See* Building; Contract; House.

LANDAU. This is a four-wheeled carriage. It has a divided top, so that the whole can be either open or closed. The word landaulette is sometimes used for a small landau, but these carriages are not often seen to-day. The diminutive landaulet, or landaulette, was sometimes used of a small landau or coupé. *See* Carriage; Driving; Horse.

LANDINGS: DECORATION AND ARRANGEMENT
How to Solve a Difficult Furnishing Problem

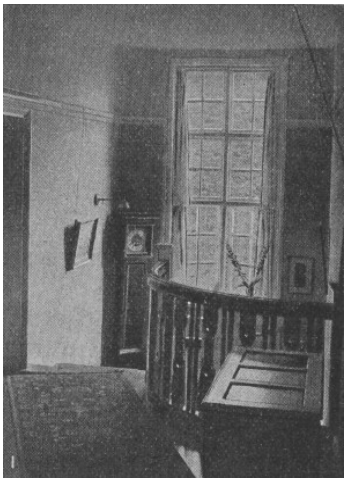
This article connects those on Hall and Staircase, to which the reader is referred, and also to such headings as Carpet; Linoleum; Wallpaper.

It is probably due to the difficulty of making landings and passages attractive that so little attention is given to their furnishing, except to hang pictures and ornaments that are considered out of date and unsuitable for the living-rooms. This is quite disastrous from the decorative point of view, which requires hall, staircase and landings to form harmonious parts of an important section of the house which must be properly related to the whole.

Landings in terrace houses often present particular difficulty in furnishing and decoration, owing to the narrow floor space and comparatively high walls. If added to these drawbacks darkness has also to be contended with, well placed lighting fittings, a large mirror which will reflect any natural light from windows, and a pale colour chosen for wallpaper, or painted panelling of hall, staircase and landing will help. In some cases it is impossible to have any pieces of furniture on a landing except one piece that will fit into an angle. Corner cupboards are most useful in this connexion. Very long mirrors are better raised from the ground, and a chest, narrow table or some low stand with plants placed in front of them. In this way they give the same sense of space, but no one is likely to try to walk through them.

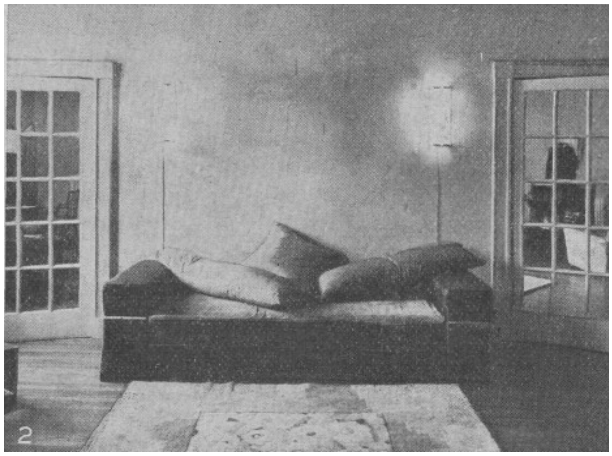
Treatment of Walls. High walls require careful treatment to make them interesting. In selecting the decoration for the hall, which may be quite well lighted by a good staircase window, such as the one shown in the first illustration, thought must be given to the landings above, which may be merely dark passages. In this instance the temptation to choose a heavy patterned tapestry paper or brown panelling effect which would not be suitable throughout has been resisted. Light artificial silk for curtains, plain tinted paper, deep cream paintwork and ceiling, the polished surfaces of floorboards, stair rails and chest, patterns confined to the oriental design of the stair carpet and the well placed pictures: all give a feeling of light and space. The landing appears furnished, though actually there is only room for the grandfather clock in the stair angle and the oak chest.

The halls illustrated previously may be studied for suitable ideas of wall decoration. The applied landscape motif shown with a light marbled paper is especially suitable for repetition on narrow passage landings. When panelling, either real or simulated, is used for the hall it is possible to reduce it to a dado height for the staircase and landings. It is a good plan to fix a rail similar to a chair rail and to cover the lower part of the wall with the panelling. The upper part of the wall above the chair rail should remain light in colour. This is a suitable method of decoration where there is much traffic on staircase and landings. Where lincrusta panelling is used, when this becomes shabby a coat of paint quickly freshens it. When also used in the hall, more attractive for the lower part of the wall is wood panelling, which can be fixed and stained at home. Ready-made sections of panelling can be bought in several different kinds of wood.



Landing. Fig 1 Small landing, rendered individual by the curved stair-head, polished oak chest, and grandfather clock set in an angle of the stairs.

Below.
Fig. 2.Wider landing into which extra light penetrates through the glass-panelled doors of the sitting rooms which open off it. (Fig. **2**, *Humphrey & Vera Joel)*



Floor Coverings. If the traffic on landings is heavy, the floor covering should be substantial. A favourite method is to continue the stair carpet along the passage. If the landing runs at right angles to the staircase, the carpet is cut and laid separately; or, if preferred, body carpet can be used. It must be cut to cover the whole of the floor and must match the stair carpet. This method has a neat appearance when carried out in natural hair carpet.

An alternative method, which has the undoubted advantage of facilitating cleaning, is to cover the entire landing floor with self-coloured linoleum, or one of the new composition or rubber floorings, or parquetry flooring, and to place a rug where it is most required. Labour in cleaning is thus saved, as the rug only requires shaking, and the flooring is kept free from dirt by mopping and polishing.

A more economical treatment for the floor, provided the boards are in good condition, is to stain and wax polish it. Before staining, any cracks should be stopped with some suitable wood-filler, and the boards well rubbed down with medium and fine glasspaper. A varnish stain can be used, but where traffic is heavy this kind of stain is not so serviceable, as it quickly wears.

Care is necessary, when dealing with landing floors that are polished, to see that no loose mats are placed near the top of the stairs. This difficulty can be overcome by sewing special press-stud fasteners to each corner of the mat; these clip into fasteners that are screwed into the floor. The landing floors of old cottages are often very worn and irregular. Fibre matting and dyed string carpeting are both suitable coverings in such cases.

For upper landings in a small house a piece of oak, which furnishes a passage without overcrowding it, consists of four drawers on a raised stand, surmounted by a large but shallow cupboard. Where space is limited, a corner of the landing may be fitted with a hanging wardrobe. Houses not provided with hot linen cupboards will need some good store for linen, and where there is sufficient room the upper landing is a most convenient place for either a large chest of drawers or a cupboard, in which to keep linen, provided it is placed against a dry inside wall.

Larger Landings. Roomy entresol landings give more opportunity for the effective placing of a few pieces of furniture, more particularly if there is a good wide window across the recess. A window seat upholstered with cushions covered in cretonne, printed linen, or artificial silk, and matching the curtain fabric, gives a restful appearance, while a book table is both useful and attractive. Such a space may often be converted into a small extra lounge if a radiator is placed behind a grill under the window seat for winter use. Either side of the recess bookcases may be fitted, stepped in modern fashion, with the addition of one or two small easy chairs, a brightly coloured rug, which tones with the curtains and stair-carpet, such a landing can look most inviting from the entrance hall.

For a squarer type of first floor landing the second illustration shows the possibility of achieving brightness and a spacious feeling by means of glass panelled doors through which the sitting rooms on either side are visible. The glossy light-reflecting textures chosen for the upholstery of the cleverly designed divan, for the floor coverings and painted walls, together with the well placed angled glass lighting fixtures, decorate and furnish this landing space without any crowding or superfluous ornament.

Country house landings are usually easier of treatment. They are either definitely light and spacious or intended to be somewhat cramped, full of the nooks and corners made by the inequalities of floor boards, odd steps, and cross passages. In the latter case, as much light should be admitted as possible from the casement windows, and heavy curtains or jutting out of pieces of furniture should be avoided. Niches are nearly always effective on landings and provide a safe place for a flower base, well coloured piece of pottery, or lamps. Any niche or recess lined with mirror glass in oblong sections will reflect the light decoratively.

LANDLORD. Neither the landlord nor the tenant (except in the case noted below) is bound to repair a house unless he has contracted to do so. A tenant is liable for waste, that is, for damage done by him or his family to the house.

If a landlord has agreed to repair, he cannot be sued on his agreement unless the tenant has given him notice of the want of repair, and he has failed within a reasonable time to put it right. But a tenant is liable without notice from the landlord, because he is on the spot and can see when repair is needed.

Rent Restriction. A landlord can always sue for his rent, and can distrain at common law, but under the Rent Restriction Act he must first get leave from the county court. The same act limits the rent which a landlord may charge for houses within the Act to the standard rent, that is, the rent at which the premises were let on August 3, 1914, or the first let thereafter, plus certain increases up to a maximum of 40 per cent, of the standard rent. Notices of these increases must be given.

The Housing Act, 1936, imposes on the landlord of working-class property a liability for repairs, and he cannot rid himself of this liability by making any special arrangement with his tenant. The act applies to houses in London let at £40 a year or under, and houses elsewhere let at £26 or under. There is an implied condition that such houses are in all respects reasonably fit for human habitation when let. There is also an implied condition that the landlord shall keep them so fit during the tenancy.

If the house is let for a term of three years or more on the terms that the lessee will put it in repair, these conditions do not apply, unless the lease is determinable, at the option of either party, before three years.

In the case of such houses as above, the local authority, if satisfied that repairs are needed to make a house fit for human habitation, may serve a notice on the landlord requiring him within a certain time specified in the notice to execute all necessary works. The time named must be a reasonable one, and not less than 21 days. The landlord has an appeal to the County Court. If he fails to do the work required, the local authority may do it and sue the landlord for the expense incurred. The name and address of the local medical officer of health and of the landlord must be written in the rent book or given in writing to the tenant of a house that comes within the Act. When premises are dangerous or injurious to health, the local authority may make an order for the demolition of the house and may themselves demolish if the owner does not obey. *See* House; Lease; Rent.

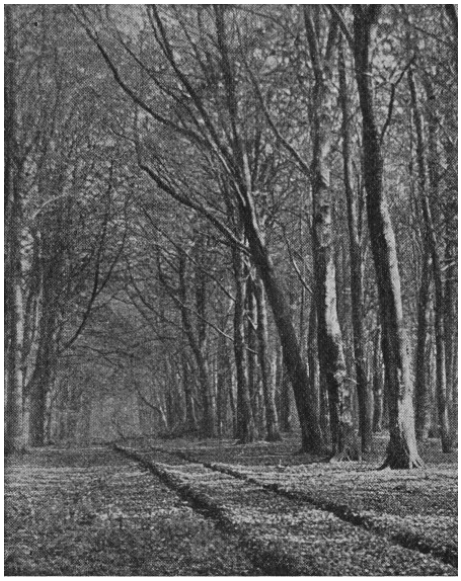
LANDRAIL. A plump delicate small bird, the landrail, commonly called the corncrake, is in season from August 12 to the middle of September. It is usually roasted. When trussing, draw the head under the wing and skewer the thighs close to the sides. The bird should be plucked, drawn, and wiped inside with a cloth dipped in hot water, and before trussing lay inside a good lump of butter with a little chopped shallot and parsley. The time varies for roasting from 15 to 20 min., but the bird must be well basted. Serve with rich brown gravy, on fried crumbs.

LANDSCAPE PHOTOGRAPHY
A Fascinating Branch of a Popular Hobby

In addition to a general article on Photography our work has articles on various kinds of photography, e.g. Colour Photography, and on the choice and use of photographic apparatus, e.g. Camera. See also Developing; Focus; also Light Filter; Panchromatic, etc.

For satisfactory landscape photography it is almost essential to have a camera which has a focussing screen or a direct vision finder, and one that can be set upon a tripod for time exposures. The camera that possesses only the small so-called brilliant view-finder is almost useless, for the picture which can be seen in it is not only misleadingly bright, but it is far too small, and rarely shows accurately what will be found on the plate. The best help in composing a photographic picture is given by a focussing screen with a hood.

Composing a picture photographically means nothing more than selecting the best view point. To do this it is necessary not only to see how it looks to the eyes, but what the camera sees—which is a very different thing. The eye will miss objects in the foreground which, on the focussing screen, will be found to be too prominent, or to be out of focus because they are too near the camera. An insignificant bush, or even tall, waving grass may cover part of the plate with an out-of-focus blur. With a brilliant view-finder they would not be noticed, and the photograph would be spoilt. If the camera has no focussing screen, a direct vision finder, through which is seen the actual portion of the view which will appear on the plate, provides a fairly satisfactory alternative, particularly if the photograph is to be taken with the camera held at the level of the eye.



Landscape Photography. Fig. 1. Woodland view showing distance and interest gained by sharp focussing of foreground detail.

The size of the camera is largely a matter of convenience. Such good lenses can be obtained with the modern small camera that satisfactory enlargements can be made from 3½ in. by 2½ in. negatives up to 12 in. by 10 in. A good tripod is essential in order that lengthy exposures may be given when occasion requires. A light aluminium one is best if much tramping about the country is to be done. It should be fitted with a ball and socket head so that the position of the camera itself may be adjusted without having to move the tripod legs with every change of position.

The amateur will find it best to use ortho-chromatic plates or films if he does not use panchromatic, which are generally preferred. Whichever he uses he should have one or two light filters to render the different tones. If he uses panchromatic plates or films, light filters are essential. The advantages of panchromatic plates or films are explained under the heading Panchromatic.

Only flat, white, toneless skies can be obtained with ordinary plates or films. Even if brilliantly lighted clouds are not present the tone value of the sky will be better represented on orthochromatic or panchromatic plates. No sky is completely toneless, whatever the weather conditions, and a photograph which represents it as a blank white space is false and inartistic.

For photographic purposes all landscapes should be viewed as series of different tones. The beginner is very apt to be taken with the beauty of the colour in the view before him, forgetting that the camera can only record the colours by monochrome tones of varying depths.

Some Useful Hints. The following hints will be of use to the amateur in landscape, but he should remember that the best results are only to be obtained by practice, by cultivating an eye for the composition or making of a picture, by severe criticism of his own photographs, and by the study of the work of others.

A common failing is a lack of sharpness of detail in the foreground of a photograph. The eye insists that objects near at hand should be sharp and clear to be convincing or satisfying. Fuzziness or woolliness of foreground objects betrays carelessness in the photographing, or failure to observe that some objects are too near the camera and out of focus. This does not mean that every object from the foreground to the farthest distance should necessarily be sharp and hard. An all-over sharpness destroys the atmosphere of the picture and brings its distant parts forward in an unpleasing fashion. Do not therefore stop down the lens too much in an effort to get sharpness.

Do not attempt to get too much on the plate at once. Conflicting interests particularly should be avoided. A primary rule in composition of any kind is to concentrate the interest. Everything in the view chosen should therefore be in harmony with, or subordinate to, some main feature. The view point should be shifted until the best possible composition is obtained.

The eye should be led on from the foreground through more or less clear middle distance to the more distant part of the scene, which should be comparatively soft. The best method is often that known as differential focussing, which, with moderately good lenses, gives very pleasing results. This means that while the foreground is moderately sharp, the focussing is so arranged that the more distant parts are progressively, though perhaps slightly, out of focus, trims the planes of a picture can be separated and a feeling of distance gained.

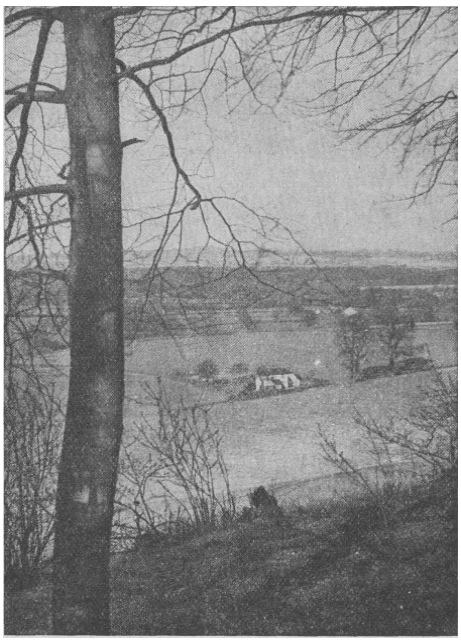
The amateur should not be misled by the grandeur of a great open space or of towering hills. Their small size in the resulting photograph is inevitably disap-pointing unless something is contained within the photograph to suggest distance or height.

The foreground of a landscape photograph should always have something to concentrate the interest and lead the eye onward. An example of this is seen in Fig. 1, where the cart tracks and sun on the beeches are the principal points of interest in the foreground. This is also a case of differential focussing. Had the trees in the farthest distance been as clear as those in the foreground all sense of depth in the wood would have been lost. Another method frequently adopted in building up a landscape photograph is to get the foreground interest and to make the distance recede by using trees as a frame. An example is seen in Fig. 3. This framing effect is the secret of much of the charm which photographs of scenes through archways often possess.

Finally, the amateur landscape photographer will be well advised to attempt no photographs unless the sun is shining. Grey weather inevitably gives grey and flat photographs; the best times are perhaps early morning and late afternoon, when the shadows are long and the light contrasts are great. At these times a suggestion of mist softens distances.



Fig. 2. Above, open landscape view from a hill-top in which the eye is led from the foreground by the chalk road. Distance is given by differential focussing. The three subjects reproduced are from panchromatic plates.
Fig. 3. Tree used as a frame for a view from a hillside, giving both foreground effect and throwing distance into proper perspective.



LANGSHAN. This is one of the best all-round breeds of fowl, noted for combining good laying with excellent table qualities. Though principally bred in black, there are white and blue varieties, the plumage of the first-named being of a beautiful metallic green sheen.

It is conspicuous by its stately carriage, and the legs are slightly feathered, the feather line running down the outside of the legs to the toes. The hens are quiet and docile, making reliable sitters, and they lay a good-sized dark brown egg. The hardiness of the breed adapts it to all climates, positions and soils, and it also

does excellently in confinement. *See* Fowl; Poultry.

LANOLIN. Lanolin or hydrous wool-fat, which is obtained from sheep's wool, is a commonly used basis for ointments. As it is readily absorbed through the unbroken skin, drugs to be absorbed through the skin, especially mercury, are frequently incorporated with it. Lanolin is softer than ordinary woolfat, and as it penetrates into the skin it is a favourite basis for wrinkle-removing creams, skin foods, etc.

LANTANA. A shrubby plant, with verbena-like flowers of various colours, lantana is suitable for the greenhouse and for planting out of doors for the summer months. In autumn the plants must be lifted, potted and kept in a heated greenhouse. A compost of loam, leaf-mould and sand is suitable. Propagation is by cuttings in August; if repotted in spring they will be ready for use in summer flower beds early in June. The tops must be cut off to induce the development of side shoots. If the plants are kept for several years they should be pruned and repotted in spring.

LANTERN. A lantern is a transparent case enclosing a lamp or source of light, and it is found in numberless designs and types. The Chinese lantern, made with decorated paper and provided with a candle or nightlight, lends itself also to illumination by electric lamps. The hall lantern lighting fitting is commonly made with inserted panels of glass, suitable for gas or electric light, as well as oil lamps or candles.

The bull's-eye lantern has a small lens that throws a concentrated beam of light to a considerable distance. These are usually made with a device to cut off the light by turning the top, which turns an inner piece shaped like a tube and pierced with a hole for the passage of the light; thus when the tube is turned the light is obstructed.

Various types of folding lantern are suitable for campers and for holiday purposes, as they can be packed into small compass; they are available for oil or for candle illumination. Magic lanterns are optical projectors.

The first attention required with lanterns is to keep them clean. This applies to all types, but more particularly to those in which paraffin oil is the illuminant. Paraffin has a natural tendency to creep and cover everything with a film of oil, and unless this is removed with a dry cloth the lamp will smell in an objectionable manner, and the light will also suffer. The wicks should be kept well trimmed by smoothing them with a piece of flat wood wiped over the top of the wick when it is just above the level of the wick tube. To get the best illuminating results, the glasses must be kept in a perfectly clean condition.

LANTERN SLIDE. A lantern slide is a photograph on glass intended for showing on an enlarged scale on a screen by means of an optical or magic lantern. The standard English size of a slide is 3¼ by 3¼ in. Plates of this size are sold coated with lantern or transparency emulsion. They may be obtained of either gaslight or bromide emulsion.

Lantern slides are made from photographic negatives. If the negative is a small one, or if only a portion of a large negative is to be utilized for the lantern slide, the latter is made by contact. The negative is placed in an ordinary printing frame, a sensitive lantern plate laid film to film with it, and, after the two have been pressed firmly into contact by springing in the back of the frame, the negative is exposed to the light of an electric bulb or incandescent gas for a time ranging from a second or so to several minutes, according to the density of the negative and speed of the lantern plate.

If the whole subject of a larger negative is to be included in the lantern slide, the reduction process is used, the large negative being photographed on to a lantern plate, using any convenient camera. A usual plan is to fix the negative in a frame attached to one end of a board; at the other end the camera is secured by means of a screw passing through a slot in the board, so that the position can be adjusted for focussing. The plate is then developed, fixed, washed, and dried.

Formulae for the solutions are given in the instructions for every commercial lantern plate.

To complete a lantern slide, a black paper mask is attached to it so as to cut off some of the margins, and give an exact shape to the picture. Two white paper disks, about ¼ in. diameter, are stuck on the part of this mask above the picture. They are required as a guide to the lanternist when showing the slides. A clean cover glass is bound to the lantern slide with a gummed strip of paper. *See* Gaslight Paper; Optical Lantern; Photography.

LAPAGERIA. This is a Chilean evergreen climbing plant with slender stems and bearing large rose-red or white drooping lily-like flowers in spring and early summer. It likes cool conditions and thrives in a greenhouse facing north or east. A winter temperature of 40-45 degrees is high enough. In mild districts it can be grown out of doors on a partially shady wall. If trained on wires beneath the greenhouse roof it is very beautiful when in bloom.

LAPDOG. Among the small pet dogs favoured especially by women and often termed lapdogs is the King Charles spaniel (q.v.), the pug, the toy black and tan terrier and the Yorkshire terrier. The first-named is the black and tan variety of the old English toy spaniel, the others being the tri-colour, ruby, and Blenheim, which has rich chestnut red markings on a white ground.

In later times the Pomeranian came into fashion, at first too big to justify the appellation lapdog, as well as the Brussels griffon, which is quite small. The little Japanese at one time looked like becoming very popular, but was ousted by the Pekingese. Attempts

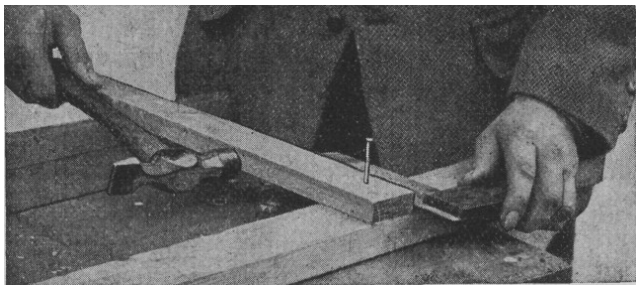
have been made to acclimatize the papillon, or butterfly dog of the Belgians, so called from the characteristic shape of his ears. *See* Dog.

LAPEL. The lapel is that part of the breast of a coat or overcoat that is turned back. The exact size and shape of the lapel, both on men's and women's coats, varies with the fashion, but their correct set is one of the marks of good tailoring.

LAPIS LAZULI. This is a mineral which has a very beautiful azure or ultramarine blue colour. Sometimes the stone is necked with white spots and bands. It takes a good polish, and is used for ornaments and for chains of beads. In jewelry it is best suited for daytime wear, as it appears almost black by artificial light.

LAPPED JOINT. In the simple form of joint known as lapped joints, one part overlaps the other, and the two are glued or nailed together. The lapped joint has been developed in many directions, as, for example, the lapping dovetail, in which the overlapping portion is dovetailed to the other portion. A lapped halving joint is one in which the one piece overlaps the other, and half of the substance of each is cut away so that their surfaces are flush.

Assuming that an ordinary lapped joint is to be made at right angles, the angle may be attained by the use of a square, as shown in the illustration. The upper piece of wood is set in place by the edge of the square, which is applied to it as a guide. The first nail is then driven and the accuracy again tested with the square, and if all is in order the jointing is completed by driving the remaining nails.



Lapped Joint. Showing how to set the two parts of the framework square and true before hammering in the nails.

Screws are put in on the same system, but in this case the gimlet is used to make the hole for the screw, and the work tested as before. In either case the parts can be adjusted by tapping them with a hammer or mallet to set them square after the first fixing has been made, as the two parts of the joint will then hold together by the friction between their faces.

When a square-cornered frame is to be made, as for a packing case, it is preferable to make the joint between two ends first, thus making two L-shaped parts, and then to join up these two, rather than to attempt to join up all the corners and then to expect them to come square. If the former method is followed it is known that the two opposite corners are square, and it is then an easy matter to adjust the remaining two corners. *See* Amateur Carpentry; Dovetail Joint; Joint, etc.

LAPPET. The name denotes the process by which the goods are woven on the lappet loom, fitted with a special attachment. Lappets are cotton muslin with white or coloured dots, sprigs, or other simple designs formed by one continuous thread, and looking as though they had been embroidered on the cloth. They are considerably cheaper than muslins embroidered by a separate machine. Loose ends of thread are left at the end of each pattern. They are used chiefly for summer wear and are suitable for window curtains.

LARCH. The common larch (Larix europea) is a hardy non-evergreen tree which is ornamental in spring, when the young growth contrasts with the brown trunks and red cones; it reaches a height of 70 feet or more. It is good as a plantation tree, apart from the value of its clean, straight stems. In damp sites and on stiff soil it is particularly liable to the attacks of a fungus.

A closely related tree is the golden larch (Pseudolarix kaempferi), so called because of the autumn leaf colouring.

Uses of the Wood. The heart-wood of the European larch varies from a yellowish white to a reddish brown, and is usually straight grained. Its lightness and durability have brought it into use for sleepers, pit props, scaffold poles and ladders, while in carpentry it has the merit of being comparatively free from large loose knots. Its straight stems are welcome to the flower gardener for pergolas and arches or rustic bridges. Old pieces of larch with the base charred, creosoted or otherwise treated with a preservative, last many years. *See* Arch; Wood.

LARD. To be genuine, lard should be clear and colourless, but firm to the touch. It is obtained by melting in a pan over boiling water the inner fat lining of the pig, and also the fat surrounding the kidneys. As it melts it should be poured off, leaving the sediment. It is used for making cakes and pastry, either alone or mixed with butter. For all kinds of light frying, lard can be employed with advantage.

It is frequently adulterated by the admixture of the fat of other portions of the pig, also with veal and mutton fat. Lard should be kept in a cool place in a covered dish. *See* Dripping; Frying.

LARDER. In country and the larger types of town houses larders are often allotted a good floor space. In some of the modern houses they are replaced by a ventilated food store, which is practically a big, well arranged cupboard, augmented by a refrigerator. In very small flats perishable food is kept in a meat safe, and storage room is often merely supplemented by a

kitchen cabinet and vegetable rack. Wherever possible, a baby refrigerator should also be installed.

When the larder is separated from the kitchen it should be placed conveniently near. A northern aspect is always desirable, as it is essentially a cool room. If the larder has two windows, one may have glazed glass panes and the other be covered with a fine gauze wire or perforated zinc to exclude flies and dust, and allow free access of fresh air. If there is only one window, it should be kept open with a piece of white muslin fastened over it, which can be secured with drawing pins. The window sills may be lined with tiles or have fitted porcelain enamel covers. The ceiling should be whitewashed, and the floor of concrete, red tiles, or flags. The walls should be tiled, or, failing this, they can be either distempered or painted with sanitary paint or plainly whitewashed. If there is not sufficient ventilation by means of windows, it is a good plan to have a few perforated bricks let into the wall, and the panels of the door replaced by sheets of perforated zinc or wire gauze.

Suitable Equipment. The larder must be well equipped with shelves. Many modern larders have shelves of slate, marble or stone. Fixtures should include strong iron hooks fixed from the ceiling or hanging from iron rods running from wall to wall. Small hooks should also be fixed to the shelves.

In a good sized larder there may be accommodation for vegetables, which may take the form of either special wooden rack shelves or a wire rack hanging from the wall. Some wire covers of different sizes for covering cold meat are necessary, and a few hanging meat safes consisting of muslin stretched over wooden hoops will be useful, also plates, dishes and basins and, a large earthenware vessel for milk. A piece of muslin weighted by beads at the corners should be provided for covering the milk. Butter should be kept in a butter cooler, or in a bowl of salted water.

In a small house or flat where there is no special larder, and a cupboard has to do duty, it is best to set aside certain shelves for fresh foods and to cover such shelves with American cloth, or, better still, with slabs of slate. Meat must be placed in a special small safe. The table safe described in the article on Kitchen is the most suitable for a larder substitute.

Perfect cleanliness is essential in the larder, and the floors and shelves should be wiped daily with a damp cloth. When thoroughly cleaning, all food should be taken out and the woodwork or floor scrubbed with hot, soapy water to which some disinfectant has been added. *See* Kitchen; Refrigerator; Store Room, etc.

LARDING. The process of larding consists of running strips of fat bacon through meat by means of a larding needle. Dry portions of meat, such as the breast of poultry, beef fillet, liver, etc., are those most usually larded. A special kind of bacon can be bought for the purpose, but if preferred the fat of ordinary bacon may be used. The strips, which are usually about 2 in. long, should be threaded through the needle and the latter put in rather deeply across the grain of the meat. A small stitch only should be made and an equal length of fat left at each end. About ¾ in. should be left between each stitch.

The Larding Needle. This is a length of hollow, graduated steel. The thin end is pointed and the thick end is slit into four for the purpose of holding the strips of larding bacon called lardoons. These needles vary both in size and length and are from about 5 in. to 9 in. long.

LARDIZABALA. An evergreen climbing shrub, Lardizabala biternata is familiar chiefly to dwellers in the south and west of England, as it is not hardy in cold districts. It should be planted in spring or autumn in well drained loam, peat and sand. Its purple flowers are borne in early winter, and it may be propagated by shoots struck under glass in autumn. It is chiefly suitable for the greenhouse.

LARKSPUR. This is the name popularly used for the annual delphiniums, of which there are some beautiful varieties. The pink larkspur is particularly attractive. Seeds are sown out of doors in April when the plants are to bloom in summer. *See* Delphinium.

LARVA. The term larva is applied to an insect emerging from its egg-stage in the form of a caterpillar, which may devour the foliage, stems, or roots of plants. Although most of the damage to crops results from the activities of larvae, the prudent gardener will not fail to wage war against the adult insects, be they beetles, moths, or butterflies, because it is during this stage that they deposit their eggs upon growing crops. *See* Insect; Insecticide.

LARYNGITIS. Inflammation of the larynx is caused mainly by cold or excessive use of the voice, the chief symptoms being hoarseness and cough, with difficulty in swallowing food in severe cases, and in breathing, especially in children. The patient should be kept in bed and the temperature of the room should be about 65°. Wring out a piece of flannel in hot water and apply it to the neck, keeping in the heat by covering with a piece of oiled silk. Warm drinks such as barley water or weak tea may be given.

Inhalations of steam give relief; to each pint of water add 1 or 2 teaspoonfuls of compound tincture of benzoin or 10 drops of carbolic acid or creosote. A spray may be used consisting of equal parts of sodium bicarbonate, borax, common salt and white sugar. A saltspoonful is dissolved in 2 tablespoonfuls of warm water.

The chronic form of laryngitis is common amongst singers, clergymen and others. The voice requires complete rest, and the patient must not breathe through the mouth. The use of tobacco and alcohol is forbidden; theatres and crowded places should be avoided. A month at the seaside often works wonders.

Beneficial results are mainly to be looked for by the employment of sprays or inhalations. *See* Inhalation.

LARYNX. The vocal cords of the larynx produce the voice, which is modified by the agency of lips, teeth, tongue, and throat. The larynx is a box formed of cartilage extending from behind the tongue to the top of the windpipe, and projecting in the front of the neck to form the Adam's apple. The epiglottis forms a sort of lid to the larynx.

The vocal cords are two pairs of bands one above the other, which stretch across the larynx a little below the most prominent part of the Adam's apple. The upper pair of these ligaments are known as the false and the lower as the true vocal cords. When stretched they produce a high-pitched sound, when relaxed a sound of low pitch. During inspiration the cords move apart, during expiration they approach one another, and when a sound is produced they come very close together.

LASSAR'S PASTE. For eczema and other skin diseases a favourite remedy is Lassar's paste, which is made up as follows: zinc oxide, 48 parts; salicylic acid, 4; starch, 48; vaseline, 100.

LAST: For Boot-making. The last used by bootmakers is a piece of wood, preferably beech, or iron, in the shape of the foot, usually made in two pieces and hinged, and on this the boot is fashioned. The leather inner sole is placed upon the bottom of the last, and the boot upper, all ready and sewn together, is tacked to the inner sole, thus fashioning the upper to the shape of the last and forming the base for the middle and for the outer sole.

Lasts are made in all sizes, with as many as eight different fittings or sub-sizes to each size. Regular customers of a bootmaker frequently prefer to have their own last, in order to ensure a perfect fit. The foot is measured with a tape or a pedometer, which gives such exact measurements to the last-maker that he can produce a perfectly anatomical model of the customer's foot in wood. Plaster casts are often used for a crippled or otherwise abnormal foot. *See* Boots.

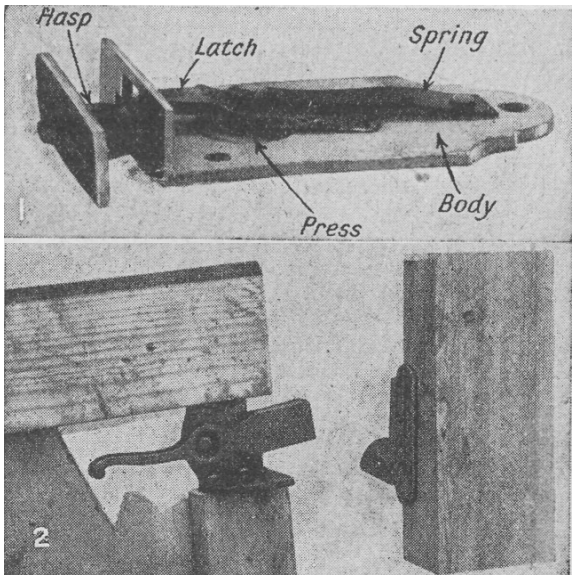
LASTING. Exceptionally firm, strong and heavy cloths resembling linings are known as lastings. They are generally black, but can be made in other colours. House boots and slippers are sometimes made with lasting, instead of leather, uppers. Hard, smooth and unstretching, lasting is useful for the binding of account books.

LASTREA. The shield, male, and buckler ferns belong to Lastrea (nephrodium). Most of them need greenhouse culture, but a few are hardy. The indoor species need a peaty soil and a shaded corner of the greenhouse. Hardy kinds are best when grown in a shady corner in soil to which leaf-mould has been added. The common male fern, of which there are many beautiful varieties, is Lastrea (nephrodium) filix-mas. Propagation is by spores sown under glass.

LATAKIA. One of the most costly items in the tobacco blender's store is the dark, almost black, aromatic leaf which is grown in the neighbourhood of Latakia in N. Syria. It imparts a distinctive flavour to the more expensive mixtures sold in Great Britain, and also makes for cool smoking, but it is not liked by all smokers, and consequently retailers generally supply mixtures without latakia as well as with it. It is treated by fumigation before it is ready for the market. *See* Tobacco. Pron. Lat-a-kee-a.

Latania. This is a greenhouse palm with bright green, fan-shaped leaves. It needs the same treatment as kentia (q.v.).

LATCH. The latch is a device to keep a door, window, or other movable part closed, and does not as a rule require a special key, as in the case of a lock. Simple latches are made in the form of a pivoted bar that drops into a slot, other forms being actuated by a handle or a spring. Some varieties combine the functions of a latch and a bolt; several types of spring lock are known as latches, such as the night latch, which is closed by shutting the door, but can only be opened from the outside by a latch-key.



Latch. Fig. 1. Mechanism of the secret latch.
Fig. 2. Gate latch with part of woodwork cut away to show structure of latch.

The Norfolk Latch. One of the best known types for the home is the Norfolk latch. This comprises a handle, and a plate that is screwed to the door; above the handle is a thumb latch which when depressed raises the other end of the lever of which it forms a part, and this in turn raises the catch which is screwed to the other side of the door, and drops into a striker or notched plate attached to the door frame. Variations are the Suffolk and the Canadian latches, both of which are in substance the same as the Norfolk, though

the Canadian has a somewhat shorter catch.

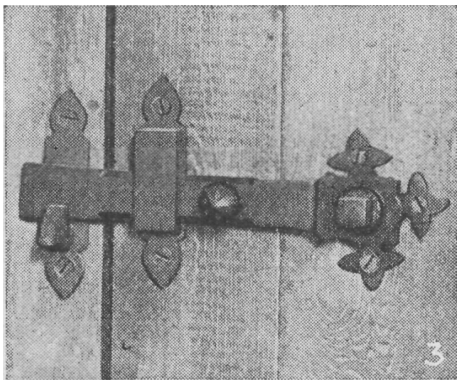
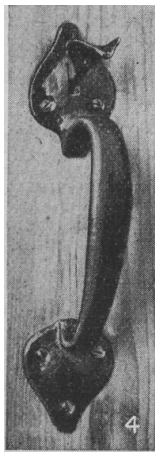


Fig. 3. Gothic latch for an entrance door.

Fig. 4. Thumb latch combined with door-handle.



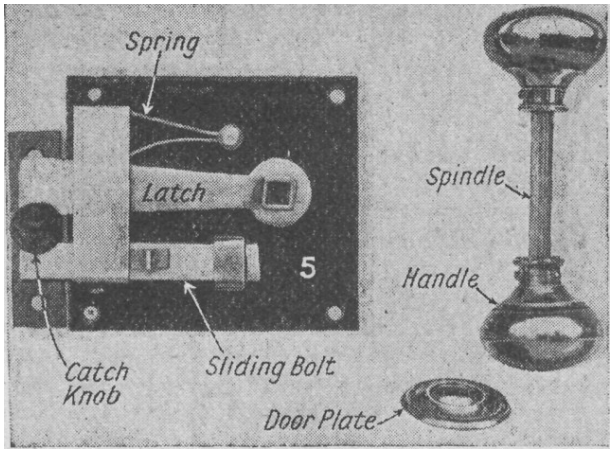
A Secret Latch. The secret latch is a pattern that is useful on cabinets and other furniture, shop fittings and the like. It is a simple spring latch, and is released by pressing on a circular plate let in flush with the surface, so as to be inconspicuous. Fig. 1 is an example of this type of latch.

Other Types. The gate latch which is illustrated in Fig. 2 is made in cast iron, and screws to the surface of the gate. The striker is made, as indicated, to fix to the edge of a frame, or with a flat plate to fix to the face of the gate post. Patterns are also made to build into brickwork, and for stone or concrete gate posts.

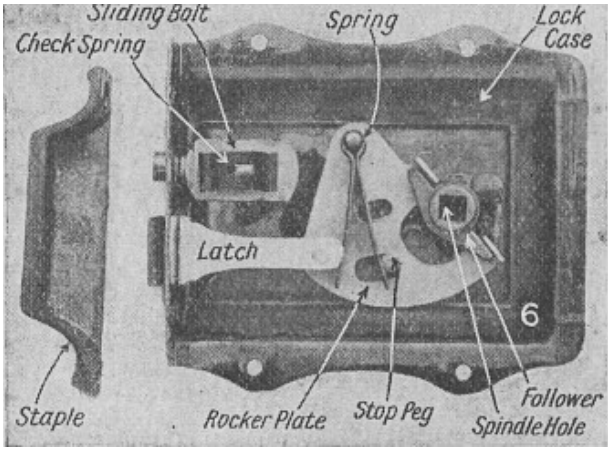
A pattern of latch that has developed from the same style is illustrated in Fig. 3, which shows a typical Gothic gate latch. It is made of malleable iron, finished in Berlin black, and varieties have ring and other shaped handles. There is a square hole in the boss or hub to which a short shaft is fitted. This shaft passes through the door and connects with the boss of the handle on the other side.

The thumb latch seen in Fig. 4 is of the Norfolk type; it is used with the Gothic gate latch, and takes the place of the drop or ring handle and cross shaft. The bow latch shown in Fig. 5, still used in old houses, is a link between the earlier varieties and the modern type of night latch. It has a pivoted lever actuated by a handle, which is shown separately, and the latch is pressed down by a spring. The handles are fixed to a square shaft that passes through a hole in the end of the lever; when the handle is turned the lever is raised and the door released. There is also a bolt which can only be actuated from the inside of the room. When shot, it slides behind the round-headed knob that projects from the striking plate. The lever drops behind the top of the same knob, which thus does duty as a fastening for both lever and bolt.

The rim latch, shown in Fig. 6, is a development of the bow latch, but is enclosed in a case; it has a spring-pressed latch which can be drawn back by the handle and is controlled by a separate bolt and a slider. The night latch is made in many forms; for example, the pin tumbler type, Fig. 7, and the mortise night latch, which fits into a recess or mortise cut into the edge of a door. A handle is fitted on either side of the door, and these are attached to a squared shaft by means of a set-screw or a fixing pin; thus, when the handle is turned the latch is drawn back. In some varieties there is only one handle, on the inside of the door, and a key is needed to shoot back the latch from the outside; in others the outside handle is not attached to the shaft, but directly to the door. *See* Door; Gate; Lock.



Latch. Fig. 5. Mechanism of the bow latch.
Fig. 6. Rim latch which is enclosed in a case.



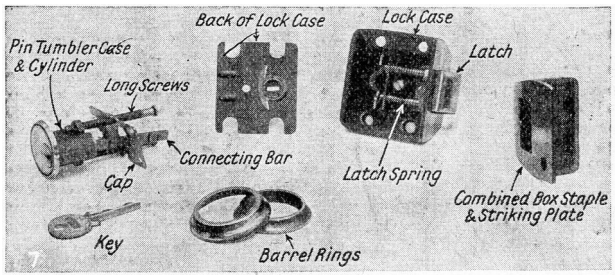
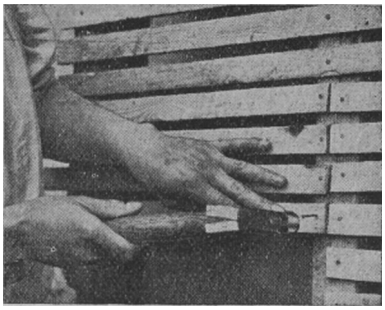


Fig. 7. Constituent parts of pin tumbler type of night latch.

LATH: In Building. The principal use of the lath, which is a thin, narrow slat of wood or other material, is to construct a lath and plaster partition in a building. Laths are required for the repair of ceilings, and are

useful in the home for such purposes as making packing crates and chicken coops, and also for trellis-work. Laths are usually 1 in. wide, and are made in lengths up to 4 ft. 6 in. The sizes are: lath 3/16 in. thick, lath and a half ¼ in. thick, and strong or double lath 5/16 in. thick.

In making a lath and plaster partition a framework of timber is provided to which the laths are nailed. The frames should be so positioned that there is a support for the laths at a distance of not more than 12 to 14 in. apart, when they are at right angles to the studding or framework. The laths should always break joint; that is, the ends should not all come over each other. This may be done by fixing, say, 8 or 10 laths, with their joints on the middle stud; the next set should come on another stud, as in the illustration. If this were not done the vibration would be likely to cause the plaster to crack along the joint, since all the lathing would then bend along the same line. The laths are fixed about ¼ in. to ⅜ in. apart, and the best nails to use are ordinary 1 in. French or lath nails. When it is necessary to fix lathing to a wide piece of wood, as, for example, to a boarded part of the work, the laths must not be nailed directly to it, but to a set of underlying laths or battens at right angles to the face laths. This is done to provide room for the plaster at the back of the laths, as the plaster has to be pressed through the gaps between the lathing to form the key that prevents the plaster breaking away.



Lath. Showing how the laths are nailed to the wooden studs or uprights in the construction of a lath and plaster partition.

Metal lathing is used for the same purposes in the form of a sheet of perforated or expanded metal, the interstices providing the key for the plaster. This lathing is fireproof, and valuable for many building purposes.

Lath Nail. This is a wire nail with a fairly large, round, flat head, used principally for nailing laths to studding, in the early stages of making a lath and plaster partition or other structure. Common sizes are 1 in. and 1¼ in. in length and No. 16 gauge in thickness. *See* Building; Ceiling; Eaves; Furring; Nail; Plaster; Roof.

LATHES FOR AMATEUR WORK

Describing the Different Types and their Uses

This article is complementary to those on Metal Turning and Wood Turning. See also Amateur Carpentry; Centre; Chuck; Drilling; Mandrel; Milling, etc.

A lathe is an indispensable tool to the amateur craftsman, as by its aid all manner of circular objects can be produced within the capacity of the tool. Essentially, the lathe consists of five parts. The head stock comprises a spindle, called a mandrel, which turns in bearings formed in the body of the head stock. The spindle is provided with a flat or V-shaped pulley, generally with several steps of different diameter. The end of the mandrel is screwed for the attachment of various devices for holding the work.

The head stock is fixed at the left-hand end to a bar known as the bed. A movable part, called the tail stock, is usually provided with a spindle, which can be pushed in and out of the tail stock body by means of a lever or hand wheel and screw. The tool rest is also movably attached to the bed, and is used as a support for hand tools. Most lathes for metal turning have a mechanical tool-handling device, known as a slide rest. The next feature is a stand or support of some kind, and may take the form of short feet projecting from the bed and raising it about 6 in. above the surface of the table or bench to which they are screwed; or preferably strong legs well braced together and extending from the floor to the bed itself. Means of driving or rotating the mandrel have to be provided. This usually takes the form of a heavy fly-wheel with steps or grooves turned upon its rim, varying in diameter, and corresponding with the proportions of the steps on the mandrel pulley. In the case of a bench lathe, that is, one which is screwed to the top of the work bench, the fly-wheel is mounted upon a light stand complete with a treadle, forming a foot motor. On other types the fly-wheel is mounted on a spindle attached to the left-hand standard. A flat or round belt transmits the motion from the fly-wheel to the mandrel. Motion is imparted to the fly-wheel by pressing upon the treadle with the foot, working always with a regular, steady motion, so that the lathe revolves at a uniform rate.

Types of Lathes. These range from simple wood-turning machines to elaborate screw-cutting lathes, which have a set of gear-wheels and a long threaded steel shaft known as a lead screw. This is connected to the slide rest, which is free to slide along the bed, and has an independent part known as a top slide, which also has a little lead screw of its own and propels the tool holder. The tool is clamped into the tool post on the top of the tool holder, and it is possible to traverse the tool along the length of the bed, an operation known as sliding. By turning the top slide lead screw, the tool is traversed across the bed. Twisting the top slide at an angle to the bed causes the work to be turned to a taper, and is known as angular turning. Turning at right angles or across the bed is known as surfacing.

Screw cutting is effected by connecting the lead screw to the mandrel by a train of spur gears, and arranging their ratio so that the lead screw makes a certain predetermined number of turns per minute, while the mandrel makes another number of turns. Consequently, if the tool is mounted in the tool post

and brought into cut, so that when the point of the tool touches the work it will remove shavings, a long, continuous groove or screw thread is formed upon the work held between the centres of the lathe.

Modern small lathes, of which three are illustrated, include a variety of mechanical devices. In all lathe work, whether turning wood or metal, the work has to be held in one of two ways. It may be bolted or otherwise attached to a disk of metal screwed on to the mandrel nose, and called a face plate, or held in some form of chuck, in which case the turning operation is generally known as face-plate or chuck work. The other method, especially applicable to the case of relatively long spindles or rods, is to mount them between centres. This means that one end of the rod is supported by a point centre placed in the end of the mandrel, the opposite end of the work being supported by a similar centre in the tail stock spindle. The ends of the rod have to be drilled and countersunk to form a bearing for the ends of the point centres. The next step is to fix a clamp called a carrier to one end of the bar, and to screw on to the mandrel nose a small, flat plate with a peg projecting from it and called a driver plate. The peg engages with the back of the carrier, and when the mandrel is rotated thereby rotates the work. The tool is either a hand tool, or a slide rest tool mechanically held in the slide rest.

Generally speaking, all wood turning, as far as the amateur worker is concerned, can be carried out with hand turning tools. Metal turning is usually effected by the use of the slide rest, even quite inexpensive lathes being now provided with a slide rest.

Figs. 1 and 2 show a Drummond lathe with 3½ in. centres. The leading features are indicated in the diagram, Fig. 1, which shows the lathe arranged as a bench machine. A lathe of another type, especially adapted for the model maker, is shown in Fig. 3. This has a bed of hollow, circular form, enclosing the lead screw. The height of centres is 4 in.

Fig. 4 shows a representative small lathe of American design which is on sale in Britain. This is the "South Bend" Workshop Lathe, with 4½ in. centres. Provision is made for direct electric drive, the motor being bolted adjustably to the stand carrying the countershaft. The drive is thus horizontal, forming a compact assembly. The principal features are indicated by reference letters in the caption to the picture.

Essential Points. Points that should be looked for in any lathe include the following. The mandrel should be made of highest class steel, and rotate easily but without the least trace of shake in adjustable bearings. The moving parts should operate smoothly, easily, and without shake. The centre of the mandrel and the centre of the tail stock should always be in the same line, no matter into what position the tail stock is moved. For wood turning, the fly-wheel should be large in diameter and the mandrel pulley small, as high speed is essential. For metal turning, the fly-wheel should be smaller and the mandrel pulley larger. There should be a difference in the stepping ratios, that is, one large diameter step on the fly-wheel and a small diameter on the mandrel pulley for wood turning. The intermediate position should be provided, and in addition a small step on the fly-wheel, in conjunction with as large a diameter on the mandrel pulley as possible, for turning cast iron. Metal-turning lathes, intended for turning cast iron, are preferably fitted with a mechanical speed-reducing arrangement known as a back gear *(see* Fig. 1). The treadle should be so arranged that if the foot is accidentally placed beneath it the connecting rod will automatically be thrown off the crank pin, otherwise the foot may be severely injured.

The lathe as a whole should be stiff, rigid, and strong, so that when in use it does not vibrate or shake about, as this is fatal to good work. Chucks, tools, and accessories can be added to it from time to time as occasion demands. The bearings must be kept free from dirt and frequently oiled.

See next page for images of lathes.

LATHER. Soap and hot water stirred together form a thick froth or lather. It is used in laundering certain fragile materials which would suffer it rubbed with soap, the garments being squeezed in the froth until they are clean. A lather is also necessary for shaving, special soaps being prepared for the purpose. A quick method of producing a lather for washing is to shread some soap into a bowl, pour boiling water over it and stir with a stick. This will be found satisfactory for most purposes. *S e e* Water Softener; Laundry; Shampoo; Shaving.

LATTICE. A lattice is an openwork structure of wood, metal, or other material, formed by crossing or interlacing strips of material. Such a structure is often used to cover a window, to form a screen, or to protect a doorway. In lattice work all that is necessary is to cut strips of material to requisite lengths and, if working in metal, to drill them at regular intervals for the rivets. When wood is used it will suffice to nail the strips together. To ensure uniformity, the strips may be guided in position by means of a simple space jig, made from a batten having notches cut in its edge at regular distances corresponding to the desired spacing.

In use, one set of strips is laid on the bench or other support, and spaced by placing the notched batten upon them, so that a strip is held in each notch. The first of the next series, which run in the opposite direction, is laid up against the batten, and nailed to the first set of strips. The batten is then removed and turned at right angles, and one of the notches placed over the strip just nailed on. The other strips are put into position into the notches and similarly nailed and fixed. The batten is then removed towards the end of the strip and the joints nailed together.

LAUNDRY WORK AT HOME

Suggestions for Lightening a Domestic Task

(*Continued in page 1249*)

LATHES

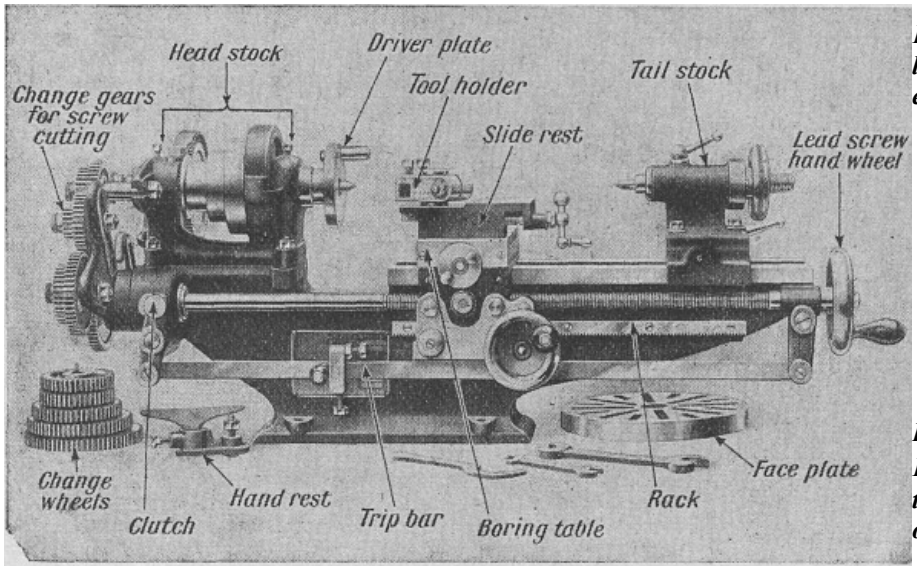
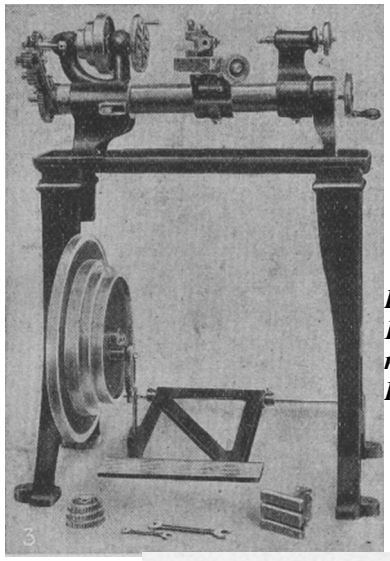
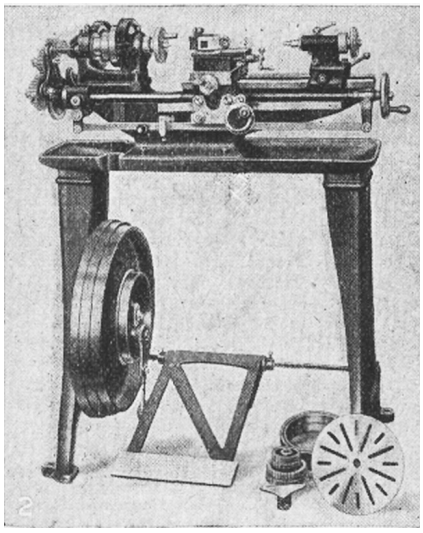


Fig. 1. Drummond back-geared lathe, with the principal parts explained.

Below.
Fig. 2. Drummqnd 3½ inch treadle lathe, the principal parts of which are indicated in Fig. 1.



Left.
Fig. 3. Drummond 4-inch model maker's lathe. (Courtesy of Drummond Bros., Ltd.)



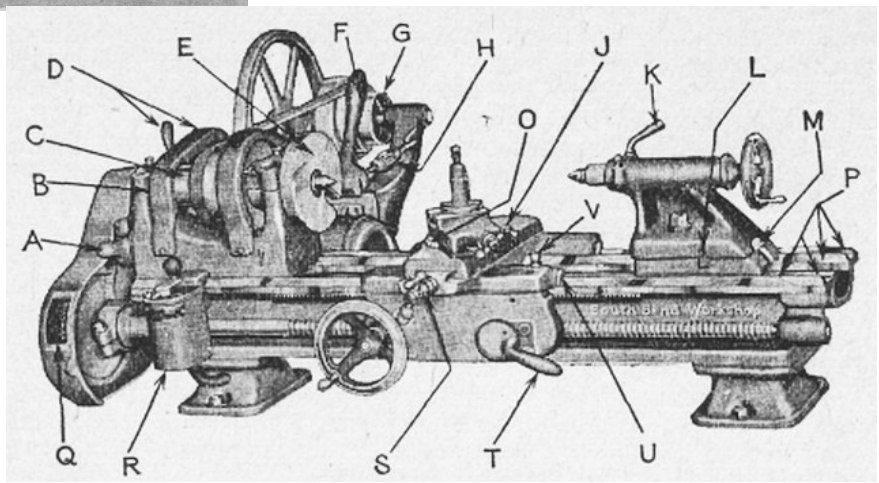


Fig. 4. "South Bend" Lathe. A, reverse lever; B, ball thrust bearing; C, 3-step cone pulley; D, back gears; E, face plate; F, belt tension release lever; 6, countershaft; H, belt tension adjustment; J, micrometer collar; K, tailstock spindle lock; L, tailstock set-over; M, witness mark for aligning tailstock; N, micrometer collar; 0, compound rest graduated 180°; P. V-ways and flat-way on bed; Q, index plate; R, reversing switch; S, felt wipers; T, half-nut lever; V, carriage lock. (R. Melhuish, Ltd., London)

This article will be helpful to the housewife who wishes to economize by doing the laundry work at home. See further the entries on Clothes Line; Clothes Peg; Copper; Dolly; Mangle; Soap; Starch, and those on the materials washed, e.g. Cretonne; Lace; Linen; Silk. See also Bleaching; Ironing; Labour Saving; Stain.

The laundry work for a large family can only be satisfactorily done with space and equipment and a place set apart for its performance. The floor should be of concrete, tiles or brick, with a fall to one corner where there is a drain or outlet, so that the floor can be washed down at any time. There should be good light and ventilation, together with sufficient space for the various appliances. It is sometimes possible to arrange a small laundry in the scullery by converting the kitchen into a combined kitchen and scullery, fitting a new sink and connecting the waste-pipe to the nearest trapped gully. Due regard must be paid to the by-laws of the local authorities. Scrupulous cleanliness is essential in any laundry and the walls should be finished with tiles or washable paint.

The first requirements for this task are an ample supply of hot water and a convenient means for boiling. These requirements can be met in most cases by a portable copper, which is placed in a corner, and the smoke-pipe taken to the nearest flue, or carried out through the roof or walls. The hot water can be drawn off from a tap fixed in the lower part of the copper, while the cold supply is provided by a separate pipe terminating in a tap over the top of the copper. Many varieties of copper are available for heating with solid fuel or gas; it is best to choose one with a galvanized case and tinned copper pan.

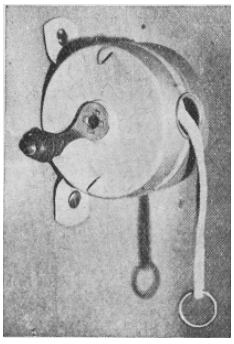
A strong bench should be fixed along one side of the laundry for the washing-tubs, if hand-washing is to be undertaken. If a washing machine is used, less space will be required. There is a large variety of these appliances both electrically and gas driven and also non-gas. The task of washing is lightened by these machines. Compact machines can be purchased from about three to ten pounds by means of which rubbing the clothes by hand is eliminated, the hot soapy water being forced through the fabric automatica11y. Afterwards the garments are removed for rinsing.

A mangle or wringer is also an asset, and small compact mangles can be used even when laundry work has to be done in the kitchen. One variety of mangle fits on to the kitchen table. A wringer is obtainable which is fitted with a table top. Another useful type is combined with a washing machine. Four castors enable this machine to be easily moved about. It has rubber rollers, and pressure is secured for wringing or mangling by screws which operate through powerful double springs.

Probably the chief difficulty for the housewife is the drying of the clothes after they have been washed, especially in bad weather. The most economical plan is to fix cords, or smooth wooden slats, across the ceiling and as near to it as possible, supporting the ends of the slats by ropes which run over pulleys fixed to the walls. By means of the pulleys the slats can be raised or lowered without difficulty. With such an arrangement, if a small amount of ventilation is provided near the top, a heating stove can be lighted overnight and the laundry closed, the clothes being generally dry by the morning without further trouble. Ready-made ceiling drier fixtures are obtainable.

Another plan is to make a cupboard-like structure, preferably with asbestos cement sheets, and hang the wet clothes in it. Hot-air pipes should be led around the interior of this cupboard, and may be heated by means of a small oil stove, gas ring, or other convenient means, much on the lines of the heated linen cupboard. The apparatus may follow the general principle of construction adopted for greenhouse heating, and hot-water pipes can be used instead of hot air.

Other Simpler Appliances. For laundry on a big scale wicker baskets are required for storage of the clothes. Where sufficient space is available a good solid table should be provided, and if possible should be of such a size that one or more of the laundry baskets can be stored beneath it. The irons, soap, scrubbing brushes, etc., should be housed in a cupboard. The use of electric or gas irons not only saves the cost of a heating stove, but keeps down the temperature. Besides the more important furnishing equipment the home laundry requires one or two galvanized tubs, an ironing table or board, sleeve board (essential when ironing sleeves), enamelled basins for washing smaller articles and for starch, a wooden spoon, clothes line, clothes rack or horse and clothes pegs. A wooden dolly and tub may be useful where there is no washing machine. A small washer is obtainable which has a strap that fits over the hand and a surface that squeezes out the dirt without damaging the material, but thus saving the knuckles. The indoor clothes line illustrated is a convenience to the housewife who only has a small kitchen in which to do the washing. The required length of line is drawn out of the container and fastened temporarily by the ring on to a hook on wall or dresser. By a device the handle fixes the line tautly. An attachment with arms is procurable for the clothes horse.

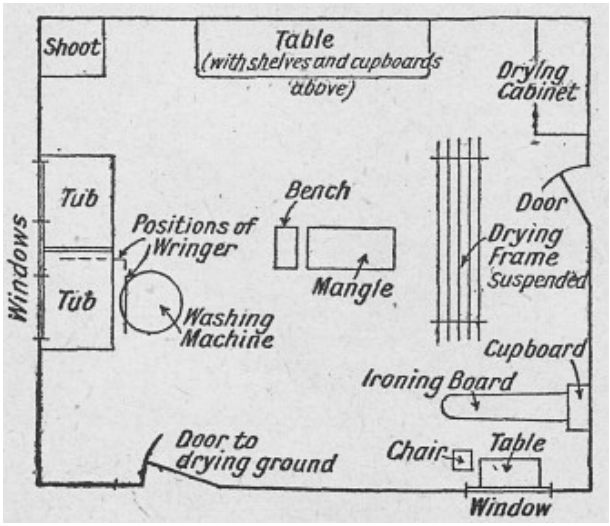


Laundry. Indoor clothes line; the handle can be fixed so that any length of line is made taut.

Practical Suggestions. Unnecessary stooping must be avoided by taking care that washing and rinsing tubs are not placed either too high or too low. Washing machine, rinsing tubs, mangle or wringer should be placed near together to avoid unnecessary steps to and fro.

Select one day a week or fortnight for laundry work and avoid doing any other unnecessary housework on that day. Either a Monday or Tuesday is the best day to choose, as when the weather is bad for drying it

leaves several days in which the drying, ironing, and airing can be completed before the week-end.



Laundry. Arrangement of a laundry, for which a basement room or an outbuilding could be used.

Mend all clothes before they are washed; this prevents rents and holes from becoming further torn during the washing process.

Make soap solution and starch the previous day, if possible. Ecru starch is obtainable which tints and starches curtains, etc., at the same time. Keep in stock hard soap, borax, and washing powder. Soda turns white materials yellow.

Soak any badly soiled clothes overnight in cold water. Remove any stains that may be on the clothes. Prepare the copper and light the fire early. While the water is getting hot, sort the clothes in the following heaps: white and coloured woollens; silks; fine things and table linen, handkerchiefs, bed linen, and upstair towels; coarse things; coloured articles.

If the entire wash is to be done on one day, the silks and woollens should be washed first, so that they may be dried quickly, followed by the coloured things. Entirely fresh water must be used for the white wash, or the clothes will not be a good colour.

Softening the Water. The softening of the water is a problem which must be solved by every laundress before dirt can be removed from the clothes. Where a water-softening apparatus is not installed, some housewives prefer to use borax, others rely on one of the prepared soap powders.

Whichever method of softening is selected, it must be remembered that no cleansing can take place whilst the water is hard and soap curd is visible. All the soap that is rubbed on to the clothes or added to the water, as dissolved soap or jelly, combines with the dissolved minerals in the water and forms soap curd. More soap must be added until there are no minerals left with which it can combine; the surplus soap forms a lather. A lather is merely a sign that free soap is present in the water. When washing new garments that contain dressing, soap curd may appear in water which previously was very soapy. Should this occur additional soap must be added to the water.

Always wash the cleanest things first. Any new clothes and handkerchiefs should be rubbed out separately in a little soapy water. This economizes washing waters, as they do not get dirty so readily. Where no washing aids are available, prepare two baths of soapy water. Rub the garment all over in the first bath; when clean, wring out, turn garments and pillowcases on to the wrong side, and wash again in the second bath of clean water. Any very soiled parts, such as collars, cuffs, and neckbands, need special hard rubbing. Wring the things from the second water and rub on a little hard soap before rinsing.

When washing woollens, fine work or coloured articles, soap flakes are usually the best cleansing agent. Coloured things can be kept without fading if the soapy lather is allowed to cool before use. The garments should be washed quickly, never wrung out if of fine materials, but wrapped separately in clean cloths and the water gently squeezed out by a kneading process.

How to Wash Delicate Fabrics

Small lace handkerchiefs, georgette collars and cuffs, can be put into a preserving jar with a screw top, filled with a warm, soapy lather and shaken vigorously. When clean they may be rinsed in the same way. This method obviates any damage by rubbing the delicate fabrics. Chiffon or net can be washed in a clean muslin bag by placing it in warm, soapy lather and gently squeezing out the dirt. Afterwards the articles are rinsed in the bag by placing it in clean, warm water. Rinse again, in fresh water, until no soapy moisture comes from the bag when it is kneaded.

Only handkerchiefs, kitchen cloths and the heavier white cotton and linen articles should be boiled to keep them a good colour. Underclothing or table linen should not be boiled in the same water as soiled kitchen cloths or towels, etc. Arrange for two boilings. The water in the copper should contain plenty of soap, and it should not be boiling when the clothes are first put in, but should be allowed to reach boiling point moderately slowly. Boil for 20-30 minutes.

The next process is the rinsing and blueing. Take the clothes from the boiler, and rinse them thoroughly in plenty of clean, warm water to remove the soap. If a large wash is in progress it is better to rinse first in warm water, then in cold. Prepare a bath of blue water, and blue one or two things only at a time, as if garments are left in the blue water the colour settles in streaks and is difficult to remove. The same thing results if the blue water is made and left to settle before used.

After blueing, wring and hang those things out to dry that do not need starching. Whilst these are drying, starch table linen, collars, aprons, etc. Things that do not actually require starching, such as pillow-slips, sheets, and lace-trimmed mats, etc., may yet be improved in appearance by passing through starch water, which gives them just a slight firmness. Exactly

which things should be starched depends on individual taste.

Damping and folding are the final stages. Take in the clothes when nearly dry. Those things requiring careful ironing will need further damping with cold water, but woven underwear, towels, etc.. can be folded ready for ironing. These will naturally require a little damping if they have been allowed to get bone dry. Roll up all fancy things tightly and leave for several hours before ironing, preferably overnight. The labour of ironing is minimized if large things that can be folded flat are mangled after damping; this removes a large proportion of the creases in the garments. The clothes are then ready for ironing.

LAUREL. The laurel is grouped by botanists as a section of the group or genus Prunus which includes the almond, apricot, plum and cherry. The common laurel (Prunus laurocerasus) is a vigorous shrub with large evergreen leaves, often used to form a hedge; it impoverishes the surrounding soil and is not suitable for small gardens. Old overgrown hedges may be cut hard back in April. Cuttings form roots if inserted in sandy soil in a frame in August. The Portugal laurel (Prunus lusitanica) and its myrtle-leaved variety are handsome evergreens. The best time to transplant laurels is in May or September, and it is advisable to put in small specimens, because they become established more quickly than large ones.

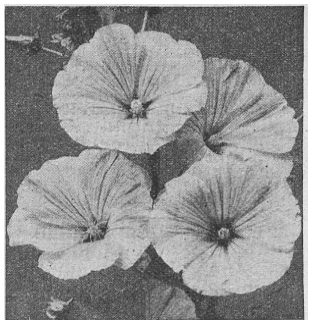
LAURUS. Laurus nobilis, the sweet bay, a favourite evergreen shrub with fragrant leaves, is not very hardy. It is usually grown in large pots or tubs, and if placed out of doors for the summer must be brought under cover before winter and kept safe from frost. In mild districts it may be planted out of doors. Propagation is by cuttings in sandy soil in a frame in August.

LAURUSTINUS. This hardy evergreen shrub (Viburnum tinus) grows 5 to 6 ft. high and bears pink buds which open to white flowers in autumn, winter and early spring. It flourishes in ordinary soil.



Laurustinus. Clustered blossoms of the beautiful winter flowering evergreen.

LAVATERA. The rose mallow (Lavatera trimestris) is one of the most beautiful hardy annuals. There are several improved varieties, e.g. Loveliness, which has large, rose-pink flowers on plants 2 to 3 ft. high. Seeds are sown out of doors in spring for summer flowers. The tree mallow (Lavatera olbia) is of vigorous shrubby growth, forming a bush 4 to 5 ft. high and bearing carmine rose flowers for many summer weeks. It may not survive the winter in heavy soil, but is raised from seeds sown under glass in spring.

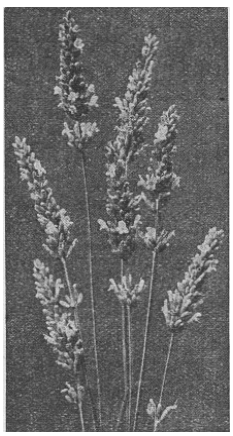


Lavatera. Beautiful rose-pink flowers of the annual lavatera or rose mallow

LAVATORY. A lavatory is a place for washing. The word is sometimes used in the home, but more usually cloakroom is the term employed for it.

The Lavatory Brush. Although chemical salts and acids are available for dealing with the closet pan when it becomes discoloured or furred, the use of the lavatory brush will keep the pan in sanitary condition. The two standard designs are a long, round handle with a dome-shaped brush at the end, and a flat brush similar to a long-handled bath brush. If preferred a flat brush is obtainable with a half-round dome end. Stiff bass, bassine, fibre, or cocoa-fibre are the materials used, a serviceable quality being a mixture of bassine and fibre known as union. *See* Basin; Brush; Water Closet.

LAVENDER: The Plant. The sweet-scented garden lavender is a half-shrubby plant, with greyish leaves and purple flowers. Its thick, ragged-barked stem, 2 ft. high, branches above into a broad bushy head. The flowers are produced in long, erect spikes. It makes an admirable hedge. For the purposes of perfume manufacture it is grown by the acre in Essex and Kent, and to a lesser extent in Surrey.



Lavender. Purple heads of the sweet-scented garden plant.

As a garden plant lavender thrives best on warm light soils, and may be planted either in spring or autumn. The plants should be about 18 in. apart every way. Lavender is propagated by cuttings inserted outdoors or in a frame in September. The proper time for gathering lavender for distilling or drying is when the flowers are fully expanded and fresh. The Munstead lavender blooms very freely and blossoms earlier than the common kind.

Domestic Uses. Lavender should be cut when it is in full bloom and spread out to dry on a newspaper,

either in the sun, on the rack of the kitchen range, or in a hot linen cupboard. When quite dry it may be made up into bags, sachets, or whatever form of scent-container is required.

Lavender bags may be made from organdie or butter muslin. This is cut to the size required, and the sides run up in the ordinary way. A bunch of lavender is inserted, heads downward, and the opening made fast with cotton firmly stitched, or tied with narrow mauve ribbon. The stalks are then cut neatly until only a few inches remain. This method has the advantage of retaining the perfume longer than if the stalks were removed.

Lavender Vinegar. A refreshing toilet preparation with mild astringent property is made by mixing 6 parts of rosewater, 1 part of spirits of lavender, and 2 parts of Orleans vinegar. It can also be prepared from freshly-gathered lavender flower tops. These are dried, placed in a stopped bottle and steeped for a week in Orleans vinegar. Every day the bottle must be shaken, and at the end of the week the liquid is drained off and filtered through white blotting paper or through a filter paper bought from a chemist.

Lavender Water. This toilet preparation is easily prepared at home. Into a quart bottle are put 1 oz. essential oil of lavender, 1 drop musk and 1½ pints spirit of wine. These three ingredients are well mixed together by shaking. The mixture is left to settle, shaken again in a few days, then poured into perfume bottles with airtight stoppers. *See* Scent.

THE LAWN: ITS MAKING & MAINTAINING
How to Get the Best Results with this Desirable Garden Feature

The amateur gardener who is interested in this subject should consult also the articles Garden; Grass; Soil and others of that kind, while, when the lawn is made, those on Croquet; Lawn Tennis will be found useful. See also Drainage; Edging; Spirit Level.

The lawn is an expanse of turf in the garden, generally adjacent to the dwelling-house. If it is to look well and wear well, the laying-out and maintenance are matters requiring careful attention, especially in regard to soil and drainage. Heavy soil in which clay preponderates will speedily stagnate if water does not drain off easily, therefore road grit and leaf-mould should be added while digging proceeds. Light sandy soil requires manure, so that moisture may be conserved and parching prevented during a season of drought.

Large lawns which become sodden should be drained by pipes, laid in the way shown in the diagram. The pipes should be laid about 12 in. deep and slope gradually to a sump or outlet. Where branch pipes meet the main drain they need packing above the junction with slats, tiles, or stones. Open ends of drains must not be near the roots of trees or strong-growing creepers, as these eventually choke the inlets.

Levelling. Levelling a site is not such a difficult task as it appears to be. The implements necessary, with the exception of a true spirit level, are a number of wooden pegs; a, straight-edge board, 6 ft. or more in length; and a strong garden-line. First ascertain the centre level by stretching the line from top to bottom of the plot. Then drive one of the wooden pegs into the highest end of the site to just above the surface of the soil, following this with another peg down the line at a distance something less than the length of the straight-edge. Do not drive it far in at first, but gauge the relative depth by placing the straight-edge on the two pegs, with the spirit level on top, and sinking it further until exact level between the two is secured, carrying on in the same manner the whole length of the line, when a true centre level will result. Cross level must next be ascertained, working on the same principle across the garden, and securing the level from those pegs already in the ground. The whole procedure is made clear in the next page.

Grassing. The two best methods of grassing a plot are by laying turves or by sowing seed, the former possessing the advantage of forming a sward almost at once. It is essential, however, that turf should be of good heart, and free from such weeds as daisy, crowfoot, dandelion, and plantain. Turves are usually obtainable in lengths of 3 ft. by 1 ft., and it is easy to estimate the number required, allowing for spoilage.

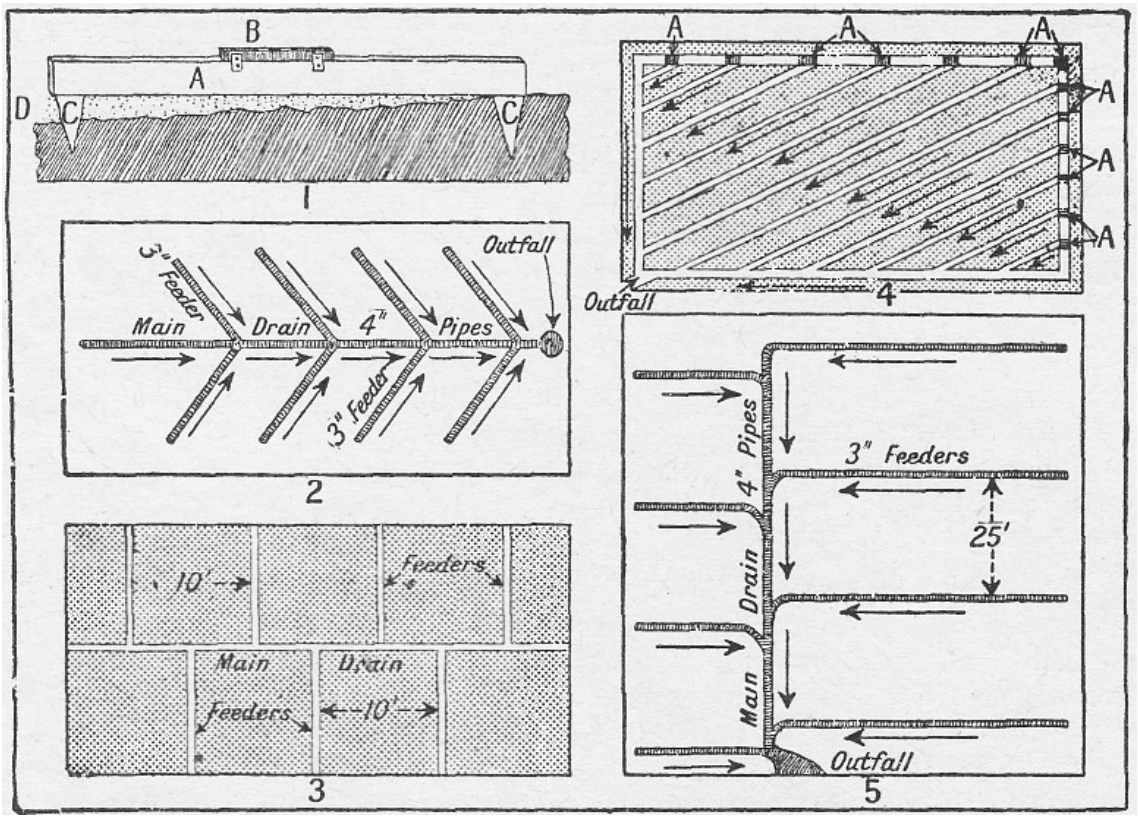
If a lawn is not immediately required, seed-sowing has much to recommend it. Any seed, however, will not suit every kind of soil; a mixture that is excellent for dry, light land may fail on moist loam. Consequently it is advisable to order the seed from one of the reliable seedsmen who specialize in grass mixtures, mentioning the particular class of soil for which it is required. Provided there has been thorough preparation of the plot, and a suitable mixture of grasses obtained, excellent lawns may be secured economically from seed, 3lb. being sufficient for about 30 sq. yd.

The best time for sowing is April or August-September. The soil must be dug over, levelled and made "fine" on the surface. Choose a calm day for sowing, scattering the seed with a swinging motion, first down the plot and then across.

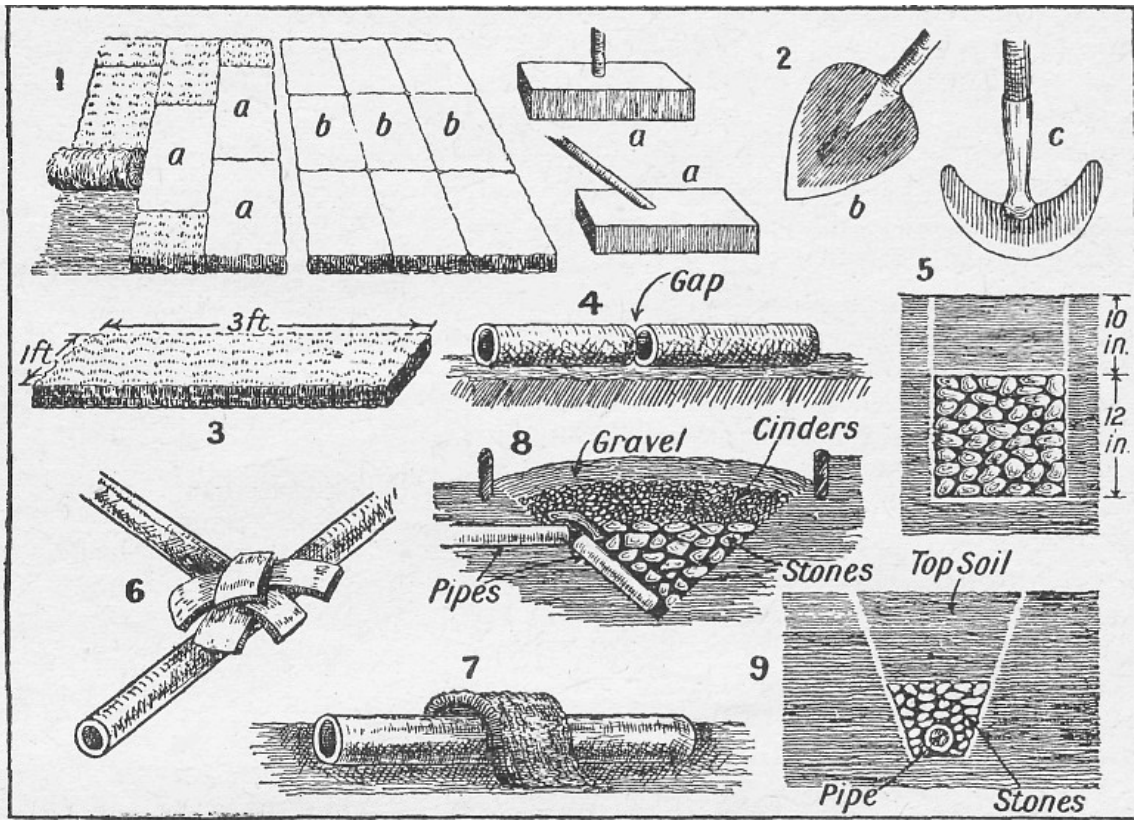
Strands of black cotton should be tied on sticks a few feet apart, as well as with rag flutterers and rattles of tin and glass, to scare away the birds. Cutting should not be attempted until growth has reached a height of 5 in., and then only light topping with a scythe until the roots are strong enough to stand cutting with a mowing-machine.

The most suitable time for laying turves is between autumn and spring, laying them evenly down so that they join lightly together. Fit them in position so that open seams will not occur, and dump them firmly with a wooden beater as pictured in the diagram. This

(Continued in page 1254)



Lawn; draining and levelling. The arrows show slope to outfall. 1. Simple levelling: A, straight-edge board; B, screwed-on spirit level; C, levelling pegs; D, surface levelled. *2*. Herringbone draining by pipes. 3. Draining by trenches. 4. Another method of pipe drainage: A, inlets. 5. Pipe drainage for large spaces.
(By special arrangement with Amateur Gardening)



Lawn. 1. Right (a) and wrong *(b)* turf-laying. 2. Implements: *a*, hand turf beaters; *b*, turfing iron; *c*, edging tool. 3. Ideal turf and its measurements. 4. How to lay pipes. 5. Trench drain in section. 6. How to cover pipe junctions with slats. 7. With turf. 8. Path drain. 9. Best type of drain.

useful implement can be made at home. To keep the lawn at its best, watering must be done freely in dry weather and always in the evening. When a lawn is established and growing vigorously, the mower without its collecting-box may be run lightly over the grass, leaving the slight trimmings as they fall to act as a mulch, and as a protection during hot days. As a rule mowing should be performed when the grass is dry.

Lawn Sand. A preparation of sand and chemicals, known as lawn sand, acts as a destroyer of certain lawn weeds, and as a fertilizer to stimulate the growth of lawn grass itself. Lawn sand may be purchased prepared, but may be made, if desired, by thoroughly mixing ½ lb. of finely pulverized sulphate of iron, 1½ lb. of sulphate of ammonia, and 15 lb. of ordinary sand. It should be applied in spring at 2 oz. per sq. yd. The grass may be discoloured but will recover.

LAWN: The Material. The materials known as lawns are predominantly made in cotton. Sheer lawns are plain white linens with no lint on the surface, bleached in the cloth and made with fine or very fine yarns, in this way resembling handkerchiefs. White lawn is the traditional material for bishops' sleeves. Boiled linen lawns are not so free from fibre on the face of the fabrics. Linen lawn costs considerably more than cotton, wears better and does not soil so quickly. It feels cooler, and is preferred upon that ground for summer underwear.

Cotton lawn is a superior calico about the same fineness as good longcloth. A good quality of raw cotton is taken to make lawn cloths. Cotton lawn is almost always worn white, and it makes up well into underwear and summer frocks.

LAWN MOWERS AND THEIR CARE

Machines Suitable for Large and Small Gardens

The various implements needed by the Gardener are dealt with in this work, among them being Dibber; Fork; Garden Roller; Spade. See further Gardening; Gear.

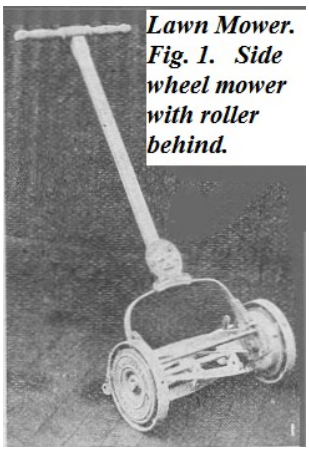
Lawn mowing machines act on the scissors principle, by means of a fixed knife across which blades, set at an angle, revolve as the machine is propelled. The moving blades are fixed together so as to form a cylindrical cuttter, which is caused to revolve on its axis by gearing connecting it to the wheels on which the machine runs. The knife is fixed to the frame of the machine, and the height of the knife above the ground is determined by an adjustment which has the effect of tilting the machine bodily. A gear case is fitted on most types of machine to prevent the teeth of the spur wheels from becoming clogged with grass cuttings, and a detachable box is fixed in front of the machine to catch the cut grass as it flies off the cutter blades.

Back Drum Mowers. There are two main types of lawn mower, one working on the back drum principle, and the other by means of side wheels. The former has a drum of large diameter, extending the full width of the machine, which drives the rotating cutters by toothed wheel gearing, though a chain drive is used in some designs. The cutters and the knife across which they pass are disposed forward of the drum, and a roller is placed in front of all; twin handles are generally fitted. The axle of the cutter is carried in journal bearings at the ends, and these are capable of being raised or lowered by means of screws.

The position of the cutters must be adjusted with these screws, so that as they revolve they just scrape the knife or bottom blade equally all along; if the cutters are slightly too high they will only tear the grass instead of cutting it cleanly, and if too low they will hammer on the knife and blunt both themselves and it. Should the axle be at all slack in its bearings, the half bearings must be taken out and filed carefully on their small flat abutting faces till the slack is just eliminated.

The double spur wheel, which is driven by the drum and drives the cutters, is mounted with its axle in a slot and has a nut to lock it in position. After the cutters have been adjusted into correct relation with the knife, this nut should be slacked off and the axle of the intermediate spur wheel moved in its slot and secured by tightening the nut when it is so placed that it is in mesh with the pinion on the cutter shaft.

Gear wheels must not be engaged so deeply that the tops of the teeth of one wheel reach down to the bottoms of the gaps in the other. The bearings of the drum are designed so that they can be moved a little and re-secured; this adjustment is provided to enable the depth of meshing of the main spur wheel and the intermediate pair to be corrected, but this is seldom necessary. The brackets carrying the roller are arranged to slide up and down in the frame of the machine. This is the means provided for regulating the length to which the grass is cut; the effect of raising the rollers is to tilt the front of the machine down and bring the knife nearer to the ground, so that the grass is cut shorter than if the rollers were lowered.



Lawn Mower. Fig. 1. Side wheel mower with roller behind.

Side Wheel Mowers. The other type of mower is operated by side wheels provided with internal gear teeth meshing with pinions on the cutter shaft; no adjustment of depth of meshing is provided, as none is required. In this class of machine the roller is behind, and its height is adjusted to regulate the length of grass cut as in the back drum design. The adjustment of the blades to scrape the knife, however, is reversed, the knife being the movable member in this case. The knife is mounted so that it can be rocked by slacking one pair of screws and tightening another

pair, the edge being thus brought closer to or farther from the cylinder blades.

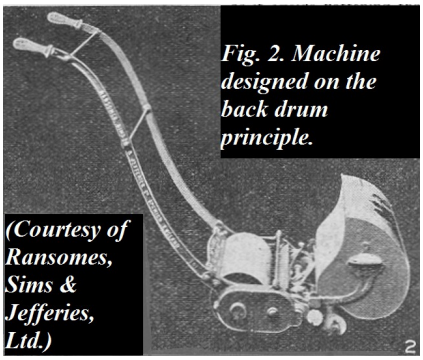
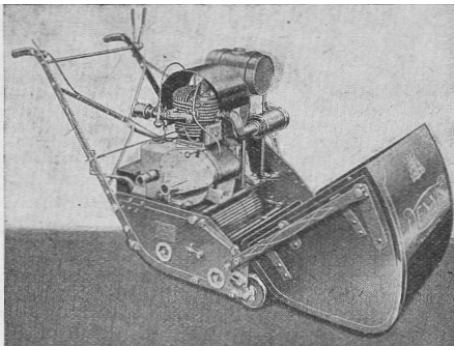


Fig. 2. Machine designed on the back drum principle.

(Courtesy of Ransomes, Sims & Jefferies, Ltd.)

Each of the two main types has its special advantages. The side wheel pattern, owing to the arrangement of its design, is considerably cheaper than the back drum machine and is commonly used for small lawns. The former has the roller placed behind the cutters, which is an advantage for cutting long grass, as it avoids flattening the crop before the blades can reach it. This advantage is, however, considerably discounted by the fact that it is only at the beginning of the season that lawn grass is long, and the ground is then very moist after the winter, under which conditions the wheels give a lot of trouble by skidding and consequently cutting up the ground.



Lawn Mower. Fig. 3. Motor mower with 4½ h.p. four stroke petrol engine. By de-clutching cutting cylinder the machine may be used as a roller. (Courtesy of Dennis Bros., Ltd., Guildford)

The back drum machine, though the more costly and heavier, is free from the skidding trouble, and has the advantage that it will work without any trouble with part of the cutter blades overhanging the edge of the lawn. When cutting at the edge with the side wheel type, on the other hand, a strong twist has to be maintained by the hands so as to prevent tilting sideways, and force the machine to run firmly on the roller and the one wheel that is on the turf. Both patterns are perfectly capable of doing their work and lasting, with fair treatment, for many years.

Sharpening the Knives. Mowing machines are designed to be sharpened by removing the knife and blades and grinding each on appropriate machinery. A less expensive process is to sharpen the cutting parts at home with emery powder without removing them. The machine is turned upside down so that it rests with the handles on the ground and the knife on top, the knife blade being on a slope with its cutting edge lowest. The cutters are adjusted up to scrape the knife, but not so hard as to prevent the mechanism being turned by the palms of the hands pressing on the drum. The cutting edge of the knife is then smeared with a thin paste of fine emery powder moistened with a mixture of oil and paraffin, and the drum is turned by hand to grind the blades.

The grinding paste on the knife must be frequently added to, as it soon gets dull and loses its abrasive power; this can easily be done by putting the new supply on the inclined face of the knife, when it will flow down to the edge. When the grinding process has proceeded so far that the drum becomes easy to turn, the blades should be raised up a trifle so that the action may continue. The sharpening must go on till all the blades rub equally throughout their length on the knife; the sound, as the mechanism is turned very slowly, will be found to be a sufficient guide.

Some machines are arranged so that a handle can be screwed on to the first spur wheel, and this makes the operation less laborious, but it is not essential. Emery powder of suitable grade is on sale as knife polish. Care is needed that a finger does not get caught among the rotating blades. The above refers particularly to the back drum type; side wheel machines are sharpened in an exactly similar manner, except that when turned over the machine must rest on the cross-bar of the handle and on a block placed under the front frame cross-bar, so as to leave the side wheels off the ground and free to revolve.

Useful Hints. Mowing machines require attention to keep them in order. The edges of the blades and knife should be wiped clean after use. The bearings require oiling occasionally. If the mower runs heavy, the meshing of the gears probably needs adjusting. If the blades sometimes fail to revolve when the machine is wheeled forward, the ratchet action must be taken out, scraped clean and oiled.

In the case of back drum machines the ratchet gear, usually fitted in duplicate, is located inside the drum; in the side wheel type the ratchets will be found inside the pinions on the cutter shaft, and can be got at by taking off the side wheels. If the grass is not cut cleanly, or if the blades clog, the cutters must be readjusted to scrape the knife correctly; if this fails, sharpening must be resorted to.

When the machine is put away at the end of the mowing season the bearings and gear teeth should be given a good oiling, and the blades and knife must be wiped clean and dry and well greased; neglect of these precautions will cause rusting serious enough to involve heavy grinding to get the blades sharp in the spring. Stones on a lawn are apt to blunt the blades, or even chip them; the only safeguard is to keep a sharp look-out, especially where the grass is alongside a path.

LAWN TENNIS ON GRASS AND HARD COURTS
Hints on Playing this Popular Outdoor Game

This work contains articles on the outdoor games that are played in and about the home, such including Badminton; Bowls; Croquet. See also Lawn.

There are two forms of lawn tennis, singles and doubles. In singles two players are pitted against each other; in doubles four take part, two against two. It is also possible for one person to play two others. The game is as suitable for women as it is for men, and mixed doubles, as they are called, are very popular.

The game is played on a court, usually of grass, but often of gravel, asphalt, sand, cement or some other hard substance. The former kind is the most popular, but the latter, which is coming more and more into favour, has the advantage that it can be used in winter and almost at once after a spell of wet weather; in such conditions grass courts are unsuitable for play. In general the game is faster when played on a hard court.

Balls, Racquets and Net. The implements required are a net to divide the court, a racquet for each player and a number of balls. Each player provides his own racquet, choosing one that suits him or her. The main considerations in making this choice are weight, balance, the size and feel of the handle, and the thickness and tautness of the gut. As regards weight, a man's racquet will weigh about 14 or 15 oz. For most men a light one, say 14 oz., will be quite heavy enough, but others will prefer a heavier one. Women should not use a racquet weighing more than 13½ oz., while one of 13 oz. is probably heavy enough for the majority. The rules of the game place no restrictions upon the size and weight of the racquet.

To test the balance of the racquet the following method is suggested. Place the racquet on the first finger just about where the screw passes through its neck. The racquet will then either sink at the handle or the head end, or will remain balanced. One that will remain balanced is the most suitable for an ordinary player.

If, however, a player wishes to concentrate on driving from the back of the court, a racquet that sinks at the head should be chosen. If, on the other hand, a player wishes to devote himself to volleying, one that sinks at the handle is advised. As regards the handle, a fairly thin one is usually preferred. For a woman this should not exceed 4¾ in. when measured below the leather, and it need be no more than 4 ⅝ in. For a man it must be somewhat thicker. The handle should be fairly rough; if it gets smooth and slippery it is a good plan to rough it with a file.

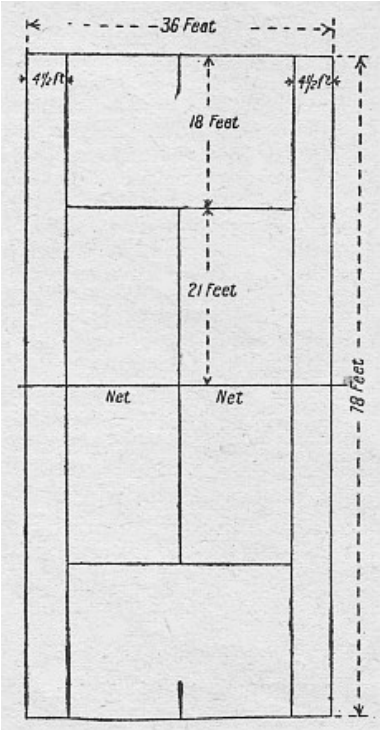
Some players like a rubber covering for the handle, and in some cases this certainly prevents slipping. Persons with moist hands should, however, avoid these grips. Other grips which they may use are made of adhesive surgical wrapping. If a grip is used it should on no account be more than 6 in. long.

Gut for racquets is either thick, medium, or thin, the medium being best. It is important that a racquet should be tightly strung. This can be tested by nicking the nails across it, when a good one will give forth a musical sound. In addition to these points the buyer of a racquet should take it firmly in the hands and see how it feels in the grip when swung. If it is not absolutely comfortable and easy, it should not be bought, however good a racquet it may be. A racquet should be kept in a press when not in use.

After the Great War a new kind of racquet was introduced, aluminium wire taking the place of gut. For a time this was popular, but after a trial many players abandoned it and reverted to those made of gut.

The balls are of rubber, covered with flannel or cloth. The rules of the game order that a tennis ball-shall not be less than 2½ in., nor more than 2⅝ in. in diameter, and shall weigh between 2 and 2 1/16 oz. The court, whether hard or grass, shall be a rectangle 78 ft. long. For the singles game it shall be 27 ft. wide, and for the doubles game 36. These measurements are shown by white lines marked on the grass or gravel. It is customary to mark out a court for the double game, and if a single is played to regard the 4½ ft., which is marked on either side, as outside the area of play.

By the rules, the court must be divided across the middle by a net suspended from a cord, the ends of which shall be attached to, or pass over, the tops of two posts, 3½ ft. high, that shall stand 3 ft. outside the court on either side. The height of the net shall be 3 ft. at the centre, where it shall be held down taut by a strap not more than 2 in. wide. There shall be a band covering the cord and the top of the net, not less than 2 in., nor more than 2½ in. in depth on each side.



Lawn Tennis. Diagram of the court marked for both singles and doubles. For the former its width is only 27 ft., the side boundaries being the inner of the two lines shown.

How to Play the Game. The aim of a tennis player is to drive or place the ball over the net into the op-ponent's court, in such a way that the opponent, or opponents, cannot return it, or, if they can, they return it wildly, and therefore send it out of play. Each game is opened by a service, the player serving, each through-out a game, in turn. Serving consists in landing the ball in what is known as the service court, behind which one of the server's opponents stands ready to take it. The server himself stands just behind the back line. If he fails to land it correctly at the first attempt he is allowed a second; but if he fails in this service also, his opponent scores a point.

As soon as a correct service has been delivered the ball is in play and any player can hit it. A hit is correct if the ball is either volleyed or taken on the first bounce, provided that it lands across the net and within the court. The players return it from one to another as often as they can, this being known as a rally. When one side fails to return it correctly, the other side scores a point. The score is called at the end of each point, that of the serving side being put first. Thus 40-15 means that the serving side has scored 40 and the opponents 15, while 15-40 means the reverse. If the two sides are equal, the score is called with the word all added.

Method of Scoring. The score is reckoned thus: 15, 30, 40, and game. A game can, therefore, be ended after four rallies, or even by four strokes. If, however, both sides reach 40—deuce, as it is called—one side must win two points in succession before a game is secured. This is done by a system of advantages, or vantages.

The score that immediately follows deuce is either vantage-in or vantage-out, the former if the server wins it, the latter if his opponent does so. If the side that won the vantage wins the next point, the game is theirs; but if the other side wins, the score reverts to deuce and play goes on. As, therefore, a game can theoretically go on for ever, and as in actual fact games do last for a considerable time, the players in friendly games sometimes agree to decide a game by the issue of a single point.

A set, which is the unit generally played in lawn tennis, consists of six games. Here, again, there is an arrangement similar to that for the advantages in a game. If the combatants reach five all, a set must continue until one side is two games in front of its opponents. Thus a set may go to 6 all, 7 all, 8 all, and only end when 10 or perhaps more games have been played, with a score of 10-8 or 11-9. Players usually toss as to which side of the court they shall play. The one who wins, chooses, and the other side takes the first serve. It is customary to change from one side to the other at the end of each odd game, i.e. 1, 3, 5, etc. This applies to both singles and doubles.

Such is the game in brief outline, but fuller particulars can be obtained by reference to the laws drawn up by the Lawn Tennis Association and accepted by lawn tennis players everywhere.

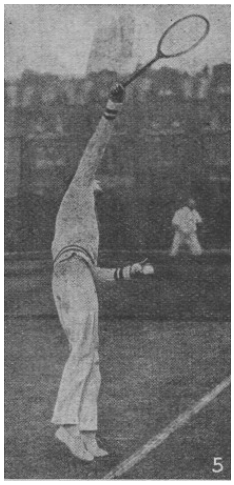
Advice on the Game. To be proficient in the game a lawn tennis player needs the quickness of eye, hand and foot that is essential to success in most ball games, a knowledge of the various strokes and constant practice. Primary rules are that he should keep his eye fixed on the ball, and by correct footwork should make the best use of the weight of the body. He should remember that the amount of pace imparted to a stroke depends upon the speed of the racquet when it meets the ball.

One authority lays it down that every stroke in lawn tennis can be divided into three separate and distinct actions, which should, however, in practice be blended harmoniously into one movement. The first is the swing back of the racquet; the second is its swing forward and its hitting of the ball; and the third is the end of the swing after the ball has been hit, the follow-through, as it is called. The third, far from being unnecessary, controls the balance of the player's body. To some extent the play of men differs from that of women, but this distinction does not affect the main principles of the game.

The lawn tennis player must first of all learn how to serve. The service most favoured today, largely as the result of the example of American and Australian players, is the high overarm one, delivered at a very rapid pace and usually made additionally difficult to take by the spin that is put on the ball. The first service is usually delivered at the utmost possible speed; the second, if such is necessary, only a little less fast.







Lawn Tennis.
Overarm service. Fig. 3. Beginning the serve, racquet being shown at its lowest point.
Fig. 4. Raising racquet and tightening grip.
Fig. 5. Position of racquet after ball has been hit, showing full extent of reach.

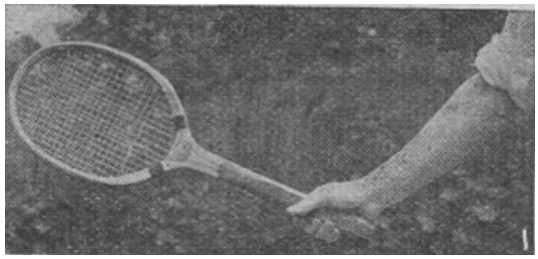
This high overarm service is used by most men players and by the best women players. Figs. 3, 4, and 5 show a great player in the act of delivering it, which he does by hitting the ball with the racquet at the full stretch of his arm, thus getting the greatest possible power on to it, and then letting his racquet follow the ball right through the stroke until it comes to rest near the right leg. The ball should be thrown up over the right ear and struck the second it comes within reach of the centre of the racquet.

When beginning the serve, the weight of the body will be on the right foot, but when the ball is hit, it should be transferred to the left. To impart the necessary spin, he draws his racquet across the ball at the moment of impact. This service can usually be acquired by men of ordinary agility and strength, provided they practise. They should not hesitate to throw the ball up to a good height when serving; many serves are quite spoiled because this is not done, and

therefore the ball cannot be hit with the racquet at the player's utmost reach and power.

To receive a service of this kind the player should stand well behind the back line, diagonally to the server. He should watch carefully for the break of the ball, and, if it has this quality, should meet it so that it breaks towards his hitting arm, not across his body. It should be hit hard, preferably with a little top spin, as this will kill the spin the ball already possesses. The return strokes generally used are the drive across the court and the one down the side line. If these strokes are made with the forehand drive and a spin is put on the ball they are very difficult to return.

The Chief Strokes. It is fairly generally agreed that there are five strokes, apart from the service, that are of major importance, the others being variations of one or other of these. The five are the forehand and backhand drive, the smash, the volley and the lob.



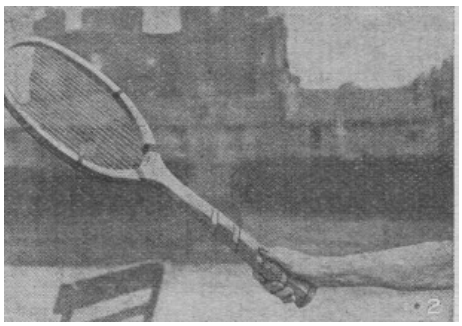


Fig. 1. Correct method of gripping the racquet for forehand drive. Fig. 2. Grip of the racquet at finish of back hand stroke, showing position of thumb during whole of stroke.

The way in which the racquet should be held for the forehand drive, perhaps the most used of all the tennis strokes by good players, is shown in Fig. 1. The handle should be grasped so that it lies diagonally along the hand, not straight across the palm, and rather in a straight line with the forearm than at right angles to it. The head of the racquet, as a general rule, should be parallel with the ground. It is well for the player to separate the forefinger from the other fingers, as he will get a firmer and more comfortable grip. The thumb should lie across the handle, not tightly round it.

There are several varieties of the forehand drive, the names, such as the chop drive, the cut drive, and others, given to them suggesting slight variations in the way the ball is hit. One that is most practised is the horizontal drive. In this the ball is hit either with the racquet at right angles to the ground, i.e. without spin or cut, or hit with a racquet that moves upwards a little and turns over after the ball has been hit, thus giving what is called top spin to the ball.



Fig. 6. Forehand drive. Beginning the stroke, the player being sideways to the ball.

To make this drive successfully it is necessary to have the body in a correct position. The player should stand sideways to the net with the left foot in front of the right, the feet being parallel to the base line and about 15 or 18 in. apart, according to his height. The reason for this position is that without it the player cannot swing his racquet freely, cannot use his weight properly, and cannot keep his eyes so easily on the ball.

The drive should be made with the arm straight or almost so and the ball taken as high as possible consistent with the horizontal position of the racquet and when it is at a point about the middle of the player's body. In this way racquet and arm, moving together in one long, straight sweep, put the greatest possible power into the stroke, the analogy being that of a straight stick, by which a harder blow can be struck than with a crooked one. A common fault is to get too near the ball, which cannot then be hit as strongly or as accurately.

Equally important is the correct use of the weight of the body. This should remain, as far as possible, on the right foot until the stroke is half completed, when the player should begin to transfer it to the left one. It should be entirely on the left or front foot as the stroke is finished and the player swings the racquet round for the follow through. The right or back foot should never be lifted from the ground before the ball has been hit. It is understood that these instructions refer to persons who hold the racquet with the right hand; for left-handed players the position of the feet must be reversed.

For the backhand stroke the racquet should be gripped in a somewhat different manner, the correct method of doing this being shown in Fig. 2. It should be grasped so that the handle lies diagonally across the hand. It is held in position by the thumb, which presses it against the fingers and the palm of the hand. Greater flexibility of wrist is secured by allowing the forefinger to be separated slightly from the others. The thumb may be placed across the handle or may lie along it. The wrist is more flexible if the thumb lies along the handle, but the alternative way of holding it makes for a stronger grip.

When making the backhand stroke the player should be in the same position as for the forehand stroke, i.e. the body in a position sideways to the net with the feet parallel to it and apart. He should remember that, more even than other strokes, the backhand drive depends for its success upon correct footwork, i.e. the use of the feet and transferring the weight while the

stroke is being made. The racquet should be swung both backwards and forwards parallel with the ground, and the ball should be hit as far away as possible from the body, provided that there is no loss of balance. The ideal place to hit it is at a point a little below the line of the waist, that is, lower than that taken for the forehand stroke.

When he begins this stroke the player should have his weight upon the back foot, from which it should be transferred to the front one as the racquet comes forward and makes the hit, and it should be wholly upon the front foot as the drive is completed. It will be of assistance to the follow through if he lifts his left foot from the ground as soon as the stroke is made. The wrist should be quite rigid when the ball is struck.

In playing this stroke good players make use of the left shoulder. By means of this the body is turned as the stroke is made, and the rotary movement thus given helps the swing and power of the drive. If a player is unable to play this stroke with a horizontal racquet at right angles to the ground, or wants a variation from it, he can play it with the racquet slanted back somewhat. This will then pass under the ball, and so give back spin to it, thus causing it to hang a little after pitching.

The Smash Stroke

The smash stroke is played with very much the same action as the serve, and players who are good at the latter are usually good at the former. As this stroke depends for its success very largely on power, the harder the ball is hit the better. In some cases a ball hit in this way can hardly fail to score.

To play the smash well a player must get into the correct position, and with the arm stretched to its fullest extent must bring the racquet down with its utmost force just as the ball is on the middle of it. The stroke must not be hurried, and the weight should be transferred from the back to the front as it is finished. If the right position has been taken up, this movement enables the full weight of the body to be put into the hit. If this cannot be done the player has probably misjudged his position.

In addition to this, the usual form of the smash stroke, there is a backhand smash that can sometimes be used to good purpose. To make it the racquet should be held with the backhand grip, with the thumb along the handle to give control. It should be made with the forearm, the ball being taken above the left side of the head and hit with a sweeping action round it. As with the ordinary backhand stroke, the player should have his body sideways to the net and his feet parallel to it and apart. The wrist should be rigid as racquet and ball meet.

Volleying. Volleying, which means hitting the ball before it has touched the ground, is one of the most effective of lawn tennis strokes. It should only be attempted when the player is quite near the net and in position to dash the ball down at great speed. In this stroke the wrist plays the dominating part, little or nothing depending upon the weight or swing of the body and the sweep of the racquet. The wrist must be as firm as possible and the racquet held in a strong grip. If this is not done the racquet will turn in the hand and the stroke will consequently be a failure. The volley derives its power from the pushing action of forearm and wrist and its speed from the pace of the ball when it meets the racquet. Accuracy of aim is secured by keeping the head of the racquet supported above the wrist.

To make a volley it is not necessary for the player to put himself into a position sideways to the net, as he should do for a drive, although this position is recommended by some authorities, who assert that a harder return is thus secured. Most players volley facing the net with the feet more or less parallel to the side lines. One reason for this is that there is less time to prepare for the volley than for the drive.

There are several forms of the volley. A forehand volley is made with the racquet held in the forehand position. The ball should be hit about the height of the shoulder, and the head of the racquet kept a little above the horizontal, with the wrist pressed down. A variety of this stroke is necessary when the ball drops below the height of the net. The danger of driving it into the net can be avoided by stooping down and keeping the head of the racquet up, so that the ball is hit slightly upwards and clears the net.

Volleys, like other strokes, must be placed if they are to score. This is done by turning the wrist one way or the other. For instance, if a player is near the net in the centre of the court, and he wishes to volley to the left of his opponent, who is almost facing him, he must turn his wrist out, i.e. away from the body, and slant his racquet in that same direction. The ball will then be volleyed to the right, which is the opponent's left.

The volley is sometimes made with a backhand stroke. For this the grip should be shortened and the thumb placed down the back of the handle. The player should take up a position sideways to the net, and should stoop down so that the head of the racquet is about the height of the waist. As for all other volley shots, the racquet must be held tightly and the feet planted firmly on the ground. It is not necessary, however, to swing the racquet for this stroke.

Use of the Stop Volley

Very useful on certain occasions is the stroke known as the stop volley. If properly delivered it makes the ball drop just over the net, and, is, therefore, often played when an opponent is at the back of the court. It can be made in two ways. One is to hold the racquet loosely at the moment of hitting the ball, and the other and better way is to slant it, thus giving the ball the necessary spin.

The same purpose, i.e. placing the ball just over the net when the opponent is well away from it, is fulfilled by the drop shot. To play it the ball must be hit crossways, the racquet being almost parallel with the ground. It hits the ball underneath from right to left in order to put on it the spin which will prevent it from bouncing far when it drops over the net. This stroke is

made with the wrist and arm. The player does not put any of his weight into it, neither does he swing the racquet for it nor follow it through, as he does with most other lawn tennis strokes.

The stroke known as the half-volley is worthy of attention, although it should only be played in an emergency. It is something between a volley and a ground shot, and is useful when the ball comes in such a way that the player can neither volley it nor drive it. It should be played with the racquet quite firmly held and in as horizontal a position as possible, the ball being hit as soon as can be after pitching. It differs from volley shots inasmuch as the racquet should be swung to the ball and should follow it through as far as possible.

The Lob. The last of the five main strokes is the lob. In this the player lifts the ball over the head of an opponent so that it pitches just inside the base lines, or at least in the back part of the court. It is a very easy stroke to play, though it cannot be played with the necessary accuracy without a good deal of practice.

In order to play a lob properly the player must be in a sideways position, just as for the forehand drive. The racquet should be slanted back and be swung from underneath in a firm grip. Care must be taken to lift the ball high over the opponent's head otherwise it will be smashed back. The lob can also be delivered with a backhand stroke, and it can be made with spin on the ball. Its prime essential, however, is accuracy, as inaccuracy cannot in this case be compensated for by pace, as it can with the drive.

These and other lawn tennis strokes are played in the same way for singles as for doubles. In singles the player's task is quite simple; he must himself return every stroke to the utmost of his power, but in doubles the two players must have an understanding on the subject; otherwise confusion and loss of points will be the result.

Tactics for Doubles. In men's doubles the tactics of the best players are as follows. The server, having delivered his service, dashes up to the net, where his partner is already stationed. Each in his own half of the court, they will then be in a position to smash or volley a large proportion of the returns. They must be prepared to run back if a lob is threatened, each watching his own side of the court; but otherwise the nearer the net the better is quite a good rule. Players in this position should always be moving, or appearing to move, towards the centre of the court, in order to cut off an opponent's return and also to keep him in a state of uncertainty.

When it is the turn of a player to receive a service, he and his partner should both be on or behind the base line, the best players having abandoned the idea of having the one not receiving the service at the net. When a return justifies it they should go forward together, keeping in line and the same distance from each other, so that they will cover as much of the court as possible. One authority suggests that the striker-out should occasionally send a drive straight at his opponent at the net, as a stroke of this kind, if delivered about waist-high, is usually very difficult to return, either forehand or backhand.

In mixed doubles different tactics are desirable. The accepted formation is for the man, when not serving, to be at the net and his partner on or near the base line, the best position for most women players being a little outside the line and not far from the corner of the court. In this position the woman player can make two effective shots, the drive across the court and the drive down the side line. When the man is serving, he dashes up to the net as soon as he has delivered his service.

In most cases this formation is doubtless the best, but there are exceptions. For instance, if the lady is a good volleyer it may be advisable for her to play the same game as a man would do; but if she is not, her partner, being at the net, should hit on the volley everything that comes within his reach.

Handicapping. In lawn tennis tournaments, and sometimes in friendly games, players are handicapped. This is carried out by giving strokes to the weaker players, and making the stronger ones owe strokes. For instance, a player may receive 15 points, or 30 or 40. This means that he has one, two or three strokes in hand when the game begins. If, on the other hand, a player owes 15, 30, or 40 points it means that he must win one, two, or three strokes before he can begin to count, 15, 30, and so forth. Thus, if a player owing 30 plays one who receives 15, the latter only requires three strokes to win, unless deuce is reached; the former requires six.

The more usual way, however, of handicapping is to give, or receive strokes represented by sixths of 15. These odds are received in each group of six games of a set; in the first place in the earliest possible even games. That is to say, a player who receives one-sixth of 15 receives a stroke in the second game of each group of six; a player who receives two-sixths receives a stroke in each of the second and fourth games, and a player who receives three-sixths receives a stroke in the second, fourth and sixth games.

LAX: Of Smoked Salmon. A special preparation of smoked salmon, lax may be served as hors d'oeuvres, being cut into thin slices, covered with dressing and garnished with parsley or chopped pickle. Lax is also served as a savoury on small buttered biscuits. It should be freed from the oil in which it is preserved, moistened with salad oil and lemon juice and then seasoned with pepper. It should be allowed to stand for some little time so that the oil, etc., may soak in. Parsley may be used as a garnish. *See* Hors d' Oeuvres; Salmon.

LAXATIVE. The mildest cathartic or opening medicines are known as laxatives or aperients. The principal laxatives are cascara sagrada, sulphur, euonymin, manna, magnesia (magnesium oxide), castor oil, olive oil, and liquid paraffin. Many fruits have a

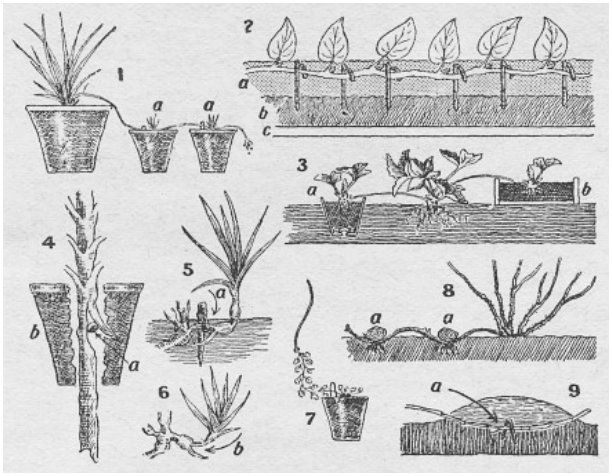
laxative effect, particularly stewed prunes, figs and tamarinds. *See* Aperient.

LAXTONBERRY. This is a new berried fruit raised by cross-breeding between the raspberry and the loganberry; it needs the same treatment as the latter. As the flowers are partly self-sterile the laxtonberry should be planted near other berried fruits.

LAYERING. This is a method of increasing stock of carnations, roses, and other shrubs and plants. The idea is to prevent the return of the sap from the extremities of the leaves and branches to the roots by means of a cut in the stem. The sap bleeds, the wound hardens, throws out roots, and eventually the branch becomes a separate plant.

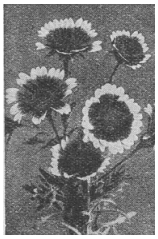
To take a layer, a suitable low-lying branch or shoot must be chosen, and all the leaves stripped off below a selected joint. The joint is sliced half-way through with a sharp knife, at a very acute angle. The partially severed branch is bent upward and pegged firmly down into the ground in a patch of very sandy soil.

Pegs, in the shape of inverted V's, are pressed down, with one leg on either side of the layer, in order to keep it in position. Hairpins may be used for layering carnations. Summer is the best time for layering. *See* Carnation; Rose.



Layering Methods. 1. Layering stolons of St. Bernard's Lily. 2. Multiple layering of Lapagerias: a, soil; b, fibre; c, staging. 3. Strawberries layered into (a) plunged pot and (b) box. 4. Stem-layering: a, pebble in tongue; b, halved flower pot. 5. Carnation cut and pegged (a). 6. Carnation cut wrongly (b). 7. Method of layering certain fern plantlets. 8. Layering loganberry shoots: a stones. 9. Clematis layered: a, slit stem behind joint.

LAYIA. The only species of layia generally offered is elegans, an annual with downy leaves and yellow flowers in summer, growing about 12 in. high. It is sown outdoors in April. There is a white-flowering variety.



Layia. Yellow blooms of the annual variety elegans.

LEAD: Its Uses. Lead, which is one of the heaviest and softest of metals, has many uses in the home. In the form of pipes it is extensively used in sanitary systems, for waste pipes, and occasionally for hot and cold water services. In sheets, lead is used in the construction of gutters and for covering flat roof surfaces, the lining of sinks, and in numerous other directions. It is not much affected by the weather, and does not rust or corrode under the action of water.

Lead can be soldered, or joints formed by burning, this process consisting in melting the lead at the joints so that it fuses or burns together. Lead is often used for decorative purposes in the form of garden ornaments, rain-water heads and pipes, and in some forms of ornamental statues, generally those used as a centre ornament for a fountain.

In the home lead is used for keeping carpets in place at the edges, or for weighting the bottom of a table-lamp stand or other structure. It has the advantage of occupying less space for its weight than any other convenient metal.

Poisoning by Lead. The presence of lead in water or food may lead to poisoning, but it is most commonly found amongst persons whose work involves the use of lead, such as, for example, plumbers, painters, and potters. The symptoms are sickness, acute pains and diarrhoea. While awaiting the doctor induce vomiting by tickling the back of the throat or by an emetic. If it is at hand a dessertspoonful of Epsom salts should then be given, followed by milk and white of eggs. A hot poultice on the abdomen will help to relieve the pain.

In chronic lead poisoning the first symptoms may not appear for months, the most prominent being colic, with agonizing pains in the region of the navel. There is a blue line along the gums at the junction of the teeth, also anaemia and muscular weakness. Thorough medical treatment is required. *See* Casting; Flashing; Gutter; Plumbing; Sink.

LEAD ARSENATE. This is a poisonous and dangerous compound, which may be purchased in paste form in jars for mixing with water in the proportion of ½ lb. of paste to 10 gallons of water. It consists of a combination of acetate of lead and arsenate of soda, and special precautions must be taken in its use, the maker's instructions being strictly followed.

The wash is valuable for clearing fruit trees from the larvae of such pests as the codlin, vapourer, winter, lackey, and currant moths, gooseberry slugworm and sawfly, and also caterpillars and biting beetles. *See* Fruit; Lackey Moth; Spraying, etc.

LEAD ART CRAFT FOR HOME DECORATION
How to Make Inexpensive Leaded Windows and Mirror Frames

This article deals with the various forms of ornamentation possible by means of prepared lead

strips. The entry on Leaded Lights and that on Stained Glass should be consulted. See also Name Plate.

Many people like the appearance of leaded lights for their homes, but are deterred from installing them owing to their cost. By the use of prepared lead, obtainable in coils, a special cement, brush and sponge, the amateur can for a trifling sum convert a plain window into one with leaded panes.

This lead is manufactured in thin strip form and in various widths. It is extremely pliable, easy to use, and is coiled to facilitate handling and for convenient packing. A particular feature of the lead is that it adheres to tiled surfaces, metal, wood, or glass. It can be used for framing pictures or mirrors, and is one of the easiest materials for applying with cement as a moulding. It can be painted with cellulose quick-drying paint when employed to outline tiled surfaces in a bathroom or kitchen.

Designs for decorating glass screens, glazed doors for wall cupboards, bookcases or overmantels, can all be carried out by the amateur, while the lead can also be employed for name plates on front doors and gates. The cement to be used with the coils of lead is specially prepared to withstand all weathers. Various outfits are obtainable for this craft, including one which contains glass colour stains for use on windows, etc., in ruby, amber, blue, and green.

Simple Leaded Windows. A small window on the staircase or landing may be selected on which to experiment. It will be found that after applying this form of decoration the window is quite easy to clean. The strips do not work up, however much they are rubbed, if the special cement is used for fixing them on to the single panes of the ordinary window.

The first task will be to measure off the correct length of lead. Hold an end of the lead in one hand at the top of the window and allow the coil to unwind and fall perpendicularly (Fig. 1). Then nick the lead at the desired point with the thumb nail and, taking it from the window, snip it off at that mark.

Measure off and cut all the lengths for one window before proceeding any farther; then take the brush and the tin of liquid cement and paint each strip of lead on one side only with a thin but even coating of cement (Fig. 2). Treat two or three strips of lead in this way before attempting to affix any to the window, as the cement must be on the lead for fifteen minutes before applying. This will ensure that the cement has partially dried and is slightly "tacky," and therefore more adhesive. Pencil-mark the window frame to ensure the strips being laid on straight. Now take the strip of lead which was cemented first and lay it against the glass in the position required.

Having made sure that it is exactly straight, press it firmly and evenly with the ball of the thumb (Fig. 3), and with a linen rag damped with petrol or turpentine gently sponge away any cement which has been pressed out from under the lead on to the glass. It has been found better to start with the horizontal strips, but leaving the top and bottom horizontals until last. They will serve to frame the others and keep them in position. Many people leave the spare cement on the edges of the lead, preferring the appearance of age which the resulting irregularity affords. The strips may be applied to both sides of the window, as the cement stands all weathers.

Similarly, opinion is divided upon the question of overlapping. Some prefer to overlap the strips of lead, for this method is easier and quite attractive. Others prefer to cut each section flush with the next, giving a soldered-joint effect (Fig. 4). Mistakes are easily rectified. If a strip of lead is applied incorrectly turn up the edge with the point of a knife and the whole strip can then be pulled off quite easily. After experimenting with a squared pane effect, diamond panes (Fig. 7) will be found equally easy to simulate.

To imitate the Gothic or Norman arch, as seen in Fig. 8, or to insert panels of heraldic designs, etc., the amateur must learn how to bend the lead. Hold the strip so that the side which is to become the outer-edge of the curve is uppermost, and gently pull the lead round to the desired curve, doing a little piece at a time (Fig. 5). The lead is now neatly curved on the outer edge, but the inner edge is buckled. Proceed, therefore, as follows: Lay the curved strip on a flat surface. Hold firmly in position with finger and thumb of one hand and gently press the buckled surface with the ball of the finger (Fig. 6). Practically all the buckling will then disappear, and by gentle rubbing with the finger, which should be protected by the corner of a linen rag, a completely flat appearance will be ensured.

For making a number of curves of the same size it is easier to work with a template. This is a thin piece of cardboard which is cut to the exact curve required. Tack this template on to a smooth piece of wood. Next tack the metal strip to be curved just above the top of the template; then gradually ease the lead round the edge of the template with the fingers by means of a gentle pulling and pressing movement.

Glazed bookcases can be treated in the same way as windows. Books appear attractive behind leaded panes, and so do china and glass. Recessed cupboards on landings or in halls often look well if the upper portion is glazed and decorated in this way. Fig. 9 shows a simple design for a bookcase or cupboard. Coloured glass effects may be introduced by means of the specially prepared stains, but requires discreet usage.

The possibilities of lead strips for framing pictures and mirrors are well worth noting. By this means a permanent frame is procured with little more trouble than the temporary one made with passe-partout paper. A groove in the particular form of strip sold for framing purposes allows the lead to be bent on to the back of the picture or mirror mount. Figs. 10, 11 show this simple process, while in Fig. 12 may be seen the artistic effect of a perfectly plain mirror framed in lead.

Designs may be heavily drawn in pencil and placed under glass to be outlined in lead for ornamenting

(Continued in page 1264)

LEAD ART CRAFT.

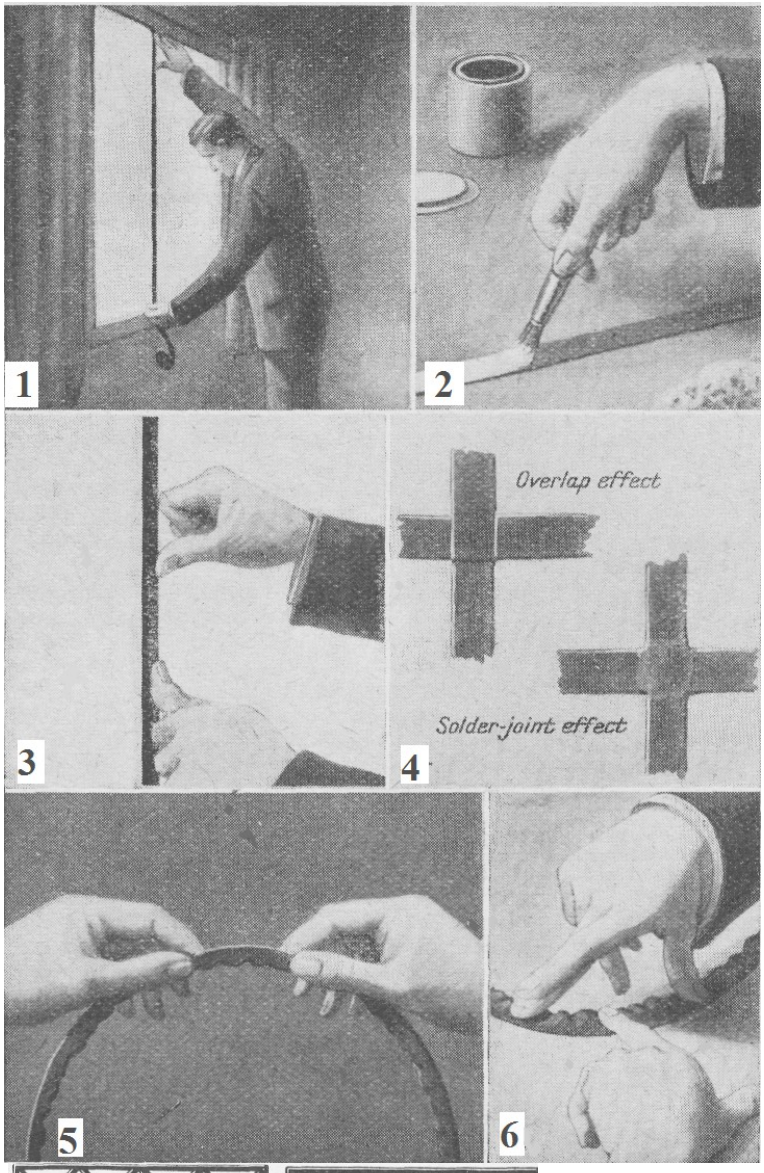


Fig. 1. Measuring length of lead required.

Fig. 2. Coating strip with cement.

Fig. 3. Applying strip to glass.

Fig. 4. Two forms of joint.

Fig. 5. How to bend strip lead.

Fig. 6. Smoothing inner buckled edge.

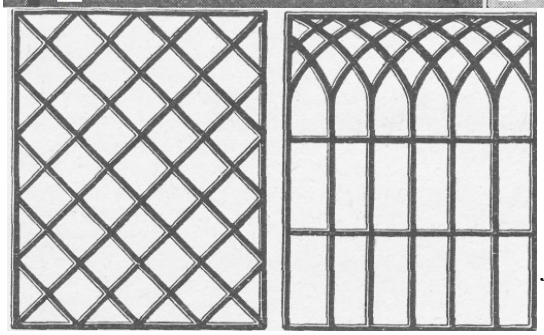


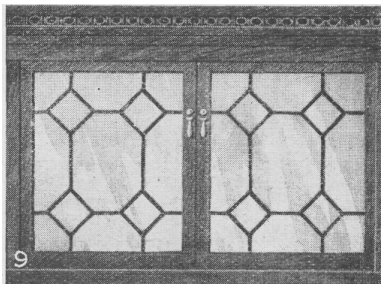
Fig. 7. Diamond pane effect.

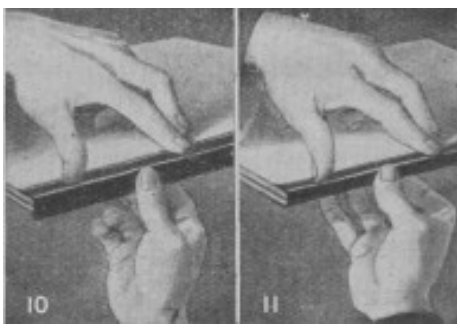
Fig. 8. Imitation of Gothic arch.

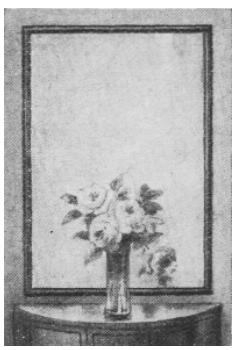
Fig. 9. Design for bookcase or cupboard.

Figs. 10 and 11. Two stages in the use of grooved lead strips for framing purposes.

Fig. 12. Good effect of a plain mirror framed in lead.







panels for screens or other articles. A special form of very narrow lead strip is sold for the purpose of outlining such designs.

House Name Plate. One of the most effective uses to which lead strips can be put is to make the lettering and framing for house name plates. Under a rectangular piece of glass of the size required for the plate, the name, having been written or printed in one of the various types of lettering suitable for this purpose, is placed and the letters are double outlined with the narrowest width of lead strip obtainable. The lead must be slowly eased along, the forms of the letters showing through the glass, and one end must be steadied with the left hand so that the forms already made will not be pulled out of shape. The worker must not proceed too fast if the letters run on, or the first letters of the name will not have a chance to adhere properly.

Metallic paint may be applied on the back of the glass, so that the letters appear golden in the centre and outlined with lead. Another piece of glass of the same size and shape as the first piece is then laid over the leaded letters, so that they are protected on either side by glass. To provide for safe suspension of the plate two thin pieces of brass are each eyeleted at one end and slit at the other, so that the slit ends can be bent up, one to the front and the other to the back, to form resting places for the two pieces of glass. Having placed these on the upturned ends of both pieces of brass, bind together with strips of the passe-partout width of the lead, thus binding in the brass with the bottom of the plate and leaving the two eyeleted ends projecting at the top, where this is in turn bound with the passe-partout. In order to avoid the danger of moisture condensing between the two pieces of glass, the under edge of the passe-partout framing should be pierced in several places to provide ventilation. The lead strips are obtainable in widths of from ¼ in. to ¾ in. Stranded leads are used for fine out-lining.

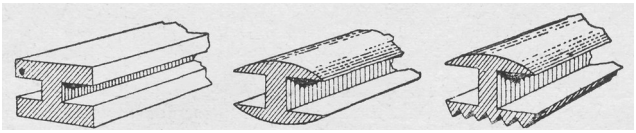
LEADED LIGHTS FOR THE HOME

All Old-World Attraction for the Modern Home

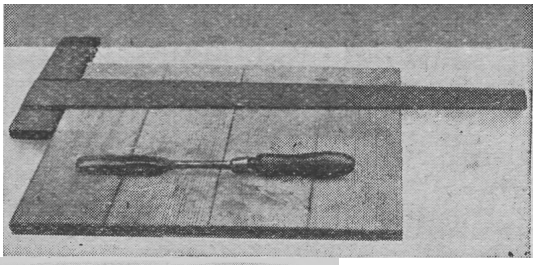
Other articles that deal with the decoration of the home are Enamel; Paint; Panelling; Parquet. See also such entries as Casement; Glass; Stained Glass; Window and those on the materials and processes, e.g. Cement; Soldering

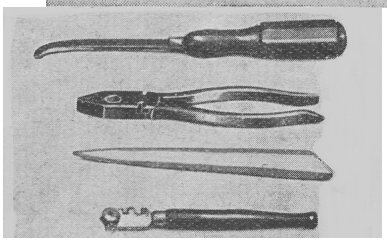
The old form of decoration known as leaded light work consists in the use of pieces of glass to form a pattern, in which they are held together by cames, or strips of lead. These are soldered together at the joints, and the whole fixed in a framework. Leaded lights form a pleasing feature of some styles of decoration, particularly in houses furnished on the Tudor or Jacobean models. In many cases it is possible for the amateur to take out existing casement windows and replace them with leaded light panels, or add lead panels to the framework.

The amateur worker is recommended to study the article on Glass and Glazing. The tools required for making leaded lights are one or two good glass-cutters, either a diamond or one of the newer types of wheel cutter. On a rippled or variegated surface it is probable that a better result will be obtained from the use of the wheel, but in large sheets the diamond is less likely to cause a breakage, as it requires less pressure to effect the cut. A board upon which to cut the glass, a T-square and set-square, and straightedge are required, as well as one or two knives for cutting the lead, a pair of pliers, and soldering iron.



Leaded Lights. Fig. 1. Diagrams showing three varieties of lead cames employed in this decorative work.





Leaded Lights. Fig. 2. Above, catting board, T-square and soldering iron; below, other special tools required.

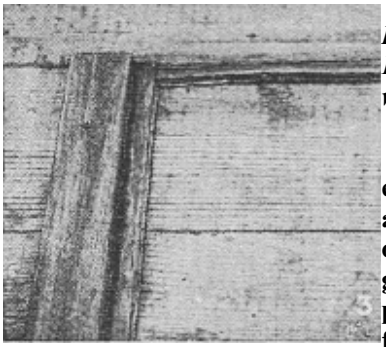
One or two special implements are needed, including the lathykins, made from a piece of hardwood or bone about 7 in. long, and shaped as shown in Fig. 2, which shows a group of the tools required. The point is used for opening up the flanges of the lead before inserting the glass, while the prepared flat end is used for pressing them down again when the glass is in position. Machine-drawn lead cames can be obtained ready for use from various firms specializing in this material. The smaller sizes are generally solid lead, while the larger are often reinforced with a steel core.

The types of glass in common use are the ordinary sheet glass, such as is used in windows, and which may be obtained in various colours, and obscured glass, which is made in different grains or surfaces. One of the cheapest kinds that can be used for tints is rolled cathedral glass; it is made in a variety of colours, is non-transparent, and is very useful where some obscurity is required, as for the panels in a screen or a hall lantern.

A number of glasses are graded under the heading antique, and include pot, flashed, streaky, Venetian, and opal. In the pot metal glass the colouring medium is introduced in the process of manufacture, and

consequently the glass is coloured right through. Flashed glass is only coloured on the surface. Streaky glass exhibits a variety of streaks of different colour. Venetian has a strongly marked pattern, and is a very brilliant glass; opal glass has an opaque white surface.

Preparing the Design. When preparing a design it is necessary to bear in mind the nature of the material and the restrictions it imposes. For example, it is impracticable to introduce very thin lines, except those which are formed by the lead, as obviously there is a limit to the breadth of the glass in the sense that it is extremely difficult to cut a very narrow strip. The desired effect should be obtained therefore from breadth of treatment rather than detail. This only applies to self-colour glass, for when stained glass forms part of the composition the design may be treated in a more decorative and detailed manner. For example, the body of a window made with plain glass of various colours could have a central panel introduced in stained glass which may have some particular feature, such as a heraldic shield or emblem. The best models of such windows should be studied, as it is easy, when dealing with stained glass, to introduce a garish or cheap effect into a window by the use of poor design and colouring.



Leaded Lights. Fig. 3. First stage in the work.

Taking as an example the light for a window composed of pieces of clear glass, the first procedure is to make full size drawings showing the exact arrangement of the separate pieces. The lines upon the drawing should represent the heart or centre of the lead. The size to which the glass is cut must then be smaller by the thickness of the heart (i.e half the thickness for each side). Sometimes the drawing shows also the thickness of the came itself.

When it is necessary to cut up a number of squares or lozenges of the same size, the glass is first cut into strips of the desired width, and then cut across to form the squares, etc. Test the first strip by placing it between odd pieces or came and observing that the centre of came registers with the centre line on the full-size drawing.

When the glass has been prepa-red and the re-quisite quantity of lead is at hand, the framing is placed flat upon a level table or board, and laths are nailed down on two sides of it in register with the line of the rebate, of the window frame, as shown in Fig. 3. The outside lead is then arranged so that half of it will protrude from the rebate and show inside the sight lines.

Inserting the Glass. Before using the lead it should be slightly stretched to straighten it. The lead is laid upon the bench and the grooves slightly opened with the lathykin on both sides. The requisite number of pieces of lead are cut to the length and breadth of the light and laid on one side ready to hand. Sufficient pieces of glass are then inserted into the lead and built up in the vertical direction of the light. The glass is inserted into the grooves in the lead and tapped tightly in position with the handle of the lead knife. As each piece of glass is inserted, it is temporarily fixed by driving a nail lightly a little way into the bench with the side of the nail against the edge of the glass. Short pieces of lead must be inserted between each piece of glass and cut to such a length that their ends will butt against the vertical strips, as in Fig. 4.

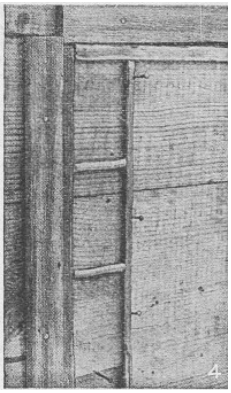


Fig. 4. Three pieces of glass in place, the cames held by pins.

When the first set of glasses has been inserted a long strip of lead the requisite length for the vertical strip is slipped over the edge of the glasses. To do this will necessitate lifting each glass separately from the bench, for which purpose the bent knife is required. This is pushed under the glass and raises it just enough to allow the flange of the vertical lead to be held between the glass and the bench. The temporary nails are removed while the lead is inserted, but fixed behind the lead to prevent it slipping off again. Each nail and separate piece of glass is treated in the same way until the whole length is complete. The light is continued until all the glasses are in position. The remaining two outer leads are placed in position and temporarily secured by nails to the bench. The whole is then pressed tightly against the laths, and afterwards secured by two additional laths.

Before driving the nails into the bench to secure these laths test all the dimensions. Should the panel be oversize this may be corrected by tapping the edge of the lath and driving the pieces of glass more closely together. Corner angles should be tested with a set-square, and when all is in order the second set of laths may be fixed and the joints carefully soldered.

Soldering the Joints. The soldering tool must be tinned before using. The surfaces to be soldered are rubbed over with a composition candle and the solder flowed on to the joint. Neat joints are best obtained when the soldering iron is at the right heat. The face of the iron should be placed only on the joints and held firmly until the solder runs into place, as shown in Fig. 5.

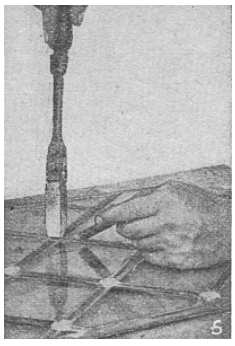


Fig. 5. Soldering the joints.

When all the joints are soldered the panel should be turned over very carefully. Two of the laths can be removed and the panel drawn forward on the surface of the table until it projects sufficiently to allow the hands to be inserted beneath it. It should be grasped between both hands and the projecting portion laid on a strip of wood, while that part of the light resting on the bench is raised with the left hand until the panel is vertical, as in Fig. 6, when it should be turned round and rested against boards which are slanting backwards. The bench is then cleared and the panel lifted by means of boards, laid in a vertical position, tilted over and pushed on to the table. The second side is then soldered as before.

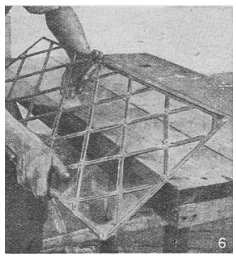


Fig. 6. Turning panel over to solder other side.

For cementing, a small quantity of white lead may be used. Another cement is composed of whiting, plaster of Paris, boiled oil and turpentine, coloured with lamp-black, and with the addition of red lead and patent driers.

The object of cementing is to fill up the grooves and crevices between the glass and the lead so that the panel becomes one solid structure. A good way of doing this is to apply the cement with an ordinary paint brush which has been much worn and has got strong in the bristles, and to brush the cement well in under the flanges of the lead, as indicated in Fig. 7.

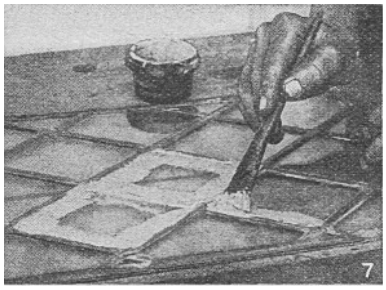


Fig. 7. Brushing cement into joints with an old paint brush.

The corners should receive extra careful attention; proper cementing is evidenced by the cement working right through from the top to the underside of the work. Lift the light from the bench occasionally and see if the cement has worked through. Surplus cement should be wiped off with cotton waste or clean rag, the light turned over and the cement brushed in on the other side. The whole surface of both sides should then be wiped over to remove surplus cement, and the surfaces dusted with whiting. The panel should be set against a sloping board to harden, and allowed to stand for 12 to 24 hours, when it may be cleaned by dusting it over with clean, dry sawdust and the use of a scrubbing brush. Any cement adhering in the corners should be cleaned out with a pointed piece of hardwood. The panel is then set aside to dry and harden for several days.

Fixing the Panels. Leaded light panels are fitted in different ways according to the nature of the frame. A simple method is to fix the panel into a rebate in a wooden frame secured with little battens of wood screwed or bradded. In the case of large panels, strengthening bars of iron or copper have to be fitted, soldering a little hook of copper wire to the leads and twisting it round the iron bars. On outside work the rebate should be loaded with putty or cement prior to inserting the panel. If the light is to be fitted into a window with a stone mullion or framework having a rebate, the holes for the supporting bars will have to be chipped out with a mason's chisel and the light bedded in mastic cement, which may be composed of lime, sand, and a little litharge.

Repairing Lights. Repairs to leaded lights are effected by a process known as stopping in, and presuming only one or two small pieces of glass are broken, these are removed by levering up the flange of the lead with the aid of a lead or putty knife, until the pieces can be removed easily. The new piece is cut to shape, inserted in place, and the lead pressed down smooth again. If this necessitates cutting the soldered joints at the corners, they will have to be resoldered. If several pieces of glass are broken, the best plan is to cut away the whole of the damaged part and replace it with new lead and new glass, soldering and cementing as if the whole were new work.

LEAD SALTS. When applied to ulcers or broken skin surfaces lead salts act as an astringent and help to arrest bleeding. They are common ingredients in douches and lotions, and are sometimes of value for itching. Preparations commonly employed are strong solution of subacetate of lead (Goulard's extract); dilute solution of subacetate of lead (Goulard's water), the most convenient liquid preparation for external use; glycerin of subacetate of lead; ointment of sub-acetate of lead; lead or diachylon plaster.

LEAF. Leaves perform important functions in the life of a plant, but cannot be called absolutely essential organs, branches sometimes performing similar offices, as in the case of cacti and other plants. Nevertheless, if leaves are denuded from plants, the plants will quickly die or else have their vitality greatly injured. The function of a leaf appears to be a combination of lungs and digestive apparatus, which enable a plant to absorb air and nourishment from the atmosphere. In the case of evergreen plants these functions are per-formed for years, but in deciduous trees and plants leaves cease to function after a short period, and the withered leaves fall.

Transpiration with plants varies according to temperature and growth, and this explains why they do not require so much water in cold weather or during the period that blossoms ripen into seed. Free transpiration is essential to the health of plants, and consequently it is important to keep the leaves clean so that they can function properly.

Directions for drying the leaves of herbs for culinary purposes is explained in the article on herb.

Leaf-Mould. Leaf mould is one of the constituents of nearly all potting composts, and in conjunction with loam and sand it forms an ideal rooting material for plants. It also helps to lighten the soil.

The decayed leaves of oak, elm, and beech make excellent leaf-mould, especially oak leaves. Evergreen leaves, such as those of the holly and laurel, are not good for the purpose. All leaves of the right sort should be preserved by the gardener rather than burnt. Decayed leaves are the origin of the bulk of the humus which is found in the soil. They should be swept into a heap, or heaps, in corners as sheltered from the wind as possible. As a precautionary measure it is well to cover them with a thin layer of coarse soil, in order to prevent them from being blown. *See* Begonia; Compost; Loam; Mould; Potting.

LEAK: How to Stop. A leak is recognized by the escape of the contents through failure of some part of the container. In the home, a leak is most common when water pipes burst owing to the action of the frost, and, if neglected, may result in the flooding of the premises.

The pipe should be blocked at some point above the fracture, so that the water cannot flow through the pipe and the leak is stopped. Repairs are effected according to the nature of the material of which the pipe is made. In the case of a lead pipe, this is done by making a plumber's wiped joint, and in the case of an iron pipe, by fixing a new section in place of that which is damaged.

When rain finds its way through a roof or guttering, the leak usually is caused by a broken or misplaced tile or slate, a small hole through the gutter, or through the roof covering if of some material such as bituminous sheeting. The remedies are to replace the damaged tiles or slates with new ones, and close up the fracture in the sheeting. There are several patent compositions which are often effective in curing a leaky roof.

The remedy for a leaking water tap is generally to fit a new washer in place of the old one. Directions for this will be found in this work in the article Tap (q.v.) *See* Frost; Water Supply.

Lean-to Building. This is a simple form of erection which leans against another building. *See* Greenhouse; Shed.

LEASE. A lease is a grant of property either at will or for a period determinable on notice, or for a fixed period by a person who has a greater interest in the property. The person who grants the lease is called the lessor, and the other who receives it the lessee. That which is left to the lessor after he has granted the lease is called the reversion. The lessor need not be the freeholder. He may be himself a lessee from another lessor, and in such a case the lease which he grants to his own lessee is called a sub-lease, and he is usually spoken of as a sub-lessor, and his lessee as a sub-lessee. A lease is usually given in consideration either of a sum of money paid down or an annual rent in money, or both, but it is not necessary that there should be any monetary consideration.

A lease for three years or over must be by deed under seal, but if anyone has an agreement for a lease in writing, and goes into possession of the house or other property on the strength of it, he will be considered a lessee, and cannot be turned out so long as he is prepared to execute a lease if required, and to observe the terms of the lease which was to have been made. The ordinary lease taken by a householder is for a fixed term, varying from 3 to 21 years. Sometimes it contains an option to terminate the lease at certain fixed periods by giving a certain notice, or to renew the lease on notice. The person taking advantage of the option should be careful to give the notice strictly in accordance with the terms agreed upon.

Rates and Taxes. In leases of houses and other buildings, especially in towns, the landlord very often insists upon certain covenants and conditions being inserted in the lease. The most common of these are that the tenant shall pay all rates and taxes, except landlord's property tax, which the tenant cannot agree to pay; a covenant to repair the premises; a covenant to pay the rent, and very often covenants not to use the building for certain purposes. A covenant to pay rates and taxes is simple enough, but sometimes it is put in the form that the tenant shall pay not only rates and taxes, but "all impositions whatsoever," and this sometimes results in a tenant being obliged to pay unexpected burdens which may be placed upon the property by the local authority.

Restriction of Use. It is quite common for leases to contain covenants restricting the use of the premises. Thus, when a landlord owns a row of shops, he sometimes desires to keep the shopkeepers from cut-throat competition; so he decides to let one shop to a butcher, another to a baker, a third to a tailor, and so on, and he inserts a clause in the lease that the butcher shall use his shop as a butcher's shop and for no other purposes without his consent.

Another form which this covenant may often take is that the tenant shall not use the premises for businesses which the landlord considers to be objectionable, or which might be a nuisance to the neighbourhood; e.g. it is common to find a stipulation that the premises shall not be used for a fried-fish shop, or as a soap boiler's, or as a public-house. This is, of course, partly to preserve the value of the property and partly to protect the neighbourhood against nuisances. A third form is to be found in the case of houses on a residential estate.

In some neighbourhoods the residents object to lodging houses and boarding houses and schools and the like occupations which can be carried on in a private house. To protect himself against depreciation the owner of the estate inserts in his leases a clause to the effect that the house shall not be used as anything but a private residence. The courts interpret this clause very strictly; and have even held that a person who established a home for girls out of work, to whom she

made no charge at all, was carrying on a trade or business within the meaning of such a covenant.

At common law every lessee is entitled to assign his lease or to underlet the premises or any part thereof to suit his own convenience. The tenant sometimes agrees not to assign or underlet without consent.

An express covenant is always put in a lease that the tenant shall pay the rent, and this is done to make the tenant take or send the rent to the landlord. If there is no express covenant by the tenant to pay the rent the landlord cannot distrain upon the premises or sue for the rent unless and until he has made a legal demand for it. A legal demand must be made after the rent has become due, and upon the premises themselves between the hours of sunrise and sunset.

Breaches of the Covenant. Where a tenant is guilty of a continuing breach of some covenant which is not immediately remediable by the payment of a sum of money, the court will injunct him from continuing to do it. In the case of a breach of a covenant to repair, the landlord can always get as damages the reasonable cost of doing the repairs. But nearly every lease in these days contains what is called a condition of forfeiture and re-entry, whereby it is stipulated that if the tenant shall fail to pay the rent or to perform and observe the covenants contained in the lease, then the lease shall be forfeited and the landlord shall have the right to enter upon the premises and take possession of them again.

Before taking the step of trying to eject the tenant the lessor must, however, give the lessee notice of the breach of covenant complained of, requiring him to remedy the breach, to pay compensation for it, also to pay the costs of the landlord's solicitor and surveyor in connexion with the matter. After the notice is given, the lessee must be allowed a reasonable time within which to comply with it, and if he does not do so the lessor may then take action.

It should be observed that the forfeiture of the lease does not exonerate the lessee from paying damages. Even after the lessee has failed to comply with the notice and the landlord has brought his action in the court, if the lessee comes forward and expresses his willingness to comply with the covenants and pay reasonable compensation, the court will not allow his lease to be forfeited, but will suspend the action to give him time to do what he ought to have done at first. The lessee will also have to pay all the costs of the lessor.

An exception to the rule about giving notice is when the tenant has failed to pay his rent. In this case the lessor can bring his action for forfeiture without giving any previous notice or requiring the lessee to remedy the breaches of which complaint was made.

If a lessee of premises continues in occupation of them after his lease has expired he is said to hold over. The tenant who holds over and pays to his lessor rent on a yearly basis becomes a yearly tenant upon the same terms as the lease, and his tenancy will be only determinable by six months' notice on either side, which notice must expire at the end of a current year of the tenancy.

The Rent Restriction Acts, so long as they continue in operation, entitle a tenant under a lease to hold over after the expiration of his lease, but if he pays rent to the landlord no presumption arises that the landlord has accepted him as a yearly tenant. He is what is called a statutory tenant. The landlord can raise his rent to the amount which the statute allows by giving a month's notice of his intention. *S e e* Agreements; Building, House.

LEASEHOLD. This is the name given in England, Wales and Ireland to land that is let on a long lease for building purposes, not sold as is freehold. It is usually leased for 99 or 999 years for an annual payment known as the ground rent. At the end of that time the land, and also any buildings that have been erected thereon, revert to the successor of the one who granted the lease. Such buildings must be handed over in good condition. It should be noted that leasehold property is regarded as personal, not as real estate.

LEASH: For Dogs. Some form of leash is desirable for dogs when they are taken out for a walk. The various leather leads that can be purchased are undoubtedly the most satisfactory, and they can be had, either round or flat, suitable for almost any breed. See that the swivel at the end has a strong spring; otherwise it will continually be coming off the collar. The leather may be preserved by rubbing occasionally with Mar's or castor oil. For very powerful animals a chain may be preferred, but it is much heavier and less comfortable for the hands. *See* Dog.

LEATHER & ORNAMENTAL LEATHER WORK
The Necessary Tools and Simple Methods Described

The following article contains many useful hints on materials and accessories required for this decorative craft, together with practical directions for modelling and colouring leather.
See also the entries on Boot; Glove; Lacquer Work.

When choosing leather for an important piece of work such as a fire screen, large bag or blotter, it is advisable to purchase a quarter skin of medium growth. Older skins are coarser and young ones cut to waste. Merchants charge more in proportion for supplying panels of flawless pieces, and if there is a surplus of material after cutting out the required amount for the work in hand, the extra pieces can be made up into smaller articles. Skins are usually sold by the square foot.

English calf skin is the best leather for plain or modelling purposes. It can be prepared so that embossed work retains its shape without padding. Kip calf, or East India kip, is a less expensive leather with a coarser grain, but is also good for modelling work. Cowhide is a useful leather for large pieces of work such as a screen or a shopping bag. It models, stains and wears excellently. As the skins are very large

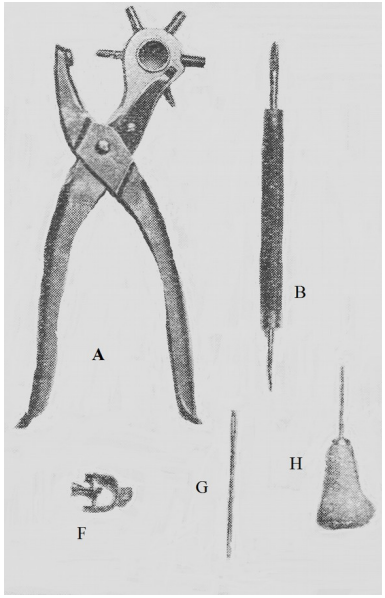
these leathers are obtainable at the lower rate in eighths as well as in quarters and halves. A cheaper underhide is obtainable in narrower widths. Russian leather has a beautiful surface for bookbinding work. Morocco is made from the finest selected and hand-dressed goat skins. Pigskin is light, but very tough and durable. The reptile skins, crocodile, alligator, lizard and snake, make ornamental but expensive leathers.

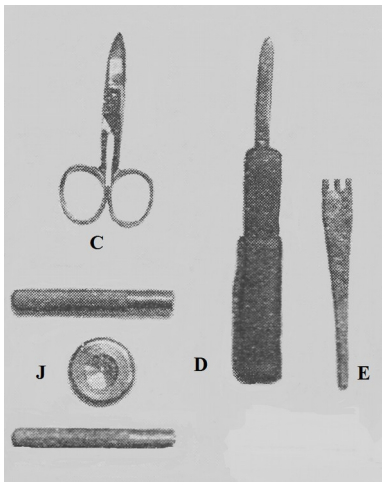
Lining and Imitation Leathers. Persians are hard-wearing and made from foreign sheepskins. They are obtainable in browns and several other colours. Velvet persians are a fancy form of this leather with a suede finish. Persians are used extensively for lining first-class work. Degrained persians are a superior form of suède, finished leather used for golf coats and other dress wear. Velvet sheepskin is similar in appearance to velvet persian, but coarser, and is used for making bags and blotters, etc., required with a suède finish. Less expensive for smaller articles is a strong leather made from hide splits and known as velvet splits. Plain skivers are cheap and useful lining leathers. These are the upper grain of split sheepskins. The under or flesh split is called chamois, though only an imitation of the skin of that almost extinct animal. Skivers should be strengthened by pasting to leather, linen or board. They are not suitable for pockets or gussets, as they tear easily. They are obtainable in plain colours, in fancy shadings and in nappa finish. White kid is used for glove making and linings, and lacing calf for thongs and gusseting for pockets.

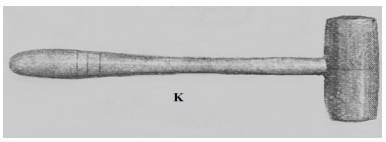
Imitation morocco is made from sheepskin with a grained instead of a velvet surface. Polished crocodile, in large or small grainings, and velvet crocodile are copied well in hide. These are strong and effective leathers for shopping bags, pochettes and undecorated blotters. Lizard-grained sheepskin is also an excellent imitation of another reptile skin which can be most successfully made up into handbags.

Tools and Accessories. Simple outfits are best for the beginner. There are many excellent ones on the market which vary slightly in their contents. A useful set of tools comprises: a transparent set square for correcting angles and cutting the various parts of the work to fit; being marked with inches and quarter inches it takes the place of a rule; sharp knife for cutting leather and turning edges (Fig. 1, D); double-edged ball tool for embossing, i.e. pushing up the design to raise it from the back; combination tracer-modelling tool, used for tracing and modelling the finer parts of a design (B); pliers punch for punching holes in the leather before thonging (A); boxwood mallet for flattening out corners and pressing the edges of finished work (K). A large-eyed blunt needle is required for use with leather thongs (G). A rug needle will do.

A Dresden tool is often used for backgrounds and completing delicate detail. One end is shaped like an inverted V and the other forms a semi circle. Both these working ends are thin and smoothly finished. A purse crease is a useful tool for finishing the edges of leather work. It is heated over a gas jet and held vertically. The groove in the creaser fits over the edge of the leather. To round corners it is important to move the article round to meet the creaser. A well finished smoothly indented crease is thus easily made. A brass holing gauge (Fig. 1, F) is a detachable device for the punch pliers which enables the worker to punch holes accurately at equal distance both from the edge of the article and from hole to hole.







Leather Work. Fig. 1. A simple outfit. C, paring scissors. D, cutting knife. E, stitch tool, J, press button punch and die set.
A, six-hole punch pliers. B, combined modelling and tracing tool. F, holing gauge for pliers.
G, needle for thonging.
H, awl.
K, boxwood mallet.

A brass die outfit (J) for fixing press studs and eyelets to bags and other articles can also be obtained, and press buttons can be bought in various sizes and colours. Each press button consists of four parts: two upper pieces, cap and cap eyelet; and two under pieces, spring and spring eyelet. Directions for the use of these outfits are sold with them, but if the amateur wishes it is possible to get press studs put in work by a leather merchant or sadler. Matting punches for ornamental work are used for simple forms of decoration instead of modelling the leather and are sold with a number of fittings.

Many other helpful accessories are obtainable. Metal corners can be bought ready for fixing in wallets. Zip fasteners, bag mirrors, frames and locks for bags and metal edges and tabs. Made-up bag linings are also supplied with patterns showing the exact sizes of the outside covers required to fit the inners. Inners for

wallets, blotters, pochettes and other articles can be fitted to the panels embossed or decorated by the home worker. Frames are obtainable for fire-screens in oak, mahogany or walnut. Rubber linings are made for leather tobacco pouches. Thongs are prepared for use in various widths and lengths of persian and calf.

Aniline spirit dyes are chiefly used for colouring leather work. A special polish is sold to give a brilliant finish; manilla board is used for stiffening purposes and pattern making, and a cement or flour and water paste for fixing linings, etc. Bronze powders and silver and gold leaf are suitable for decorating leathers, and may be supplemented with transparent lacquer colours. Designs and patterns are obtainable in great variety for decoration and articles in leather.

Modelling or Embossing. Having cut out a piece of leather to the required size, damp it with a clean sponge and water, place it on a drawing board and fix the selected design over it by means of drawing pins, beyond the edges of the leather to obviate marking this. Having traced over the whole design with the tracing tool, remove the paper and trace the design again firmly with the tracing tool on the leather itself.



Leather Work. Fig. 2. Useful book or shopping bag in hide decorated, with a modelled conventional design.

To raise into relief portions of the work from the back, if the panel is a large one, the leather is held in position by the left arm, the first finger and thumb of the left hand limiting the particular portion of the design being raised, while the right hand underneath the panel pushes up the leather, between the left finger and thumb, with a ball modelling tool, working it to and fro. Care must be taken not to stretch the leather too much. High relief does not look well in leather except in rare instances, when it is usually filled with a padding of cotton wool pasted to the back of the leather and covered over with paper, pasted on before affixing the lining. Medium and low relief should require no filling out if a good quality of calf or hide is used for this work. All the raising work required is done from the back before any modelling is begun on the front of the leather.

Having completed the raising, lay the panel flat on a piece of plate glass; or, if a soft surface is required, pin several sheets of blotting paper on to the drawing board. Then holding the modelling tool at an angle of about 45°, press the whole design down into position along the traced lines. Use the tool in one direction only and with sweeping strokes, to produce a distinct groove, without creasing the background. The heavier the leather the more frequent will be the damping required to keep it soft. Having thus completed the raising and depressing of the principal portions of the relief, work is now done with a Dresden tool on the detail and background. Using the same long, sweeping strokes, the whole design is thrown up by this means into varying shades of relief. In really good leather craft, designs are not overworked, but accomplished with a minimum of strokes and curves. Matting punches are often used for backgrounds to give them variety of texture. The whole of the ground must be covered and the punch is held upright, the same force being given to each blow of the boxwood mallet on to the punch. Where very low relief is required the background is merely pressed down without raising the design from the back.

Staining. In all decorated leather work it is essential that the surface should be absolutely clean before using any stain. When the design is completed the whole piece of leather should be damped over with a clean sponge moistened in water, and then oxalic acid solu-tion is applied with a pad of cotton wool. When this is dry, colouring may be proceeded with. An antique effect is obtained by applying a coat of bichromate of potash to the leather after it has been cleaned. Choose spirit stains of the required colours and mix them with methylated spirit to the tint suitable for the particular work. In some cases the entire surface of the leather is stained one colour, in others several shades are used to bring out the designs. The leather must first be damped before applying stains.

After the article has been coloured (excluding the design if that is to be multi-coloured) and the stain allowed to dry, begin to paint in the design with a camel-hair brush, working quickly to avoid hard lines, as these stains dry rapidly. Several coatings of a stain may be required for dark colours. For large surfaces stains are applied with flat wash brushes or with pads of cotton wool. Shading and tinting require practice. Several colours may be merged into one another by painting them on with small, rather dry brushes. If the effect is crude when finished, a softer one can be produced by a quick wash of very thin background colour over the whole design. Staining may be used to colour designs without embossing, and embossing without staining, as forms of decoration in leather work. The natural colour of calf is beautiful in some modelled work. Small pieces of leather may be utilized to make artificial flowers. Once modelling and colouring have been grasped these can be effectively copied from real or imitation flowers. Skivers and suède are mostly used for this work, and flower centres and other accessories can be bought for it. *(See* Artificial Flowers.)

Thonging. Lacing leather by means of narrow thongs threaded through a rug needle is a simple method for fastening, and is also used for ornamental edging as seen in Fig. 7. If thonging is to present a

workmanlike appearance it is essential that the spacing between the holes is accurately gauged. Using a lacing of ⅛ in. wide, the holes should be 3/16 in. from each other and from the edge of the article. By means of the holing gauge device already men-tioned, marking and measuring are rendered superfluous.

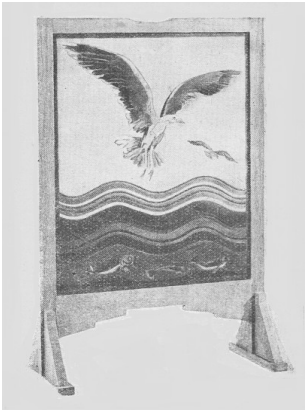
In use it has been found that shorter lengths of thonging are the most practical. Dragging more than 30 in. of lacing through a large number of holes merely to avoid joining is not only waste of time and energy, but also is apt to spoil the look of the work and to twist the thong. To start, fix the end of the thong between the lining and the leather with paste, and sew as if overstitching. To join thonging, pass the old and new piece through the same hole at the actual join, the old one from the back and the new one from the front, and paste about ¾ in. of each under the lining, cutting off the superfluous length of the old piece. Another method is to shave off each end and paste them together, but this is not so durable.

Hide Book Bag. A most useful bag for books or for holding oddments when travelling is illustrated in Fig. 2. It can be made from two pieces of cowhide each 14 in by 11 in.; two pieces of brown persian or of skiver for lining of the same size; two pieces of persian calf 14 in. by 1½ in.; one piece of hide for the gusset 36 in. by 3 in. (the gusset is without joins); one piece of lining for same; four pieces of hide for handles, 11 in. by ¾ in.; brown stain, paste and thongs.

A conventional design is traced on the upper portion of the bag. Any good oblong formation which comes to within about 2 in. of either side and 1½ in. from the top will be suitable., The background of the design is pressed down, but the latter is not raised from the back for this piece of work; it is lightly modelled with a modelling tool from the front. Both sides of the bag are stained dark brown.

When cutting the 36-in. strip of persian for lining the gusset, allow 1 in. for turning at either end to neaten and strengthen. Turn down firmly and then paste the lining to the gusset. Paste the lining to the back and front pieces of the bag. Lay two pieces of leather together for each handle, and thong them all round on both sides. Fix the handles on to the back and front pieces of the bag temporarily with paste, and paste over them the two strips of persian calf, 1½ in. wide, to neaten and strengthen the top of the bag. Thong along the top of the bag through leather and lining and through the handle pieces and strips, to fix them firmly to the bag. Trim the sides of the bag pieces quite evenly and see that they are of exactly the same size. Now thong the sides and the gusset strip together, working from the top corner all round the front pieces, and then do the back piece in the same way. Stain the thonged edges brown to match the rest of the bag.

Fire Screen. The panel for the fire screen illustrated in Fig. 3 relies on colouring and not on modelling for its decoration. A variety of designs are obtainable which would be suitable for such a screen. Having traced the design in the manner already described and gone over it lightly with the modelling tool, the spirit stains are applied, using dark brown for the gull's wings and tail, tipping them with black or with white to bring out the feather markings. The top of the body and head are also white, the eye is black, and the beak and legs scarlet. The curves of the sea are in white and gradations of blues and greens, while the fish are in browns and white. The sky is left the natural fawn colour of the leather.



Leather Work. Fig. 3. Fire screen of painted leather, mounted on a 3-ply wooden backing and framed in oak.

The leather panel when painted is covered with a thin layer of paste and affixed to a 3-ply wooden backing. This is allowed to dry thoroughly before framing. It is kept in position by hammering gimp pins through the beading to the sides of the screen. The panel is polished with a special leather polish to give it a glossy surface. Screen panels are also sometimes thonged to frames which are furnished with screw eyes.

Embossed and Coloured Blotter. To make the blotter illustrated in Fig. 4, cut out the panel in calf skin or hide, 22½ in. by 14 in., this being the size when opened out. Choose a bold, conventional design, and after damping the whole surface that is to take the design, trace this as directed in the general instructions for leather work tracing. Now proceed to carry out the instructions given for modelling leather and for punching the background; then to stain the embossing in different colours, proceed as directed for staining.

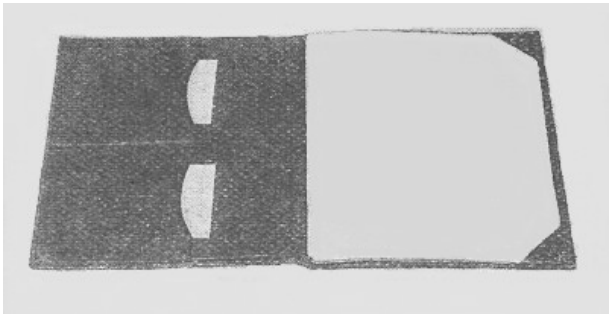
When the design has been completed and the skin is ready to be made up, cut out a piece of skiver ¼ in. smaller than the calf-skin and place this over the inner side. The skiver can be obtained to match the background colour of the blotter. A better article results from using a plain persian lining. The finished cover can be sent to a leather merchant to have an inner fitted to it if desired.

Fold the calf-skin over the skiver and paste down securely. Cut out two triangular pieces, 2 in. by 2½ in., and paste these across each of the right-hand corners. Now cut out a piece of skiver 10 in. by 16 in. and fold over one edge of the wider side ¼ in., pasting securely. Cut out another piece 14 in. by 7 in. These pieces make the inside flaps. Turn the edge of the smaller piece to make a ¼ in. hem and paste down. Now place the smaller flap over the larger, bringing the bottom edges together, and machine them together through the centre, thus making two pockets. Machine the sides of

the smaller pocket on to the larger. Place the bottom edges to the edge of the blotter and the sides of the larger flap to the sides of the blotter. The extra inch on each side of the larger flap must be folded in, gusset-wise, and flattened down.



Fig. 4. Front cover of a blotter in calf skin or hide, embossed in a bold conventional design. The inner fittings are shown in Fig. 5.



Leather Work. Fig. 5. Interior of blotter of embossed leather, the front cover of which is shown in Fig. 4.

Now open the blotter out flat and machine all the way round, joining the edges of the skiver to the outer skin and joining the two flap pockets on also. Care should be taken that all the parts are exactly in position before being machined, as the work will probably be spoiled if the machine stitching has to be undone. A ¼ in. strip of calf, stained to match the lining, cut the length of the blotter must be sewn securely at the top and bottom edges at the exact centre, inside the blotter. This forms a strap for the blotting paper to be slipped through. This strap should be glued in position before the machining is begun, as it can then be machined in with the lining and pockets. These are shown in Fig. 5.

The blotting paper sheets should be cut ¼ in. smaller than the blotter and slipped under the narrow strap the whole width of the blotter. Turn all the blotting paper sheets over on to the right side and slip the corners into the triangular pockets. The whole blotter can be finished off by wax polishing. To do this, put a small quantity of polish on a piece of flannel and rub it carefully into the whole surface, using a circular motion. Continue this until an even polish has been applied. Leave for a short time and then rub over with a soft flannel.

Decoration with Silver and Gold. When the methods of modelling and staining have been successfully practised there are several forms of decoration which give beautiful and antique finishes to leatherwork. Lanellé is a form little known in England. It derives its name from the silver thongs used in the decorating. These are often interlaced to form a kind of mesh. Lanellé is used in conjunction with modelling. To carry out this work, thin strips of silver are cut ⅛ in. wide. The leather is placed on a board and holes punched with a single thonging punch at the points where it is desired to thread the silver.

The silver is threaded from back to front, and is tapped with a tiny hammer so that it shall lie flat. It is threaded through the next hole from front to back, and so on, until the design is completed. The silver is cut off and pressed flat. When the silver thonging is finished it must be tapped at the ends and at the back with the hammer to ensure that it will lie flat. Most of this class of work is thonged round the 4 edges when finished, but the example shown in Fig. 6 is finished with a crease made by the purse creaser already described.

The design for the loose cover for an A.B.C. or telephone book illustrated in Fig. 6 has been thonged, after the modelling has been completed, with silver in the central motive and at the bottom, also on the outer edge. The background has been gilded with gold bronze powder. To make the cover, the calf to be de-corated is cut out in one piece to fit the book, allowing ½ in. over for the edges to project. For a telephone book cover the panel of calf required would be 20½ in. by 12 in., and the skiver for lining would be cut 21 in. by 12½ in. to allow for turnings when pasted inside the cover. For an A.B.C. cover the calf would measure 12½ in. by 8½ in., and the skiver for lining 13 in. by 9 in. When making up, eyelet holes are punched into the back of the cover top and bottom for a thong, or cord, to be passed through which holds the book in place.

A fascinating form of leather work is Venetian lacquer on leather. This may be worked with gold or silver leaf, but it is simpler to employ bronze powders. These are obtainable in small tins, the upper part of which holds the silver or gold powder, and the lower contains the special medium for using with it. The diary or address book cover in Fig. 7 has a raised and modelled design which has been ornamented in this method. Flat brushwork is also possible, and very beautiful effects are carried out on leather with a flat design painted in bronze powders and transparent lacquer colours.

The modelling of a raised design is first completed with the exception of punching— if it is desired to work up the background in this manner—which is done after the gold has been applied. Mix a little gold powder to the consistency of cream with the medium in a small

container or tinting saucer. Pass this mixture evenly over the surface of the leather, using a flat-topped Japanese stencil brush. Work in circles to avoid streaks. Cover over all the leather, and if necessary give it a second coat after allowing 15 minutes for the first to dry. No sizing is required. Now leave the work for half an hour to dry, then coat over the parts to be left plain gold—in the case of the cover illustrated the back and the border— with a thin coat of spirit varnish. Then on the central unvarnished portion of the front where the design has been raised the colouring is applied with transparent lacquers. Yellow is applied first for the background, and then blue is put quickly over it to make it a green colour, while the raised design is worked up with yellow first and then red for shading, so that it has an orange effect.

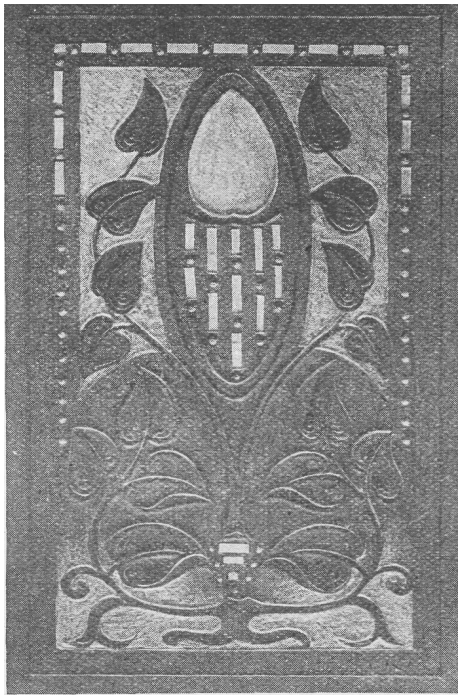


Fig. 6. Design for a telephone or reference book cover in silver thonged or lanellé work.

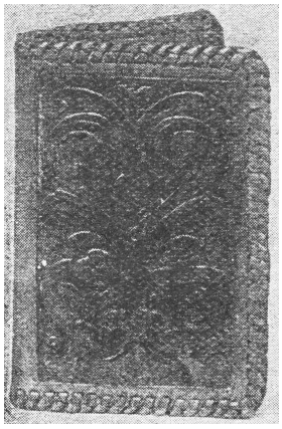


Fig. 7. Diary or address book cover in Venetian lacquer on leather.

When the painting is completed the diary cover is ready for mounting, and the thonging must be painted with gold powder. When the making up is finished the thongs are painted over again with gold. To make such a cover the worker will need 1 piece of calf 8½| in. by 6½, in., 1 piece of persian for lining 9 in. by 7 in., 2 pieces of calf-finished persian 3 in. by 6½ in. The two last pieces are used to make the pockets into which the diary covers are slipped to keep the book in place. Stick the lining to the finished calf panel, turning in the edges of the former to match. Turn in the edges of the neatly pared pieces of persian calf for the pockets and stick them down with paste. Lay these pieces to the edges of the cover and thong all round.

LEATHER CLOTH. This cloth, as its name implies, is a substitute for leather, and is used mainly for upholstering. Manufactured by a patent process, it is obtainable in almost every colour with a variety of grains, morocco, antique leather, and pig and buffalo skins being among the leathers simulated. The cloth is dampproof and fadeless, and requires no special cleaning. Dust or stains may be removed with a damp cloth without destroying its lustre. Leather cloth may also be used for panelling walls. *See* Panelling; Upholstery.

LEATHERJACKET. The larva of the daddy long legs or crane fly is popularly termed a leatherjacket. The grubs of this fly are about 1 in. long, two or three times as thick as the wire worm, brownish-grey or black, and exceedingly tough. They have hard black heads and jaws. They are very difficult to reach underground. Watering with a very strong solution of nitrate of soda has been found harmful to them. Special preparations are sold by seedsmen for the destruction of leather jackets. *See* Crane Fly; Insecticide.

Leaven. In its household application leaven is used as a synonym for yeast (q.v.).

LECLANCHÉ CELL. This is a primary cell used for converting chemical into electrical energy. It is largely employed in electric bell work. A single fluid cell, it consists of an outer glass vessel containing the electrolyte or chemical fluid, which is a saturated solution of sal-ammoniac.

Standing in the solution is a porous pot, made of a kind of earthenware, and filled with a mixture of black oxide of manganese, or manganese dioxide, in the form of a coarse powder. In the centre of the pot and surrounded on all sides by the oxide of manganese is a plate of carbon. The top of the porous pot is closed with a layer of pitch, or similar material. The carbon plate comes up above this pitch, and has attached to it a brass terminal for connecting to the conductor, or wiring system.

In the space between the outer vessel and the porous pot is placed a zinc rod, usually circular in section, and terminating at its upper end either with a terminal or with a short length of insulated copper wire soldered to it. This class of cell has an electromotive force of 1½ volts, and is suitable for supplying an intermittent current. It can be left on open circuit for a long time without deteriorating, and has the property of recuperating when not used for a time.

The chemical action results in the zinc rod being consumed, and at the same time the sal-ammoniac is used up. For each oz. of zinc consumed, 2 oz. of sal-

ammoniac will be used up, so that whenever the zinc rod has to be replaced the electrolyte should be renewed. After about four zinc rods have been eaten away it will be necessary to replace the porous pot and its contents.

Leclanché cells snould be recharged by thoroughly cleaning all the parts, putting in fresh zinc and refilling with fresh sal-ammoniac solution. The solution is made by putting into clean, preferably distilled, water as much sal-ammoniac as can be dissolved, but no more. The proportions are about 3 oz. of sal-ammoniac to 1 pint of water.

Too much of the sal-ammoniac must not be used, or a deposit will form around the bottom of the cell and impede its action. Local chemical action may be set up, resulting in the rapid deterioration of the zinc. Since the deterioration takes place more at the top of the zinc than at the bottom, there is little difficulty in finding out whether the cell is too heavily charged with sal-ammoniac. Leclanché cells are used for batteries, several cells being connected in series to increase their voltage, or in parallel to increase their amperage. In the former case, the wire from the zinc rod of one cell is connected with the carbon on the next. In the latter, all the zincs are connected together and all the carbons together. *See* Battery; Bell; Sal-ammoniac.

LEECH. Though now rarely employed, the leech was formerly much used for removing blood to relieve local congestion, e.g. in certain eye diseases, etc. As a rule, they drop off when surfeited; but when they remain too long, the application of a little salt will make them quit their hold. Bleeding from the bites is usually easily arrested by pressure. Care should be taken not to apply a leech over a vein, too close to an eye, or not in any case to persons prone to bleeding.

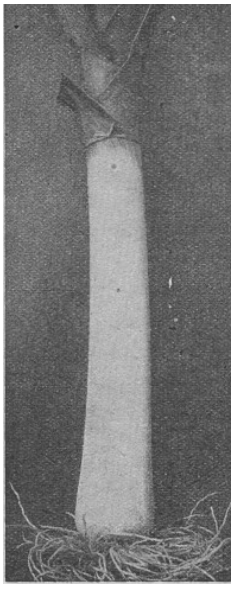
LEEDS WARE. As the Leeds pottery was active for 120 years after its establishment about 1760, there is no scarcity of examples of this beautiful ware. The principal body was a fine cream-ware with a rich arsenic glaze, inclined to a greenish tinge.



Leeds Ware. Girl with birdcage, small figure dating from about 1780.

Many of the best pieces, except in the blueprinted ware, are unmarked. Among the marks used are Leeds Pottery, sometimes crosswise; Hartley, Greens & Co., for the best period; L.P.; and after 1863, B.B. & S. The pieces to look for are those decorated with quiet enamel colours, together with the large class of perforated or basket ware.

LEEK. This is a valuable hardy winter vegetable; the edible part is provided by the blanched stems. For ordinary purposes seeds are sown out of doors in March or April in shallow drills on a seed bed. If the seedlings are not overcrowded they may remain undisturbed until July, when they are planted finally. Deeply dug and manured soil is neces-sary. Holes 8 in. deep should be made with a dibber, one seedling being placed at the bottom of each hole, and the roots covered with a sprinkling of soil. As the plants develop they will become blanched, and more soil may be moulded up to produce a greater length of blanched stem. The holes ought to be 6 to 8 in. apart and the rows 15 to 18 in. from each other.



Leek. Roots, blanched leaf-bases, and leaves.

To obtain the finest leeks with a good length of blanched stem, the seedlings should be raised under glass in February and planted in early summer in trenches dug on rich ground. As the plants progress the trenches are filled in with soil to blanch the stems. Another method is to plant the seedlings on the ground level and to blanch the stems by means of stiff paper bands. Two excellent varieties of leek are the Mussel-burgh and the Lyon.

How to Cook. The leek is used either as a vegetable, as a garnish or as a flavouring for soups etc.

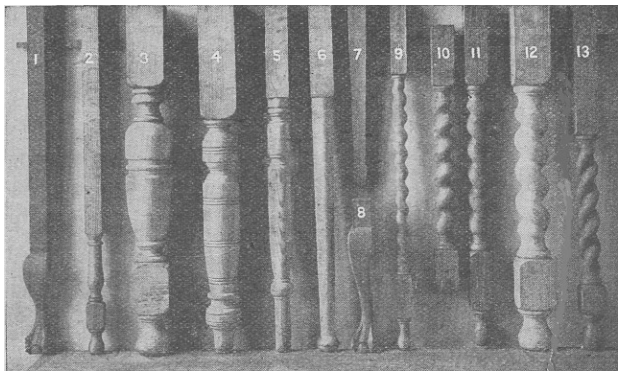
To stew leeks, trim and wash them, cut them in half lengthwise, and then leave them to soak for about half-hour in a bowl of cold water to which a little vinegar has been added. They should then be drained, cut up again if necessary, and put into a pan containing enough stock or salted water to cover them. Stew them slowly with the lid on the pan for about half-hour, or until they are tender, then season, and before serving add a small lump of butter. White sauce is often served with leeks, or they are excellent if, when cooked, they are covered with a good cheese sauce and browned in a fireproof dish in the oven before serving au gratin as a vegetable entree.

LEG: The Limb. The whole lower limb is often referred to as the leg, but the term is more appropriately applied to the portion between the knee and the ankle. In this sense the leg has two bones: the tibia or shin bone on the inner side, and the long, slender fibula on the outer side. The latter takes no part in forming the knee joint, but its lower extremity is an important part of the ankle joint, being that bone which forms the prominence on the outer side of the ankle.

The inner surface of the tibia lies just beneath the skin without a covering of muscle, and is thus much exposed to injury from knocks. At the back of the leg the calf is formed by the muscles which are inserted by the strong achilles tendon into the back of the heel bone. This tendon may be ruptured by sudden strain. Large superficial veins travel up the leg, carrying off

the blood from the foot and leg. These may become varicose and dilated. The veins then stand out prominently when the person stands up, but collapse more or less when he lies down.

In a fracture of the leg both bones are usually broken. *See* Ankle; Bandage; Foot; Fracture; Knee; Thigh; Varicose Vein.



Legs for Furniture: stock patterns which the home worker can procure. 1, cabriole cabinet. 2, cabinet. 3, 4, dining table. 5, kitchen table. 6, table. 7, tapered. 8, cabriole stool. 9, Jacobean table. 10, 11, swinger and leg for gate-leg table. 12, dining table. 13, sideboard.

LEG: Of Furniture. A leg is a slender support to anything, something that in purpose resembles the human leg. Stands for flowers and stands of other kinds have legs, while the word is used for the supports to certain kinds of dishes and other table utensils. Certain forms of furniture leg have special names, an example being the cabriole leg.

Turned Legs. Table or cabinet legs often present some little difficulty to the amateur worker, who is generally obliged to get the work done by a turner. It is possible to obtain turned or shaped legs of certain stock patterns in sets from timber merchants, and their use saves the home worker a lot of trouble. We illustrate a group of designs photographed from the stock of one of the many suppliers of wood turnery. It will be noted that tapered, turned, twist, and cabriole legs are included, and in the case of those for gate-leg tables the necessary swingers for the gates are available en suite. *See* Cabriole Leg; Chair; Furniture; Stretcher; Table; Turning; Woodcarving.

LEGACY. A legacy is a gift of personal property by will. A gift of real property is called a devise. Legacies are of three kinds: specific, demonstrative, and general.

A specific legacy is a legacy of a specific thing, e.g. "my gold watch" or "my £200 London County Council Stock." A demonstrative legacy is a legacy, not of a specific thing, but where the testator points out or demonstrates the fund or property out of which the legacy is to be made, e.g. "I give to my son John £1,000 out of my Great Western Railway Stock."

A general legacy is the legacy of a sum of money in general terms without indicating any particular fund or source from which it is paid, e.g. "I give to my daughter Mary the sum of £500." The advantage of a specific legacy is that if the testator's property is not sufficient both to pay his debts and to pay the legacies, the executor must resort to specific legacies last or, as it is sometimes said, specific legacies do not abate.

Demonstrative legacies share in the advantages of specific legacies in that they do not abate, but if the fund pointed out for payment of a demonstrative legacy is not in existence when the testator dies, the legacy is payable out of the general funds of the estate. A specific legacy, on the other hand, goes altogether if the thing bequeathed is not in existence when the testator dies.

Two Examples. For example, "I give to my son John my gold watch." If I sell my gold watch before I die, John gets nothing in lieu thereof. But if I say "I give to my son John £500 out of my money standing to my credit in Barclays Bank," and when I die I have no money in Barclays Bank, John gets his money out of the general fund if there is any; in other words, it is just as if I said "I leave to my son John £500". On the other hand, if I do leave money in Barclays Bank when I die, my executors must pay my debts out of other funds before resorting to the Barclays Bank money.

To give a complete example, a testator bequeathed £1,000 to John, £1,000 to Mary, £1,000 out of his money at Barclays Bank to Susan, and his gold watch to Isaac. The watch is worth £100. The debts and funeral expenses amount to £2,500 and the testator's total assets are only £4,000, including the above legacies. The debts must be paid, so the executor, who has £1,000 besides the legacy money, requires another £1,500 to satisfy the debts and expenses, and this he will take out of the general legacies left to John and Mary, viz.: £750 from each. He will not touch either the demonstrative legacy left to Susan, or the watch left to Isaac.

The Legacy Duty. This is a tax paid in Great Britain and many other countries by persons who inherit money either under a will or on intestacy.

In Great Britain the duty varies according to the relationship of the legatee to the deceased. Husband or wife and relatives in direct line, i.e. parents, children, and grandchildren, pay 1 per cent.; brothers, sisters, nephews, and nieces pay 5 per cent.; while other relatives and strangers in blood pay 10 per cent. Relatives of the husband or wife of the deceased are regarded as strangers in blood. Legacy duty is not payable by a widow or child under 21 who inherits a sum of £2,000 or less, or by a husband or any relative in the direct line who inherits £1,000 or less. Moreover if the whole estate does not exceed £15,000 in value, legacy duties are not charged on money inherited by a husband or wife or by relatives in the direct line whatever the amount they receive.

It is the executor's duty to pay the legacy duty out of each legacy before handing over anything to the legatees. If the legacy is payable "free of legacy duty,"

the executor must pay the legacy duty out of the general funds of the estate, and not out of the legacy itself. *See* Estate Duty; Executor; Probate; Will.

LEGAL TENDER. This phrase is used in English law for the coinage which a creditor is bound to accept when payment of a debt is offered to him. A creditor is not bound to accept a cheque unless that method of payment has been customary between the parties, or a large sum of money in shillings or other silver coins; he can legally refuse to take it, and the debt will remain unpaid until the debtor returns with the money in legal tender.

Legal tender consists of Bank of England notes and gold to any amount. Silver coins are legal tender up to 40s. and bronze coins up to 1s., provided they are those issued by the royal mint. Bank of England notes, it should be said, are not legal tender in payments made by the Bank itself. In Canada, Australia, and other parts of the British Empire the same principle prevails. Gold is legal tender to any amount and other coins up to a certain figure. In Canada the gold coins of the U.S.A. are legal tender.

LEGGINGS. Leggings, usually of leather or canvas, are sometimes worn in bad weather and by those who work in the open air, by sportsmen, chauffeurs, and others. Leather leggings are usually either black or tan in colour, and are fastened either with buttons or with straps, the former being the more general. Canvas leggings are usually light in colour, drab being a common shade for them.

Leggings are sold in sizes, the lengths usually stocked for men being 11½, 12. 12½, and 13 in. Their calf measurements vary also. If leggings are ordered by post it is well to give the measurement round the centre of the calf, and to state whether this is bare or over the breeches. Leggings and boots in one piece are known as Wellingtons. Leather leggings should be cared for in very much the same way as boots. Canvas leggings can also be kept clean by brushing. *See* Boots; Gaiters.

LEGHORN: The Straw. Leghorn is a fine, soft straw used chiefly for children's summer hats in its natural colour. It wears almost indefinitely and requires very simple trimming. *See* Hat; Straw.

LEGHORN: The Fowl. This breed undoubtedly stands first as an egg producer. It lays a large, white-shelled egg, is a non-sitter, and possesses no merit as a table bird. From an economic point of view it is cheaper to keep than most breeds, as it consumes a smaller quantity of hand-fed food in comparison with its output of eggs.

Apart from this, it is one of the most attractive denizens of the poultry yard, its plumage, be it white, black, brown, or cuckoo, contrasting vividly with its yellow shanks and bright red comb and wattles. *See* Fowl; Poultry.

LEMON. The Plant. The lemon is a greenhouse evergreen shrub which will flower and mature its fruits in a glasshouse having a minimum temperature of 50°. The plants should be placed in pots in a mixture of loam, enriched with manure, crushed bones, and charcoal. They should be watered freely all the summer. The temperature during these months should range from 60° to 65°, but may be dropped 10 points during the autumn and winter.

The flowers, which are white, appear in early summer, and are followed by the fruit. Lemons which are formed in one season, however, will not ripen until the following year.

Lemons belong to the Citrus family, which include the orange, lime, and citron.

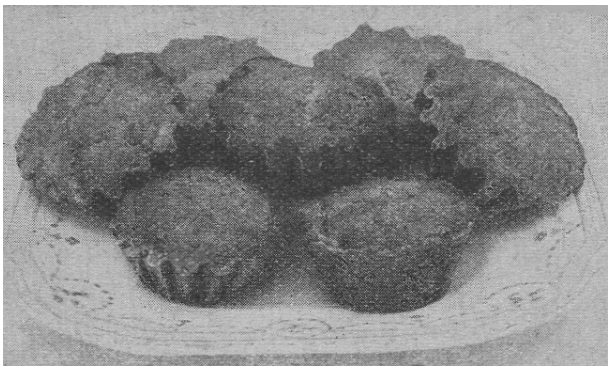
LEMON: In Cookery. A squeeze of lemon juice is an improvement to fried fish, to a dish of mince, or meat rissoles. It is preferred to vinegar by many for salad dressings. The juice is used to whiten various dishes as well as for flavouring, e.g. for ices or when mixed with icing, for cakes. It is also useful for softening the fibres of tough substances, thus making them more easily digested. Lemon is often substituted for milk or cream in tea. It is cut into thin slices, one being put into each cup of weak tea, sugar to taste being added. This is known as Russian tea. The juice of a lemon in a tumbler filled up with soda water and sweetened to taste is known as lemon squash.

From the rind, lemon essence, candied peel, and oil of lemons are prepared. The last-named is used both in cookery and scent making. The white pith below the rind is avoided in cooking, as it is very bitter. The rind should be pared very thinly or grated. In making custards and creams flavoured with lemon, the thinly pared rind should be added to the milk or cream preparation and brought to the boil. The rind is removed when the preparation is taken from the pan. In making lemon cakes or puddings the rind is usually grated. Slices of lemon cut across diagonally are used for garnishing cutlets, fried or boiled fish, veal, pancakes, and several made-up dishes.

To preserve lemons, smear them all over with the white or yolk of an egg and place them on a shelf to dry, or keep them in a jar of water, renewing the water daily. Another method is to put them under clean dry salt in a box, which must be kept in a cool, dry place. Lemon peel may be preserved if grated, put into bottles and covered with salt.

Many afternoon tea cakes, puddings and sweets are flavoured with lemon. This flavouring is also a favourite one for an icing (q.v.) for cakes and sponge sandwiches with various fillings.

Lemon Bun. To make lemon buns, allow ½ lb. flour to 3 oz. butter or margarine, 2 oz. castor sugar, 2 eggs, a teaspoonful of grated lemon rind, and a teaspoonful of baking-powder. Add the baking-powder and lemon rind to the flour, stirring them in lightly. Beat the butter and sugar to a smooth cream, gradually whisk into them 2 beaten eggs, and then fold in the flour, etc.



Lemon Buns, an acceptable addition to the afternoon tea-table.

If the eggs are small and the mixture seems too stiff, add a little milk to obtain the right consistency of a smooth batter. Grease some patty-tins and drop the mixture in, about two-thirds filling the tins. Bake them in a hot oven for about ten minutes. If liked, the buns can be covered with lemon icing when cold.

Lemon Cake. Lemon cake is made in the following way. Take 6 oz. flour, 4 oz. butter or margarine, 3 oz. castor sugar, 1 teaspoonful baking-powder, and 1 lemon. Beat the butter and sugar to a cream. Grate the lemon rind on to the butter and sugar, and stir in. Beat up the eggs very lightly. Add a little of the beaten egg to the butter and sugar, then a little of the flour, and whisk lightly with a fork. Continue beating in the eggs and flour alternately, and at the last add the juice of the lemon and then the baking-powder, which must be lightly stirred in but not beaten. Pour the mixture at once into a greased cake-tin and bake in a moderate oven for about one hour. Let the cake cool on a wire cake stand, and then ice it with lemon icing.

A lemon sandwich cake is made by preparing 2 thin rounds or quares of sponge, as described under jam sandwich (q.v.), and spreading them, while hot, with lemon cheese.

Lemon Cheese. This is made by beating well together in front of the fire 3 oz. fresh butter and ¾ lb. white sugar. When this is soft and melted, add the grated rind and strained juice of 2 lemons, and 4 or 5 new-laid eggs, well beaten, and mix them thoroughly. Stir the cheese over a slow fire until it is thick and creamy, but do not let it boil, then put it into small jars and tie down when cold. Keep it in a cool, dry place until needed. It is used as a preserve for sandwich filling or for open tarts and cheese cakes (q.v.).

Lemon Cordial. For this boil 1 lb. sugar and 1 pt. water together for 15 min. and leave to cool. Then mix 1 oz. citric acid with ½ dr. essence of lemon and add these to the syrup, which must be bottled for use. To a tumbler of hot or cold water add 1 or 2 tablespoonfuls.

Lemon Drops. *See* Acid Drops.

Lemon Pudding. An economical pudding that can be baked or steamed is made from ½ lb. flour, 6 oz. suet, 2 oz. breadcrumbs, 8 oz. castor sugar, 2 teaspoonfuls. baking-powder, 2 lemons, water to mix. Chop the suet and mix it with the breadcrumbs, flour and baking-powder. Add the juice of the lemons to a cupful of water for mixing. Mix the sugar with the grated rind of the lemons and add these to the dry ingredients. Mix all to a loose, moist consistency. Put into a greased pie-dish and bake for about an hour, or put into a greased pudding basin and steam for about two hours. Serve with a plain sweet sauce or a sauce flavoured with lemon if the pudding is steamed. If baked, sprinkle it with castor sugar.

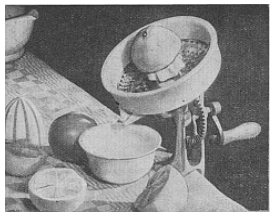
A different kind of lemon pudding is made in the following way. Line a pie-dish with puff paste. Mix 6 oz. bread or cake crumbs with 4 oz. castor sugar and a tablespoonful of grated lemon rind. Add 4 oz. butter or margarine and simmer all together for about 10 min. Put the mixture aside until it cools. Add the juice of 2 lemons and the beaten yolks of 2 eggs. Whisk the egg whites and add these at the last. Pour this mixture into the prepared pie-dish and bake for about 40 min. It should be served with cream and sugar or, as an alternative, a sweet sauce.

A very dainty lemon pudding is made by boiling the thinly pared rind of 2 lemons in 1½ pints milk until the peel is soft. Pound the peel with 4 oz. butter and pour the milk over ¼ lb. Savoy biscuits. Stir the butter into the mixture and add ¼ lb. castor sugar, the juice of 1 lemon and the yolks of 3 eggs well whisked. Pour the mixture into a buttered pie-dish and bake for about 40 min. Whisk the whites of the eggs to a stiff froth and pile roughly over the top of the pudding, sifting castor sugar, over the froth. Turn the oven to a slower heat and leave the pudding in for about 10 min., or until the froth is crisp and pale fawn in colour.

Lemon Sponge. This is made from 1 pint of water, 2 oz. castor sugar, 1 oz. gelatine, 2 lemons and 3 eggs. Pare the lemon rind very thinly, and mix it with the sugar and the strained juice of the lemons. Dissolve the gelatine in the water over gentle heat. When dissolved, strain the gelatine into another saucepan and add to it the sugar, grated lemon rind and lemon juice. Simmer for about 10 min., then place on one side to get quite cool. Separate the whites of the eggs and whisk them up very stiffly with a pinch of salt. Add these to the gelatine, etc., and whisk all together lightly. Pile in rough heaps on a dish or set in a mould rinsed out in cold water. Turn out when firm. The sponge should be kept in a cool place until required. If the sponge is served in a dish it should be garnished with crystallized cherries or violets and pieces of angelica.

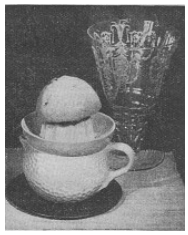
A lemon cream sponge is made thus. Add to a pint of cream the grated rind of a lemon and a little castor sugar and set it on the stove to heat slowly, but not to boil. Dissolve rather more than ½ oz. of gelatine in a little milk, stir it into the flavoured cream and set it aside to cool. Then add the juice of 1½ or 2 lemons,

and the beaten white of an egg, and whisk the whole until it is stiff.

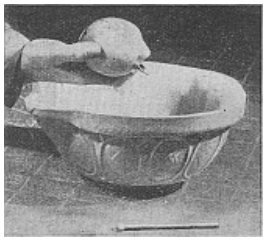


Lemon Squeezer which screws on the edge of the table. The handle rotates the centre piece and the juice drains into a basin.

Lemon Squeezer. This is designed for the purpose of expressing the juice of lemons without the admixture of pips or pulp. The simplest squeezer is of glass, formed like a pyramid with a channel round the base and a spout on one side. The half of the lemon should be pressed, cut side down, on the point of the pyramid, and as the pressure takes place the juice flows down the sides into the channel. These are obtainable in aluminium and glass. An improved kind has a glass cup beneath the squeezer, the base of which is perforated so that the expressed juice is collected in the cup, and several lemons can be squeezed in rotation and the juice is strained at the same time. A juice extractor which clamps on to the side of a table is the most convenient form of squeezer and strainer combined.



Lemon Squeezer in coloured pottery suitable for making lemonade at table. The top has holes through which the juice runs into the cup.



Lemon, Squeezer which is useful when only a few drops of the juice are required. A perforated aluminium tube is first pushed through the lemon, and withdrawn. The wooden pusher shown in the foreground is then used for removing the centre pith, and the perforated tube is again inserted, the juice straining through a few drops at a time. (Courtesy of Staines Equipment Co.)

LEMONADE. When making lemonade allow two good-sized lemons to a pint of water. The juice should be squeezed into a jug with a lemon squeezer, and about ¼ lb. of loaf sugar added. Pour on a pint of boiling water and stir until the sugar is dissolved. A little thinly pared lemon rind may be added, to be removed before the lemonade is served.

When the lemonade has cooled it should be strained and then more sugar can be added, if desired, and more water if it should be too strong. It should be put aside to get quite cold before being served. A stronger solution can be made by using double the quantity of lemons and sugar. The lemonade can then be diluted with water as required. For an effervescing drink ¼ teaspoonful of bicarbonate of soda should be added to a tumblerful of the beverage and stirred quickly in. *See* Glass.

LEMON GRASS. This is the common name of a hothouse grass, Andropogon schoenanthus. The leaves give off fragrance when pressed with the fingers. It thrives in a compost of loam, leaf-mould and sand, and is propagated by division of the tufts.

LEMON-SCENTED VERBENA. This favourite small shrub (Lippia citriodora) is valued for its fragrant leaves. It is not very hardy and needs the shelter of a greenhouse in most localities in winter. In mild districts it may be planted at the foot of a sunny wall where it will reach a height of 3 or 4 feet. It is propagated by cuttings in summer. Moderate pruning is necessary in spring.

LEMON SOLE. This is a kind of plaice somewhat resembling a Dover sole and occasionally called the sand sole. The flesh is not so plump, neither is it as firm as the true sole.

It is better not to attempt to broil or grill this fish, and it is not well adapted for being fried whole, but if skinned both sides and filleted it can then be egged and crumbed and fried in boiling fat.

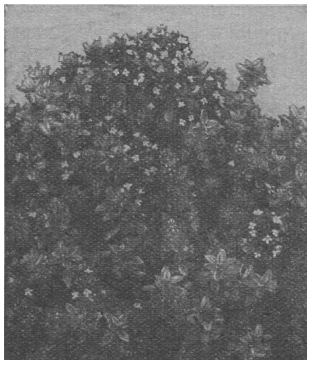
Fillets of lemon sole are also very good cooked with a stuffing and baked in a deep fireproof dish in the oven. The dish should be greased with butter, and the fillets, after being filled with stuffing, should be laid in it, seasoned and covered over with a buttered paper. About 15 min. will cook them and they will look white and creamy. Serve with a well-flavoured sauce poured over them.

Stuffing the Fish. The stuffing may consist of a plain veal forcemeat or it may be made with 6 mushrooms, chopped fine, 2 oz. butter or margarine beaten to a cream, 1 oz. fine breadcrumbs, a pinch of nutmeg, a teaspoonful of grated lemon rind, seasoning of pepper and salt, and 1 large egg to bind it. Heat this mixture until the egg is set, then cool it and lay a portion of it on one half of the fillet, fold the other half over and proceed in the same manner until all the fillets are stuffed.

Lemon sole fillets, stuffed or unstuffed, may also be baked with tomatoes, to which should be added 2 chopped shallots. They must be laid in a deep dish with 1 oz. butter, and with the tomatoes round them. Baste them while cooking with the liquor which runs from them, and keep them well covered with thick greased paper. When cooked, coat the fillets with fried crumbs and sprinkle over them grated cheese. Return to the oven for 2 or 3 min. to brown the cheese. Serve very hot. *See* Sole.

LEMON THYME. This is an attractive variety of the common thyme (Thymus serphyllum) named citriodorus. It has fragrant leaves and purplish pink flowers in early summer, but grows only 5 or 6 in., high. Propagation is by cuttings in summer; if set in sandy soil and covered with a handlight they will soon form roots. The golden-leaved (aureus) and silver-

leaved (argenteus) varieties colour well if they are planted in full sunshine in poor sandy soil.



Lemon Thyme, a fragrant garden plant.

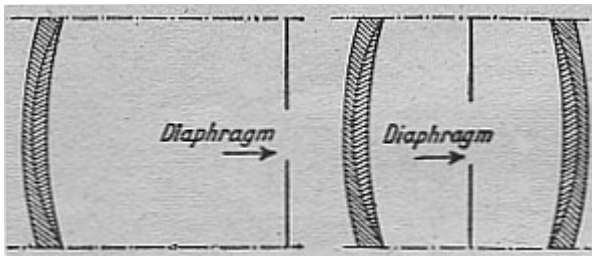
LENSES AND HOW TO CHOOSE THEM

An Important Consideration in Amateur Photography

A reference to the article on Camera is suggested by this contribution, which is another step in making our work an Encyclopedia of Photography. The reader is referred also to Developing; nlarging; F/Number; Focus; Photography; Stop, and other articles dealing with the subject.

The amateur photographer thinks when he sees a photograph which is sharp in detail all over and bright in appearance that it must have been taken with a very good and, therefore, expensive lens. This is quite a mistaken idea, for cheap lenses, used within their limitations, can give a picture which is sharp in every detail. The outstanding difference between a cheap and an expensive lens is its speed, that is, the length of exposure it requires. This factor is expressed in a figure representing the aperture of the lens, or its f/number. Thus a lens working at f/8 requires twice the length of exposure of a lens working at f/5.6 to give the same properly exposed negative.

Cheap cameras necessarily mean cheap lenses with comparatively small apertures f/8 or f/11, which can only be used for snapshots or so-called instantaneous photographs in the bright light of a summer day. All good types of cameras are supplied with various lenses, according to the desire of the purchaser, so that the price of a particular camera may vary with the lens with which it is fitted. The idea that special lenses are required for different kinds of photographic work may be dismissed entirely, with the partial exception of portraiture; any good modern lens will meet all the requirements of the amateur photographer.



Lens. Fig. 1 (left). Diagram of simple achromatic lens. Fig. 2 (right). Rapid rectilinear for symmetrical lens, which gives better definition.

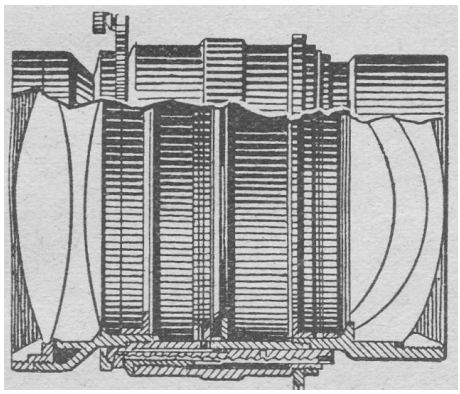


Fig. 3. Sectional diagram of modern fast anastigmatic lens (Zeiss).

There are three main types of lenses used in photographic work. The simple colour-corrected or achromatic meniscus lens, the rapid rectilinear lens, and the varieties of anastigmatic lenses. The simple achromatic meniscus lens type is seen in section in Fig. 1, in which two meniscus lenses, one of ground glass and one of flint glass, are cemented together. This type gives good definition if it is stopped down to about f/16 or f/ll. The whole of the lens cannot be used, because definition is lost towards the edges. The rapid rectilinear, sometimes called symmetrical, shown in diagram Fig. 2, is a great improvement and gives good definition without distortion at f/8, though its definition at this aperture is not equal to that of an anastigmatic lens of equal aperture.

The chief points about an anastigmatic, one type of which is seen in diagrammatic form in Fig 3, are that without being stopped down definition is perfect over the whole of the plate which they are designed to cover, and also that they are much faster than meniscus or R.R. Lenses.

Having obtained a good lens, the amateur may be disappointed to find at first that he does not get as good results, from the point of view of definition, as he did with his cheap, probably fixed-focus lens. The reason is that the modern lens is an instrument of precision, and accordingly needs knowledge for handling it to the best advantage. With his fixed-focus lens in a box-form camera all objects from 2 or 3 ft. away up to the farthest possible distance, called infinity, were automatically in focus, and no question of focussing arose. With the anastigmatic lens, on the other hand, the greater the aperture and the focal length the shallower is the field of focus.

From one point of view this may be regarded as a disadvantage attaching to the speed of a lens, but in practice it will be found that at least with a moderately large aperture, say f/6 or f/5.6, more artistic and pleasing results will be obtained. So long as objects in the foreground of a picture are not blurred or fuzzy, those in the distance may be softened by being slightly out of focus.

It is largely a question of understanding the capacities and limitations of a particular lens in use and practice in its accurate focussing; the wider the aperture and the shallower the field of focus the greater the necessity for care in focussing.

Two other questions which arise in the choice and use of a lens are its focal length and its angle of vision.

In the average lens short focus means a wide angle giving a large field of vision on the plate, while a long focus means a narrow-angle lens giving a smaller field of vision on the plate with detail on a larger scale. A lens of short focal length and wide angle throws a larger amount of the object on to the plate than one of long focus; that is, it covers a wider field and reproduces it in smaller detail. On the other hand, a lens of long focus and narrow angle (as in telephoto work), covers a smaller part of the field, does not focus the object until it is farther away from the plate than the short focus lens, and gives detail on a larger scale.

Not only has this the advantage of getting objects in comparatively large scale, although the camera is at some distance from the object being photographed, but it has the very valuable property of giving much truer perspective than the wide-angle lens. The familiar case of the amateur portrait in which the hands are larger than the rest of the sitter's body is an exposition of the disadvantages of the wide-angle lens. Again, the wideangle lens sees more than the human eyes at one glance, and consequently the photograph given by it seems to lack actuality.

On the other hand, it will sometimes happen that a building or other object is to be photographed in a street or confined quarters where it is impossible to get far enough away to focus a narrow-angle long-focus lens. In such a case a wide-angle short-focus lens must be used. In earlier days photographers carried a complete selection of lenses of different angles and types to meet such circumstances. With the modern lens, however, this is overcome, either by adding temporarily an extra lens to shorten the focus, or, more satisfactorily, by making the lens convertible.

This means that the lens is so designed that either of the two principal components seen in Fig. 3 may be used as a separate lens. Thus the complete lens may have a focal length of 5½ in. for a quarter-plate camera. If the back portion alone is used the focal length will be, say, 8 in., while if the front portion alone is used the focal length may be 11 in. We have thus three lenses in one, each of which is a good anastigmat. Of course, if the complete lens works at f/6 the back and front components will probably only be equal to f/11 and f/16 when used separately.

To use a convertible lens it is essential that the camera front should be capable of being racked out twice the distance normally required.

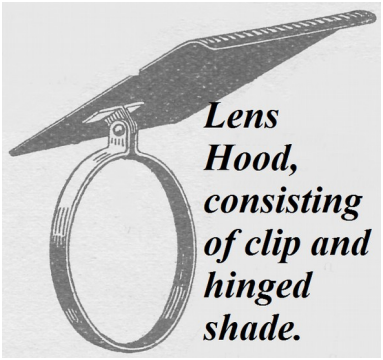
If a convertible lens cannot be acquired a sound rule in choosing a lens for general photographic work is to select one whose focal lengths equals the diagonal of the plate it is to be used with. For colour and speed work an extra large aperture is desirable. In the modern miniature camera the very small lens has a considerable depth of field even at large apertures. Thus, the miniature lens will be f/3.5 as against f/6 in the ordinary camera.

For the best results in portrait work, specially large lenses are designed with considerable focal length, so that the camera may be a good distance away from the sitter. The aperture in some cases is as large as f/1.5, f/2 or f/3, with a focal length of 16 or 17 in. for a whole-plate camera.

Camera lenses should be kept free from dirt and damp, and when not in use they should always be covered up. Under no circumstances should they be cleaned with anything but a camel-hair brush, special lens paper, or a piece of old, well-washed, soft linen. Lenses are easily scratched, and while a scratch will not be visible in a photograph, yet several scratches will reduce the amount of light which passes through the lens, and in bad cases will impair the definition. Of course no polishing substance of any kind whatever should be used. In the special kind of glass used in making modern anastigmatic lenses small bubbles will sometimes be observed; these are unavoidable in the manufacture of the glass and have no effect on the brilliancy or definition of the lens.

The Lens Hood. In the modern folding hand camera it is rarely possible to provide any shade or hood of considerable size for the lens, owing to the lack of space. The result is that on bright days a certain amount of light from the sky enters the lens beyond that which comes from the object or scene being photographed. This light tends to be scattered over the negative and reduces the brilliancy of the picture, the negative being, in fact, more or less fogged.

Much more brilliant photographs will be obtained by the use of a sky shade or hood for the lens. The simplest form is a piece of thin card about 2½ in. long by 1 ¼ in. wide, coated with a dead black varnish. It is held in place on the top of the lens by means of an elastic band. A black card is not sufficient, as its slightly shiny surface reflects back the light.



Lens Hood, consisting of clip and hinged shade.

Another form consists of a stiff wire frame fixed to the lens mount at an angle and arranged to fold down when the camera is folded up. Over the frame is draped a small piece of black cloth. A third form consists of a clip which fits the lens flange with a metal shade hinged as shown in the diagram. It should be treated with dead black.

When a shade is fitted it is essential to test it to see that no direct light is cut off from the lens. This can be effected by focussing on a near object and examining the image on the focussing screen. See that there are no dark shadows at the bottom of the focussing screen. If no focussing screen is fitted to the camera, a test exposure should be made.

LENTEN ROSE. There are some beautiful flowers among the varieties of Lenten rose (Helleborus orientalis), a hardy herbaceous perennial, 12 to 18 inches high, which blooms in spring. The plants like

partial shade and loamy soil with which decayed manure has been mixed. A few of the finest varieties are Isolde, rose; Queen of the North, blush-white; and Robert Froebel, reddish crimson. It is unwise to disturb the plants unnecessarily, but propagation may be effected by lifting and dividing the clumps when the flowers are over.

LENTIL. The lentil is a hardy annual bean, the seeds of which may be sown in sunny borders in April in rows about 1 ft. or 18 in apart. They should be put in about 2 in. deep and the same distance apart. The flowers appear in June and July. After flowering the tiny seed pods, about 1 in. in length by ½ in. wide, are formed. Each of these contains two seeds. The plants should be left in the ground until they are yellow. They should then be pulled up, thoroughly dried in the sun, and the pods stripped off and stored in a dry place.

How to Cook. Largely used in vegetarian cookery because they possess all the strengthening qualities of meat, lentils sometimes take the place of a second vegetable, and are also made into soup or used as the foundation of side dishes. Lentils should not, however, be served as a vegetable in the case of a heavy meat dinner, but rather when the meat course is scanty.

The Egyptian red lentil is used most commonly; it requires soaking overnight, and must be thoroughly washed and picked over in the morning, all pieces of black being removed. If to be served as a vegetable, boil it in plenty of salted water with an onion peeled and cut in strips. Add a little dripping or some other fat and boil for 1½ hours. It is better to cook lentils a little too long than not enough. When done, drain the water away and add another 2 oz. of dripping. Season well and mix in the fat thoroughly by stirring over the fire. Serve with chopped parsley sprinkled over.

Lentils may also be served with bacon, and in this way make a good supper dish. To prepare this, cook the lentils according to the directions given in the previous recipe, and, just before they are ready to be drained and dished, fry 3 oz. streaky bacon and cut it into dice. Dish the lentils and bacon together, and serve with them ½ pint of any good brown sauce and a few sippets of toast or fried bread.

Lentil Soup. One pint of red lentils, soaked overnight, are required to make lentil soup. Prepare it by melting 2 oz. butter in a saucepan, adding the lentils, a sliced onion, 2 sticks of celery cut into small lengths, and a bunch of herbs, stirring the whole over the fire for 5 min. Pour in 2 quarts of stock and boil the soup until the lentils are soft; then take out the herbs and rub the soup through a fine sieve. Reboil it, season it carefully, and then add 1 gill of cooked peas and 2 oz. cooked ham cut into dice, if liked. Serve the soup in a hot tureen, shaking in some powdered mint. This quantity is sufficient for about 8 persons. *See* Soup; Vegetarian Cookery.

Lent Lily. This is the popular name of the wild daffodil(q.v.)(narcissus pseudo-narcissus)

LEOPARD MOTH. Also known as the wood leopard moth, this is a long-bodied insect bearing white wings with black spots. Its larvae penetrate the interior of the branches and trunks of apple, pear, and plum trees, besides several other ornamental trees.

The presence of larvae in trees may be detected by holes, but owing to the extensive turnings and galleries bored it is difficult to get at the pests. The only remedies are to push a hot wire in the burrow with the hope of killing the caterpillar, or to squirt carbolic acid or paraffin emulsion into the holes. Where the injury is confined to a single branch this should at once be removed, if the above remedies fail.

LEOPARD'S BANE. This is the common name of doronicum, a hardy herbaceous plant 12 to 24 in. high. It bears large, yellow, daisy-like flowers in spring and will flourish on a shady border. It thrives in ordinary soil and is easily increased by division in September. The finest of all is Doronicum plantagineum excelsum (Harpur Crewe), with long-stemmed blooms which are most useful for cutting.

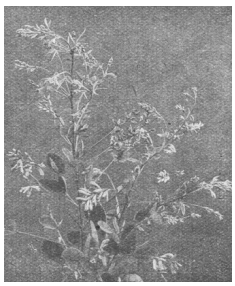


Leopard's Bane. Long - stemmed yellow flowers of doronicum.

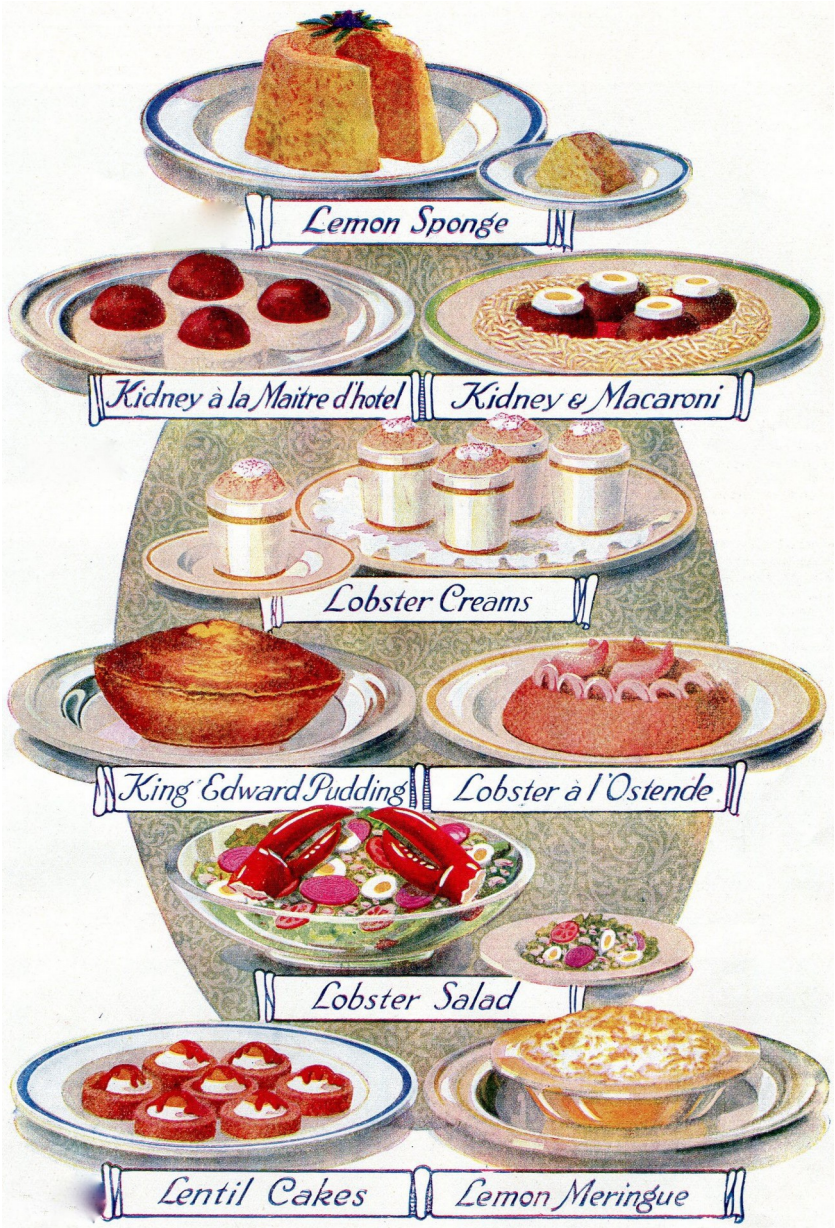
LEPTOSIPHON. This pretty, hardy annual, 6 to 8 in. high, is useful as a flower border edging or in the rock garden. A mixed packet of seeds will yield flowers in rose, yellow and other colours. Seeds are sown out of doors in April where the plants will bloom in summer.

LESCHENAULTIA. This family of Australian evergreen greenhouse shrubs is in bloom from June till September. They thrive best in peat and sand in a sunny glasshouse, and like plenty of ventilation in fine weather.

LESPEDEZA. This is a Japanese shrub, 4-5 ft. high, which has attractive pinnate leaves and bears purplish pea-shaped flowers in early autumn. It is suitable only for planting in mild districts. The branches should be hard pruned in spring. Propagation is by sowing seeds or by division of the root-stock in spring.



Lespedeza. Leaves and clusters of pea-like purple flowers of this hardy shrub for a sunny border.



'K' AND 'L' RECIPES: A SELECTION SHOWN IN COLOUR

King Edward Pudding. Take 2 eggs, and their weight in flour, margarine and sugar. Cream margarine and sugar together, add beaten yolks and beat for a few minutes. Stir in flour, a level teaspoonful of baking powder, 1 tablespoonful milk, and flavour with vanilla. Add whites of eggs, turn mixture into greased pie-dish and bake in moderately hot oven for 1 hr. Serve with hot jam or golden syrup. Lobster à l'Ostende. Remove flesh from shell and cut into fairly large squares, except that from claws, which should be kept unbroken. Melt 1 oz. butter, stir in smoothly ½ oz. flour; add ½ pt. Fish stock or milk, and stir until it boils. Put in 3 tablespoonfuls boiled rice, then the lobster, 6 shelled prawns. 1 teaspoonful anchovy essence, 2 tablespoonfuls tomato sauce. Heat mixture thoroughly, season and arrange on dish, garnishing with meat from claws and a few prawns. Lemon Meringue. Boil together 1 pt. hot water, 2 heaped tablespoonfuls castor sugar, and grated rind and juice of two lemons. When boiling, stir in 3 tablespoonfuls cornflour previously blended with a little cold water. Cook all gently for 5 min. When slightly cooled add well-beaten yolks of 2 eggs. Continue cooking without boiling for a few minutes. Turn into greased pie-dish. Heap the stiffly-whipped whites on top, sweetened and vanilla-flavoured, and bake in slow oven until a pale biscuit tint.

LETTER: How to Write. There are a number of formal matters which those who wish to write a good letter should know. The writer should see, first of all, that his own correct address and also the correct date are stated at the top of the letter. If there has been a change in the address, whether temporary or permanent, and the existing paper is still used, the new address should replace the old one; if it is a temporary one it would be well to add the date at which it will cease.

Methods of Address. The method of addressing the person written to varies according to the degree of intimacy. For persons of rank there are recognized forms of address, but relatives and intimate friends will discard these. For letters on business matters the usual opening is Dear Sir if to an individual, or Gentlemen or Dear Sirs if to a firm. As regards others, there can be no hard and fast rule, as so much depends upon the personal element. It is well, however, not to take a familiar tone with persons who are only acquaintances or with those, not intimate friends, who are of high social position. The phrase, My dear, suggests an intimacy not present in the ceremonial Dear.

The subscription to a letter also takes many forms. Persons use yours truly and yours faithfully indifferently; yours affectionately implies a close personal relationship, while yours respectfully and yours obediently suggest a request or a formal letter to a superior. Yours sincerely or yours very sincerely is the subscription most commonly used to acquaintances or friends.

If a letter is an answer to one received, the correct date of the latter should always be given when replying to it. If to-day or to-morrow is mentioned, the day of the week should be added; otherwise a person may be in doubt whether it refers to the day on which the letter was written or the one on which it was received. If a day is mentioned it is well to add the date again in order to avoid a possible confusion. It is a good plan to read a letter over carefully after it has been written; this will prevent mistakes due to hasty writing, such as, for example, the omission of the important little word not.

Formal and Ceremonial Letters. Convention or etiquette decrees that letters shall be written to friends, and in some cases to acquaintances, on certain special occasions. Letters of condolence are written to the relatives— generally to the nearest—of a dead person. Letters of congratulation are written to persons who have received some honour or appointment; to persons whose engagement is announced, and on other occasions of rejoicing, such as the celebration of a silver wedding or a birthday. It is also customary to write a letter of thanks to one's hostess after a stay in her house.

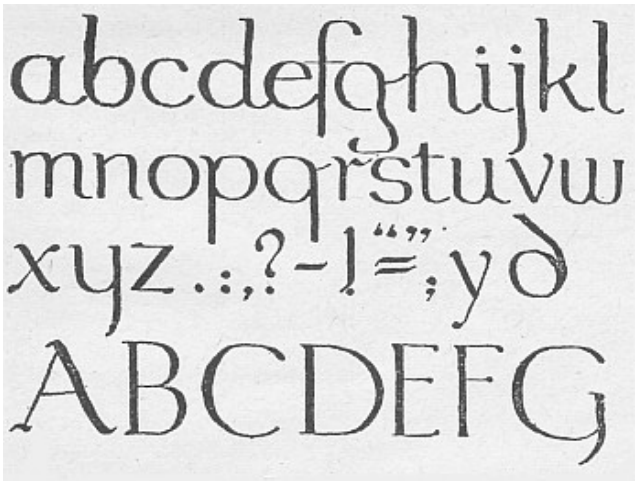
When writing to a stranger, perhaps one who has asked for the character of a maid, some persons write in the third person. This kind of letter has the advantage that it need not contain expressions of friendship, which seem incongruous in the case of a stranger, nor be signed. Care should be taken, the third person is maintained throughout the letter. *See* Ink; Notepaper.

The Letter Case. This is a case for holding envelopes, writing paper, blotting paper, pens, and all the necessaries for writing letters. The covers are usually of leather, or one of its imitations, and can be fastened by a flap, made safe by a lock or snap, or both. *See* Leather.

LETTERING. There are so many uses for lettering in the home that a knowledge of the various styles will be useful. Good letters must be readable, simple, and distinct. They must be proportionate and pleasing in form, and suited to the purpose for which they are employed.



Lettering. Figs. 1 and 2. Line and block letters. Figs, and 4. Capitals in Gothic and Old English styles.



Lettering. Fig. 5. Small letters, some capitals and punctuation marks of a simple but decorative form of lettering.

The Roman alphabet is the basis of all lettering. The simplest form is the line letter illustrated at Fig. 1; the proportions are the same as in Roman, but it is drawn with fine strokes of the pen or pencil. A development of this style is the block letter shown at Fig. 2; this may be done with a wide pen-nib or outlined and filled in with ink or colour. Decorative letters suitable for various purposes are the Gothic and the Old English, shown at Figs. 3 and 4. For letters over ½ in. high, a reed or cane pen is most suitable, but smaller work can be done with a quill or one of the steel pen-nibs sold for the purpose.

Preliminary practice will soon enable the writer to

form the simple strokes. He should commence with glazed paper, and with a pencil rule faint guiding lines. The paper should be supported on a board at about an angle of 45°, and the ink should be applied to the pen by a brush rather than the pen dipped into it. The pen should be held lightly and horizontally to the paper, with the nib always in contact with the paper. Thick strokes are vertical, thin strokes are horizontal.

The correct spacing of half-uncials, as the small letters are called, is important; as a general rule two curved letters should be close together and two straight strokes spaced well apart. The space between words should be exactly equal to the height of the letter. In massed writing the usual distance apart of the writing lines is three times the height of the letter o, and the up and down strokes of the small letters are, with the exception of t, twice the height of the o. The uncials, or capital letters, should not be coupled together when forming words, and while their height should be twice that of the o, the spacing may be wider apart. To acquire proficiency, it is advisable to commence with letters about ⅜ in. high and gradually reduce to about 3/16 in., and always work to ruled lines. Indian ink should be used in preference to any other.

The Roman capital is distinguishable from the line and block letters by the endings of the strokes, known as serifs; the thin stroke should, as a rule, be ¼ the width of the thick stroke, and the latter about ⅛ of the height. It is equally as effective drawn in outline as filled in. The letters A, C, D, G, H, N, O, Q, R, and T are about the same width as height.

E, F, K, P, U, V, X, Y, and Z are slightly narrower; B, L, and S are much narrower, and M and W wider. The same proportion applies to line letters, but block letters have, as a general rule, more or less the same width as they have height.

Dealing with the suitability of letters for various purposes, the line letter should be used for marking ink on household linen and clothes, but if the name is stitched the block letter is more effective. Small notices, menu cards, and programmes look well if uncials and half-uncials are used. The use of margins should be considered in spacing out lettering in this connexion.

Preparing Labels. Labels used for boxes, bottles, canisters, and other purposes should be in block lettering. A special pen is made to enable a thick line of ink to be drawn on labels and parcels, but a good substitute will be found in a camel-hair brush with the pointed end cut off or one of the flat bristle brushes used in oil painting. Large notices may be done in the same way, but it is advisable to use thick ink or water-colour paint. Trunks and other travelling cases should be painted in block lettering with Brunswick black or paint mixed with varnish. Roman letters are suitable, but look better when painted on attaché cases, and lend themselves to brushwork better than any other form.

Cutting Stencils. For cutting stencils it is customary to use block letters with properly situated ties to hold the metal together. Incised letters in wood and stone are usually executed in Roman type; it is not a difficult matter to cut capitals in hardwood with a veining tool. The letters should be drawn in pencil or ink direct, or they may be traced on with carbon paper and then cut as far as possible against the grain. It is essential that the veiner employed in making the V cut is kept perfectly sharp in order to leave clean edges; the correct depth and width should be tooled in one cut, not worked out bit by bit. *See* Drawing; Stencilling.

LETTER PLATE. A metal framework with a hinged flap is used for closing an aperture in a door through which letters can be delivered, and is known as a letter plate. A usual variety is made of cast iron and painted with Berlin black, or coloured. Better qualities are made in polished and lacquered brass either plain or ornamental.

The letter plate should be chosen with regard to the appearance of the front door or to the entrance of the house, and the design should harmonize with the metal fittings of the door. Usually the flap is hung on two pivot bearings, and it is shut by means of a small coil spring. To ensure the flap working smoothly the bearings should be oiled occasionally, and if necessary the tension of the spring increased by unfastening one end, giving it another turn, and then refixing it. *See* Door.

LETTERS: Games With. Collections of letters with which a variety of games are played can be bought or made at home. Bristol board, or any thin cardboard with a smooth surface, may be used. Squares are cut to any size required, the most usual being about ¾ in. square, but the actual size is immaterial if all the letters are uniform. They should be Roman capitals, done either in ordinary black ink or in Indian ink, and though the number required for each letter varies with the size of the set, the following may be taken as a useful proportion for a small set. There should be at least 25 of each vowel, and preferably 30 for A and E; most of the consonants need 20, but Q and Z can be cut down to 5, and X and Y to 10. D, N, P, R and S may very well have 25. A set made round about these figures should keep four players amused for a considerable time.

The games played with these letters are very numerous. Word making and word taking may be mentioned first. Rules and directions are sold with every box of letters purchased. Another game is for each player to draw a given number of letters, say 30, and with those to make as many words as possible in a fixed time. The letters must be well shaken up before drawing.

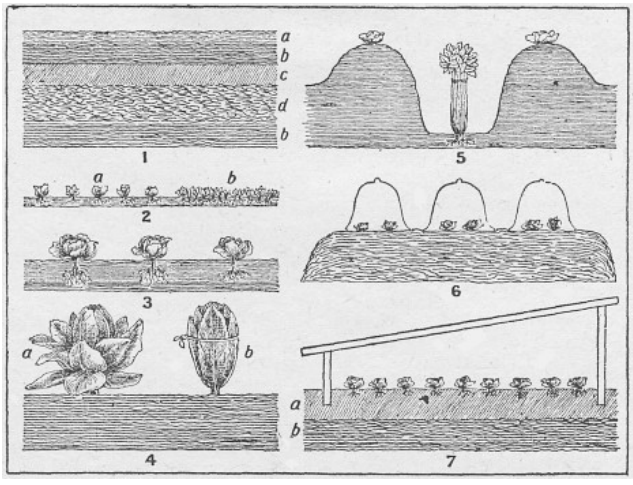
The players may be given letters forming one polysyllabic word, such as incomprehensible, and be told to form as many other words as possible using only those letters. It is usual to stipulate that no word must contain less than three letters. Another variant is to have the letters piled up in a heap in the middle of the

table, while the players turn them over at their will, making as many words as possible in a given time. The rule mentioned above holds good in this game also, and plural and singular are not allowed as separate words.

Another form of letter game is the adjective letter, in which a letter is written with all the adjectives omitted. Only the writer knows its contents, but the players are then asked to suggest adjectives in turn, each of which is filled in by the writer in the order chosen. As the adjectives are chosen haphazard by a number of players, the result, when the letter is read aloud at the end, is always amusing by its incongruity. If possible the letter should be written before the guests arrive.

LETTUCE. This favourite salad plant is grown chiefly for summer supplies in the average garden, but it can be obtained in spring, summer and autumn by making successional sowings out of doors and under glass. Lettuce must be grown on rich soil and during dry weather needs watering very freely. There are two types, the tall upright cos, and the flattish cabbage lettuce, and numerous varieties of each type. The cabbage lettuces are grown largely for late and early supplies and the cos lettuces for summer: the latter are more difficult to grow really well than the cabbage lettuces and should not be attempted on poor soil.

The first sowing out of doors should be made in March or early April as soon as weather and soil conditions allow of the seed being sown. The drills should be 12 in. apart. It is most necessary to thin out the seedlings before they become crowded; if necessary some of them may be transplanted to form fresh rows which will be ready later.



Lettuce. How to grow them successfully. 1. Correct soil preparation: a, fine soil; b, soil; c, manure; d, vegetable refuse. 2. When thinning, a, shows correct distance apart; b, too crowded. 8. Result of good thinning. 4. Growing cos lettuces: a, neglected plant; b, plant with leaves tied round to blanch the heart. 5. Catch crops on celery ridges. 6. Forcing under cloches on hotbeds. 7. How to grow for spring supplies: a, fine soil; b, soil.

Successional sowings are made in May and June to meet requirements. As lettuces are only palatable when fresh it is preferable to sow a short row every fortnight than to make several large sowings. Lettuce is often grown as a catch crop between rows of peas, on the ridges of celery trenches, or in parts of the kitchen garden where room can be found among other crops.

Seeds sown out of doors in July will provide lettuces in autumn, and for winter and spring supplies seeds are sown in August and September, the plants being lifted and set in a bed of soil in a frame in the autumn. Some of them may be planted on a warm sheltered border in March if protection can be given in cold weather. A further sowing in a heated glasshouse in early spring will provide seedlings for planting out in March.

A few of the best cabbage lettuces are Hercules, Wonderful, Continuity, Commodore Nutt, Standwell and Ideal. Favourite cos lettuces are Superb White, Exhibition Cos and Jumbo. Varieties most suitable for sowing in August and September are (of cos lettuce) Black Seeded Bath, Winter White, Hick's Hardy White, and Brown Cos. Of cabbage lettuces for autumn sowing Hammersmith and All the Year Round are favourites.

Pests of the Plant. One of the chief pests to guard against is the lettuce fly, a brownish-black insect with black wings, which lays its eggs in the blossoms and interstices of the lettuce in early summer. The effective remedy is to uproot infested plants and burn them. The lettuce-root aphis cannot be discovered until the plant begins to fade and droop. Usually a lot of cottony looking insects will be found to be clustered about the roots. The bad plants should be at once destroyed, and the lettuce patch treated to a dressing of lime. The other chief pest is caterpillars.

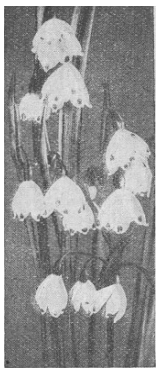
The cabbage lettuce is in season earlier than the cos, and is more delicate in texture and flavour. It is, therefore, more suitable for salads; for other purposes of cookery the cos lettuce is the kind preferred.

Preparing for the Table. Lettuce is valued by cooks as a foundation for salads. It must be thoroughly cleansed before use, and all leaves carefully looked over, in case insects should be lurking in them. When preparing a salad lay the lettuce in water to freshen, then sprinkle it with salt and leave it for an hour or two; wash it in two or three waters, shake well, and lay it on a hair sieve or a piece of clean cloth to drain.

Lettuce may be made into a stew. Tie together a large cos lettuce after preparing it, and boil it for 5 min., cool it, part it in the centre and fill with a good forcemeat. Tie it together again and braise it gently on a bed of vegetables with good stock for 20 min. Dish the lettuce, strain the gravy, reduce it by boiling, skim and pour over the lettuce. The stuffing may be omitted, but the gravy must then be thickened and flavoured with Worcester sauce and lemon juice. *See* Salad.

LEUCOJUM. This is the name of a group of spring and early summer-flowering bulbs. The best known are the spring snowflake (vernum), 6-7 in., which bears white, greentipped flowers in April, and

the summer snowflake (aestivum), 18 in., which has white flowers in May. The bulbs should be planted in autumn and left undisturbed; they thrive in ordinary well-drained soil. An increased stock can be raised by means of offsets taken off the bulbs when the leaves have died down or in autumn.



Leucojum. Drooping white and green flowers of the spring snowflake.

LEUCORRHOEA. A discharge from the vagina commonly called whites is termed in medicine leucorrhoea. It occurs most frequently in women who have borne children, but is also found in children and unmarried women.

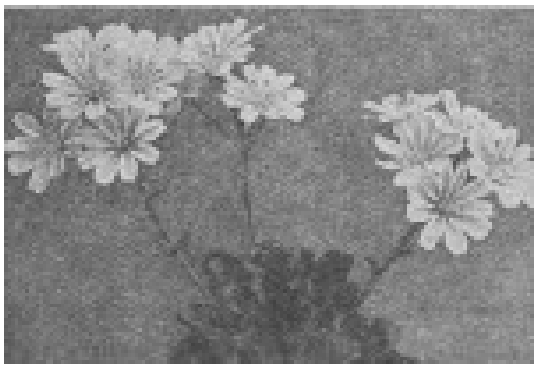
Infection by microbes is the most common cause amongst children, aggravated often by want of cleanliness. Threadworms sometimes produce a discharge both in very young and older girls. The parts should be washed four or five times a day with warm water and an antiseptic lotion applied, such as a weak solution of permanganate of potash.

Leucorrhoea may occur in young women who work in close, badly ventilated rooms or stand a great deal. It is very common in anaemia and chronic constipation. Married women often make the mistake of not consulting their doctor early enough. The cause may be inflammation following childbirth. Attention must be directed to the general health, and the doctor may order an astringent or antiseptic douche. The patient should take no alcohol, and tea only in moderation. Sufficient rest is often of importance.

LEVER: In the Home. In the domestic sense a lever may be considered as a rod or bar which can be inserted under or behind an object in such a manner that it is possible to prize it along, or to force it from its position. In most cases the word lever is employed in order to indicate some rodlike part of a machine which is provided in order to obtain a mechanical advantage.

Supposing that the fulcrum, or that part about which the lever turns, is so placed that one part of the lever is four times as long as the other. Four times the pressure exerted at the long end is imparted by the short end, but the long end will travel four times the distance of the short end. When a bent lever has one arm which is jointed to another portion of the mechanism by means of a pin somewhere near a right-angle corner, it is known as a bell-crank and will then transmit motion from one point to another at right angles to it. *See* Handspike.

LEWISIA. This describes a group of rockery plants having fleshy leaves and summer flowers of various colours. They need rather special treatment and should be planted in full sunshine in well drained soil of peat, loam and sand. They must be protected from wet in winter by glass fixed a few inches above them on wires. Howellii, rose pink, and Tweedyi, salmon rose, are two of the best varieties of the plant.



Lewisia in bloom, with rosette-like cluster of leaves.

LEYCESTERIA. This is an attractive hardy flowering shrub, also called the pheasant berry. It thrives in ordinary soil, grows 3-4 ft. high and in summer bears red bracts and cream coloured flowers, which are followed by black fruits. It is not recommended for planting in cold districts. Propagation of the leycesteria is by cuttings in autumn. Pruning takes the form of thinning out weak or crowded branches in spring.

LHASA TERRIER. Some specimens of this small, rough-haired dog, found in Bhutan, and other hill countries adjacent to Tibet, have been imported into England. They have engaging manners which make them pleasing pets. The body is covered with a profusion of soft, shaggy hair, and the plumed tail is carried over the back, as with the Pekingese. The legs should be straight and short, and the colour white and black, silver, grey, or coffee-coloured. *See* Dog.

LIBEL. Libel is both a civil wrong, giving rise to an action for damages by the person libelled, and a criminal offence. Seditious libel and blasphemous libel are criminal only. The one consists of publishing words calculated to bring about discontent against the king's government or the king; and the other of writing against religion in an irreverent and indecent manner.

LIBERTIA. In gardens only three species of the hardy evergreen perennial libertia are generally found. L. formosa, with its slender, grass-like leaves, height about 18 in., bears some resemblance to the iris. It retains its freshness throughout the winter if grown in a sheltered, sunny place, and in light, sandy loam, peat and loam, or other friable soil. The white flowers appear in May. Grandiflora and ixioides are taller plants and flower rather later; both are white. They reach a height of from 2 to 3 ft. The plants may be separated into pieces and replanted in spring, or seeds can be sown in the autumn in a frame.

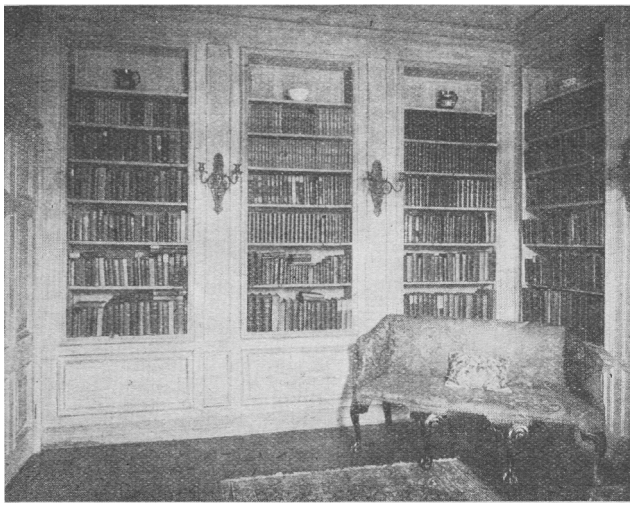
LIBOCEDRUS. Name given to certain evergreen conifers. The most generally useful is Libocedrus decurrens, a magnificent tree of narrow, upright,

columnar growth which will reach a height of 40 to 50 ft. in time. It likes deep, moist, loamy soil and makes a splendid lawn tree.

LIBRARY: How to Furnish. There is no room more conventional in its furnishing than the library. Its model comes down from the 18th century as preserved in many country and town houses. Decorative schemes are simple and dignified. The books in themselves form ample variations in colour. In a small room the shelves may reach to the ceiling, but in a more spacious library panelled walls are in keeping with the period of the original model and look particularly well in natural coloured wood, wax polished. The same wood is used for the bookcases and parquet for the floor.

It is important in a library to prevent the accumulation of dust; for this reason there should be either rugs on the floor or the carpet must not come to the edge of the room. The surround should allow a space of at least 1½ ft. from the bookcases.

The conventional desk or bureau is a necessity, but it is useful to have in addition a substantial table placed in a good light on which work can be spread out. This table is all the more useful if it is provided with drawers. Large makes of book tables are also appropriate, since they are composed of several tiers divided into sections which hold journals, magazines and reference works, besides books in use taken from the wall shelves.



Library. Corner of room modelled on the conventional form of the 18th century, with recessed bookshelves and walls in panelled wood stripped and wax polished. The girandole lighting fixtures, graceful settee and oriental rug enhance the period decoration. (Humphrey & Vera Joel)

Any bureau or writing table must be placed so that the light falls from the left-hand side. A good reading lamp is essential; several should be provided if the room is to be used by more than one person habitually. Convenient wall lighting fixtures, and, for a large room, a central ceiling fitting are also advisable. Velvet in a rich yet quiet shade is particularly suitable for the curtains and upholstery of a library, with a comfortable leather armchair or two. Heating arrange-ments must also be well thought out in order to maintain a pleasantly equable temperature, which is important not only for the occupants of the room, but also for the preservation of the books. A tapestry panel, one or two bronzes or good pieces of pottery, a handsome writing desk set, are suitable in a library, but anything superfluous or merely pretty seems out of place.

Care of Books. Built-in bookshelves are usually open. Sectional bookcases sometimes line one wall, for such volumes as are better kept behind glass. If the shelves reach to the ceiling library steps will be necessary. Dummy backs of books on simulated shelves are sometimes used to cover the doors of the cupboards or of the room so that the line of the bookshelves may be unbroken. This is an old form of interior decoration which has been revived in present day libraries.

Books require careful handling, especially under modern conditions, when bindings are less robust than formerly. A feather brush thoroughly used once a week will keep them reasonably clean, if pamphlets and other unbound books are placed in folders properly labelled, a supply of which can easily be made at home. Once a month a methodically arranged cleaning is necessary. A vacuum cleaner is best for the purpose, but if this is not available the books must be taken out and the books and shelves thoroughly dusted. At spring and autumn cleaning a real overhauling must be undertaken, when books which are no longer useful can be weeded out, and those which are in need of rebinding can receive attention. *See* Bookcase; Bureau; Writing Table.

LICE: How to Remove. There are three forms of lice, the head louse, the body louse, and the crab louse. They lay many eggs per week, and these nits mature in about ten days. Applications which destroy the lice may have no effect on the eggs. There is itching, sometimes intense, of the parts affected, which may be the seat of eczema. Treatment of infestation with head lice is dealt with in the article Hair (q.v.).

Body lice live in the folds and creases of the clothing. A warm bath, followed by rubbing in sulphur ointment for several days, will cleanse the body of any eggs that may adhere. The underclothing and bed linen should be boiled. The outer clothes are to be ironed on the inside with a hot iron.

Crab lice most commonly infest the hair in the pubic region, but sometimes they attack the armpits and chest, and may reach even to the beard and eyebrows. For this variety rub into the hair and the neighbouring parts equal parts of white precipitate ointment and vaseline. Or use the following application:

Beta-naphthol	1 dram
Cologne water	6 oz.

Make into a lotion. Sop on to the affected parts twice daily. *See* Disinfection.

LICENCE. In Great Britain the owners of firearms, motor cars, motor cycles, dogs and guns, and users of armorial bearings, are taxed on them, the tax taking the forn of a yearly payment for a licence. Licences are usually taken out at a post office, and fines are inflicted if the articles in question are owned or used without a licence, which must be shown to the police if required.

In England, one of the ways of getting married is by licence.

A licence must also be obtained before a wireless receiving set can be used. This costs 10s. a year. In addition to the receiving set, at the home of the licensee, it allows the use of a portable set. *See* Carriage; Chauffeur; Dog; Gun; Marriage; Motor Car; Wireless.

LICHEN: A Skin Disease. Lichen is the name applied to a group of skin diseases characterized by the formation of papules. There is itching, which may be severe. The cause is considered to be a generally run-down and exhausted state of the nervous system. If the general health is below par a course of Easton's syrup, or some other tonic, sometimes does good. Arsenic is often prescribed.

For the itching a 1 in 40 solution of carbolic acid in water may be sopped on the spots. As a local application to the papules, the following prescription may be made into an ointment and applied locally twice a day:

Carbolic acid	10 gr.
Bichloride of mercury	2 „
Zinc oxide ointment	1 oz.

LIFE INSURANCE. Persons can insure their lives for almost any sum of money from £5 upwards. This is done through insurance companies or friendly societies that transact business of this kind. The premiums, usually paid half-yearly, vary according to the age and condition of the person insured. Full information on this point can be obtained from any insurance office.

In addition to the policies that provide for the payment of a sum of money at death, all offices issue policies payable at a certain age, say 60 or 65. A certain measure of relief from income tax is allowed on money paid as premiums on life insurance policies. *See* Annuity; Friendly Society; Income Tax; Insurance.

Lift. *See* Service Lift.

LIGATURE. Ligatures are cords of silk, catgut, or some other material used for tying arteries cut accidentally or in the course of an operation, to stop bleeding. *See* Bandage; Bleeding.

LIGHT: In Therapeutics. Light, which is a form of electrical energy, travels from its source in straight lines. The lines of transmission only maintain their direction, however, so long as the waves are passing through the same medium, say air. When they strike another medium the direction is changed, and the line is then said to be refracted. If a beam of sunlight is made to pass through a glass prism, a bar consisting of a succession of colours is produced, the order of the colours always being the same, namely, red, orange, yellow, green, blue, indigo, and violet.

This bar is called the solar spectrum, and represents the disintegration of visible light into its constituent parts, or colours, this disintegration taking place because these different rays of which white light is composed have different wave-lengths the longer having greater difficulty in passing through the prism, and therefore being more refracted. The longest waves are at the red end of the spectrum, and they become progressively shorter towards the violet end.

Beyond each end of the spectrum rays are passing, although they are not visible, simply because the eye is adjusted for the range of the ordinary spectrum only. Beyond the red end they have a longer wave-length than red rays, and are the invisible heat rays, whilst beyond the violet end they have a shorter wave-length than those of the latter rays. They are called the ultra-violet or invisible actinic rays, and are the most powerful as regards chemical action.

The ultra-violet rays have important functions in the processes of life, and their effect on human health is far-reaching. Those coming to us from the sun, however, are largely prevented from passing through the atmosphere by dust and moisture, and the supply is therefore very restricted in towns. Moreover, they are absorbed by ordinary window glass, so that they are not available in a room so protected. Arc lamps of various kinds are used to produce ultra-violet rays artificially, so that this method of therapy is readily available. The light from such lamps is sometimes described as artificial sunlight.

Exposure to ultra-violet rays will kill micro-organisms, and this explains the long-known disinfecting properties of sunlight. It also largely explains the success of ultraviolet rays in the treatment of skin disorders. The rays are absorbed by the blood, increasing its content of calcium, phosphorus and iron, and increasing its germicidal power.

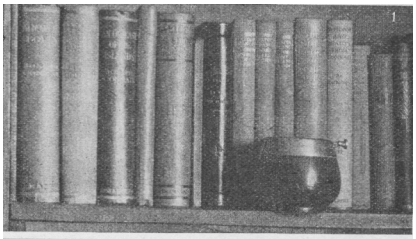
Exposure to ultra-violet rays also increases the vitamin activity of foods. In consequence of this the rays afford a powerful means of preventing and curing rickets. They have, in addition, a general tonic effect on the whole body and a tranquillising effect in states of irritability. Applications of the rays have cured sciatica and lumbago, headaches and neuralgia, and have been beneficial in a large number of other disorders.

Treatment by natural sunlight, or heliotherapy, is carried out at Alton and Hayling Island in connexion with the Treloar Homes, and elsewhere in Great Britain, and at Leysin in Switzerland and other places abroad. The value of light in the treatment of surgical tuberculosis was well established at some of those places a long time before its other possibilities were grasped. As ultra-violet rays form such a powerful weapon, however, their indiscriminate use, or,

particularly when they are artificially produced, their overdosage, is capable of doing harm. Even moderate doses are capable of causing quiescent tuberculosis of the lung to flare up into activity, and of doing other harm, so that this form of therapy is unsafe except under medical supervision.

LIGHT FILTER. All objects which contain colour will be more accurately rendered in a photograph by the use of a light filter, which is known also as a colour filter, colour screen, or orthomatic screen. A light filter is a piece of gelatine, dyed yellow, placed in front of the lens of a camera to filter out more or less of the blue light to which the ordinary plate is unduly sensitive.

This undue sensitiveness is very marked in outdoor photographs which include a portion of the sky. Although the sky may be full of clouds, nothing of them will be seen in the print made from an ordinary plate which is anything like sufficiently exposed. The blue rays in the light coming from the sky have so much more effect on the plate than the mixed rays coming from the objects in the landscape that the sky portion of the plate is seriously over-exposed and without detail. This is the cause of the harsh and unreal white skies seen in many photographs. A pale yellow filter overcomes this defect by absorbing a part of the blue from the white light passing through the lens.



Light Filter. Fig. 1. Photograph of a shelf of books made on an ordinary plate, without a light filter.

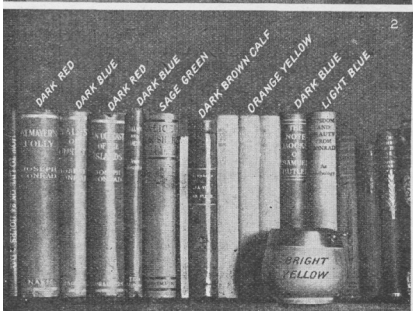


Fig. 2. Same books taken with a filter on a panchromatic plate. The difference in results is obvious.

A light filter has other advantages. Used in conjunction with orthochromatic or panchromatic plates, it permits the production of photographs in which colours are represented by differing tones in a scale of accuracy rising with the depth of colour of the filter used and the colour sensitiveness of the plate. For instance, an ordinary plate without a filter will represent a bright yellow as an almost black tone in print. The eye sees a yellow tulip as a bright colour and therefore a light tone, but the unaided plate is so much more sensitive to blue than yellow that the yellow of the tulip has little effect and is dark in the print. Again, the green varies in different trees, and when rendered into monochrome, or one colour, in a photograph they should appear as differing tones; this cannot be effected without a colour-sensitive plate, aided by a light filter.

An example of the difference in result obtained by the use of a mediun light filter is seen in the two illustrations. Fig. 1 was made on an ordinary plate without a filter; Fig. 2 was made on a panchromatic plate with a K 1½ filter. It will be noticed how incorrectly the red and blue look as represented in Fig. 1; also the darkness of the yellows.

LIGHTING: In the Home. Building by-laws lay down minimum requirements as to the area of the windows in every room, which is generally taken as 10 per cent of the floor area in sq. ft.; but this rule is only a guide and the allowance should be exceeded when- ever possible.

The regulations tend to develop a tall window, which may be satisfactory on north, east, or west, but is not so good as a long, low window on a southern wall, as in the summertime, when the sun is high, the long window restricts the amount of sunshine that can enter the room, as the wall above the window casts a shadow into the room; but in winter, when the sun is not so high in the sky, the rays of light pass more directly into the room. The result is that full advantage is obtained of the winter sunshine, while the intense light of the midday sun in the summer is moderated without detriment to the occupants.

In planning a house, windows should be placed so that early morning sunshine can have access to all working rooms. When it is not possible to place the windows in this way it is often feasible to provide a reflector or to whiten an adjacent wall, and so gain the advantages of increased lighting. Another aspect of natural lighting is the effect of colour, especially that cast by the window hangings. This is noticeable on the north side of the house even more than on the south, as the north light is always cold and cheerless. The use of brightly coloured curtains will correct this, as is easily proved by hanging flame-coloured curtains in place of white ones. Colours such as blue and grey on the south windows have a cooling effect, softening the glare of the sun.

Artificial Light. Artificial illuminants are numerous, the simplest being the candle, which still has its uses. Modern developments of oil as an illuminant have produced highly efficient lamps with an incandescent mantle. Various types are used in the home, from the ornamental floor standard or table lamp to the small hand-lamp.

Coal gas has many advantages, not the least being that one installation is available for lighting and heating. The wide choice of artistic fittings, the use of inverted incandescent burners, together with the by-pass system of control of the burners from a distance are factors which have greatly contributed to the value of gas as an illuminant. Gas lamps can be made movable by the aid of flexible metallic tubes, just as electric lamps can by the aid of wires. The article on Gas should be referred to for further information.

The great advantages of electricity as an illuminant are safety and convenience; there are no exposed flames, and the light is obtained or turned out with a simple switch. Moreover, electric lighting permits of decorative schemes which would not be practicable with an illuminant having an exposed flame. Useful information on this subject is given in the article Electric Light Fittings (q.v.).

Other kinds of artificial lighting are provided, by acetylene gas and air gas, but as a rule these are only used where persons are unable to get gas or electric light. Acetylene is sometimes used as an illuminant in farmhouses and detached country residences, as it can be produced by a small plant. It has, however, certain disadvantages. The producing apparatus must be housed in a building outside the house that is to be lighted, and great care must be taken that naked lights are not brought into this room. Smoking, too, is dangerous there.

Air gas or petrol gas is another illuminant often seen in country districts. It can easily be made by means of a small apparatus, and for it incandescent mantles are suitable. It is, however, dangerous if the proportion of petrol in it is between 2 and 5 per cent. On the other hand it is claimed that it vitiates the atmosphere of a room less than any other artificial light except electricity.

Theory of Illumination. Scientific experiment has shown that the human eye cannot sustain a brilliancy greater than about 5 candle-power per sq. in. of lighting surface, equal to the old-fashioned single-wick oil-lamp. The modern gas-burner and electric lamp have an intensity very many times greater, the high efficiency types of the latter reaching 3,000 candle-power and over per sq. in. For this reason the employ-ment of proper shades and diffusing globes becomes a matter of the greatest importance.

Three ways of dealing with the problem are in general use. They are known as the direct, that is, when the lamps are protected by shades; the semi-indirect, where they are protected by translucent bowls through which the light is filtered and diffused; and the indirect, where the lights are concealed behind cornices, mouldings and ornamental screens.

With all these systems the bulk of the light in the room is reflected from the walls and the ceiling. It is therefore very important that the light sources be placed in proper positions to give the most advantageous results. It may be assumed that indirect lighting takes twice the amount, and semi-indirect half as much again, as direct lighting, to produce equivalent lighting effect.

But the diffusion will not be similar, as the direct light is more concentrated, the indirect most diffused, and the semi-indirect the most pleasant for all-round lighting, apart from the beauty of the fittings that are available on this system. Therefore when a strong light is needed in any particular part of a room, the direct system is best, but for all general purposes the semi-indirect is preferable.

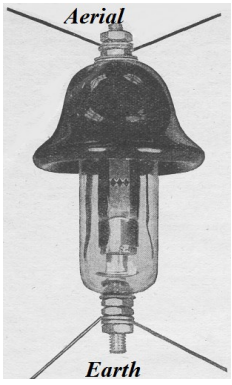
The colour of the wallpaper has an important bearing on the matter, as a dull or dark-coloured paper will take twice as much light for efficient illumination as will be necessary when the walls are papered with a light-reflecting colour. See Acetylene; Air Gas; Electricity; Gas.

LIGHTNING: Injuries From. Injuries due to lightning may be slight and temporary, or may consist of severe wounds and permanent damage to the brain and other organs.

When insensibility results, it may last only for about 5 or 10 minutes, or may endure for an hour or two. In this condition the pupils of the eyes are dilated, the victim breathes very slowly, and the pulse can scarcely be felt. Except in immediately fatal cases the patient usually recovers in a short time.

A doctor should be sent for, and in the meantime rub the limbs and pile coats on the patient, if necessary, to keep him warm. If he is unconscious, put smelling-salts to the nose, and as soon as he can swallow a stimulant should be given, either a little spirit, a teaspoonful of sal volatile in water, or hot coffee. When the patient gets to bed hot-water bottles should be put to the feet, and if there is collapse the foot of the bed should be raised. In case of almost imperceptible breathing artificial respiration (q.v.) should be practised.

Lightning Arrester. This is a device used in conjunction with the aerial of a wireless apparatus. It is intended to protect the building from the effects of lightning, which might be attracted by the aerial and directed into the building.



Lightning Arrester. Device used as a safety precaution, with hooded insulator and enclosed gap which breaks down at a comparatively low voltage.

The device generally comprises a small gap between two conductors, which are joined to aerial and earth respectively. In the event of an atmospheric or lightning discharge, the current goes to earth by way of the gap, in preference to the path of greater impedance through the aerial circuit of the receiver.

Common types of arrester employed in broadcast reception consist of a hooded insulator and an enclosed gap which breaks down at a comparatively low voltage. A bracket is provided by means of which the device can be fixed to the window frame or wall outside the house. One terminal of the arrester is connected to the aerial lead-in, and the other terminal is joined to earth. An arrester may be employed in conjunction with, or instead of, an earth switch.

Lightning Conductor. The functions of a lightning conductor are first to cause rapid leakage of electricity

between a thundercloud and the earth, so that the charge contained in the cloud is reduced to such an extent as to be harmless; and secondly, if the leakage action has only been partially successful, to provide a safe path to earth for the lightning flash, so that it does little damage, if any, and that only to the lightning conductor and not to the house it protects.

A charge of electricity leaks readily off a sharp point, and therefore the first requirement is met by providing three or four such points round the top of the main vertical lightning rod whose lower end is efficiently earthed. The second requirement is met nine times out of ten by the same vertical rod, but practically certain protection is afforded if the building is enclosed in an earthed metallic network. This result is readily achieved by electrically connecting all such external metal work as rain-pipes, gutters, metal roof-sheeting or lining, metal casement frames, etc., to the main conductor. These connexions are known as subsidiary conductors.

The need for protecting a house is perhaps less if the adjacent house is protected, but is certainly greater if the house is higher than its neighbours or stands alone.

LIGHTS. The lungs of animals used for food are known as lights, and were formerly included in the fry, but are now only employed as food for cats and dogs. They should be well washed, soaked, if possible, boiled for about ¾ hour, and then cut in pieces. *See* Cat.

LIGNUM VITAE. The hard, heavy wood known as lignum vitae comes from S. and Central America. It is used in furniture making. In the 17th century it was employed for marquetry, and was much used later for inlaid furniture by Sheraton and others. *See* Wood.

Ligustrum. This is the botanical name for privet (q.v.).

LILAC. The botanical name of lilac is syringa, a word commonly and wrongly used to denote the mock orange or philadelphus. This hardy flowering shrub (Syringa vulgaris) is represented by numerous single and double varieties of various colours. It thrives in ordinary well-tilled soil, but is liable to be disappointing if not pruned correctly. When the flowers are over, old weak branches should be cut out to prevent overcrowding, and some disbudding or the removal of superfluous young shoots is necessary. Suckers, shoots which grow through the soil from the stock on which the named variety of lilac is grafted, must be pulled up. It is beneficial to topdress the soil with manure in early summer. The best method of propagation is by layering in summer. The common lilac attains a height of about 20ft., and has smooth,
heart-shaped, opposite leaves.

Some of the best single varieties are Marie Legraye, white; Charles X, rose purple; Souvenir de L. Spath, reddish crimson. Good double ones are M. Buchner, lilac; Charles Joly, reddish; Mme. Lemoine, white. The Persian lilac (persica) is an attractive shrub, 3-4 ft. high, bearing fragrant lilac-coloured blooms very freely.

For forcing, the lilacs should be potted up in autumn in the usual potting mixture and kept out of doors until they are needed. They should then be taken indoors and kept in a temperature of from 50° to 55°, and syringed daily. Increase the temperature when the buds burst. Prune back flowering shoots after blooming, and place the plants out of doors. They will be of no more use for forcing, but may very well be used in the open. Fine grained in character, the wood of the common lilac is employed in inlaying and turning. *See* Flowers; Pruning.

LILY. The true lilies (lilium) are delightful flowering bulbs, some of which must be regarded as indispensable in every garden. While a few need special conditions to ensure success, most of them are hardy and easily managed if given correct cultivation. The most popular of all is the Madonna lily (Lilium candidum), which bears white, fragrant flowers on stems 3-4 ft. high in June. The bulbs should be planted in August-September, 3 in. deep, in ordinary well-cultivated soil. As this lily is liable to the attacks of a troublesome disease the bulbs should be shaken in a bag of sulphur before being planted, and it is wise to mix sulphur freely with the soil.

Other showy hardy lilies to plant in late summer or early autumn are croceum (orange lily), 3 ft., orange red, July; elegans, 12 to 30 in.; yellow, red, June and July; Hansoni, 3 ft., yellow, June; Henryi, 5-6 ft., apricot, August-September; Martagon, 2-3 ft., reddish purple, June-July; pardalinum (Panther lily), 5-7 ft., yellow and red, July; pyrenaicum, 2-3 ft., greenish-yellow, May-June; testaceum, 4-5 ft., light yellow, June-July; tigrinum (tiger lily), orange red, 3-5 ft., August-September; umbellatum, 2-3 ft., orange red, July.

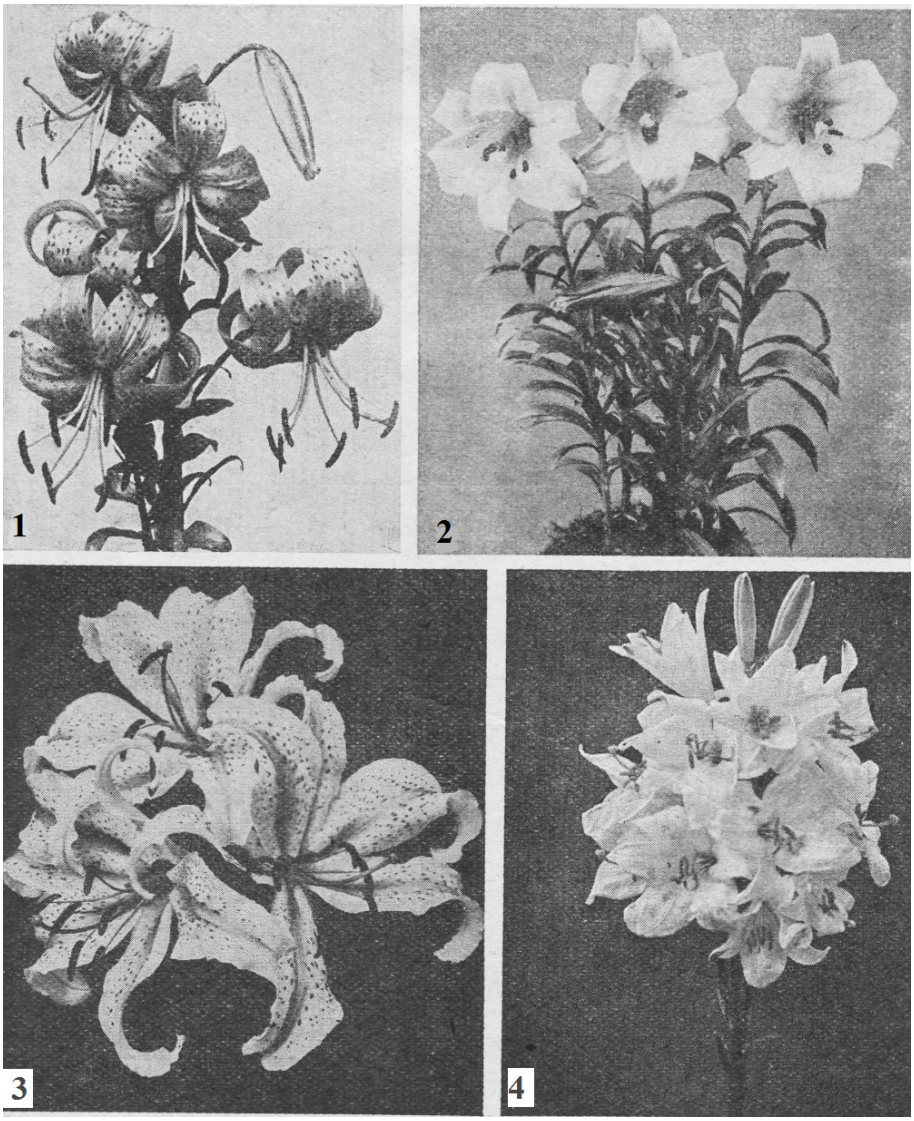
Bulbs of Lilium auratum, white flushed with yellow, and speciosum, rose and white, arrive in Great Britain in the New Year, and are planted in February and March. There are several fine varieties of these lilies; auratum rubro-vittatum and speciosum melpomene are richly coloured.

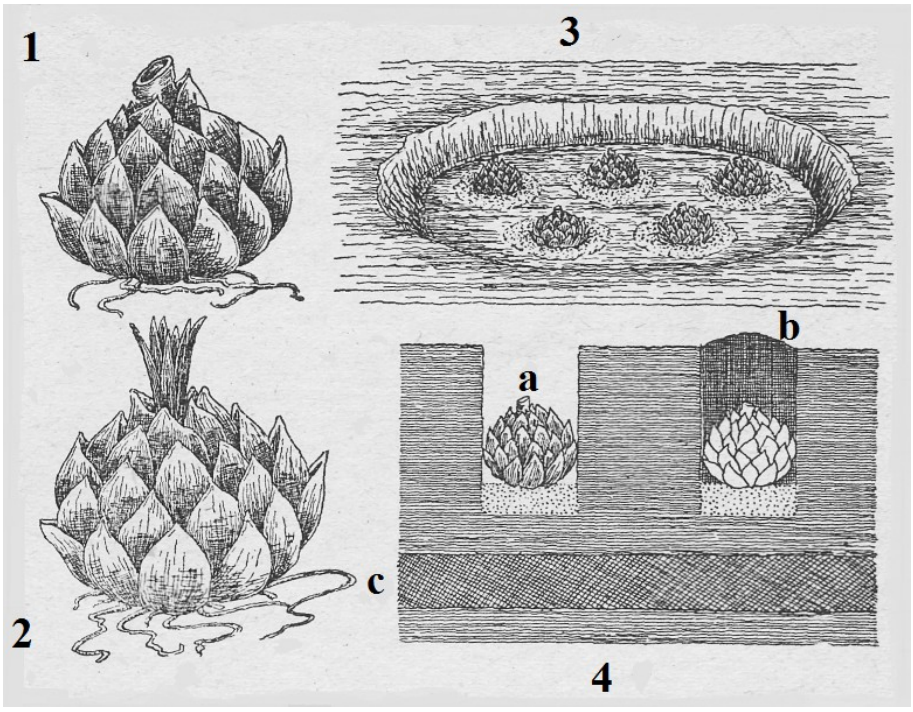
All the lilies mentioned above (with the exception of auratum, which often deteriorates after the first year) will flourish out of doors if planted in deeply dug soil with which leaf-mould and sand have been mixed freely. In heavy land the bulbs should be set on sand. It is necessary to set the bulbs at the correct depth, and this varies according to whether the lily belongs to the stem-rooting class or not. The following produce roots at the base of the stem as well as below the bulbs, and should be covered with 5-6 in. of soil: auratum, croceum, elegans, Hansoni, Henryi, regale, speciosum, tigrinum. The others named need a covering of only about 3 in. of soil.

Of numerous other lilies which are available for cultivation in gardens the most remarkable is Lilium

(*Continued in page 1294)*

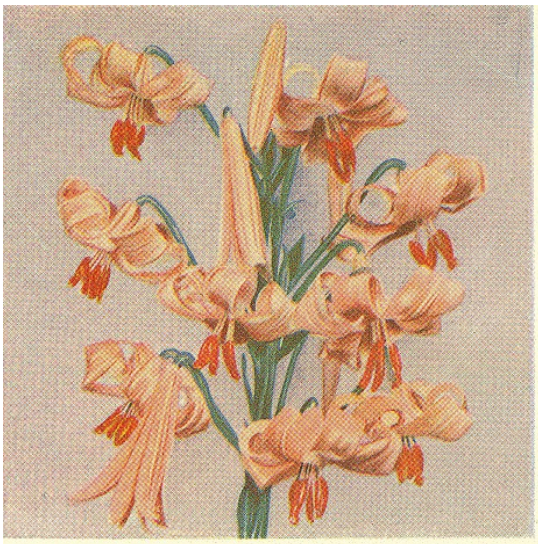
Lily. Examples of lilies suitable for the garden and the greenhouse.
Fig. 1. Tiger lily, orange-scarlet.
Fig. 2. Japanese lily.
Fig. 3. Speciosum rubrum, white with crimson spots.
Fig. 4. Madonna lily.





Lilies grown in the garden.

1. Good dormant bulb.
2. Same, starting growth.
3. Planting lilies in groups, bulbs resting on sand.
4. Another method of planting;
a, bulb resting on sand;
b, covered withg fine soil;
c, manure.



Nankeen Lily



Chinese Lily



Turk's Cap



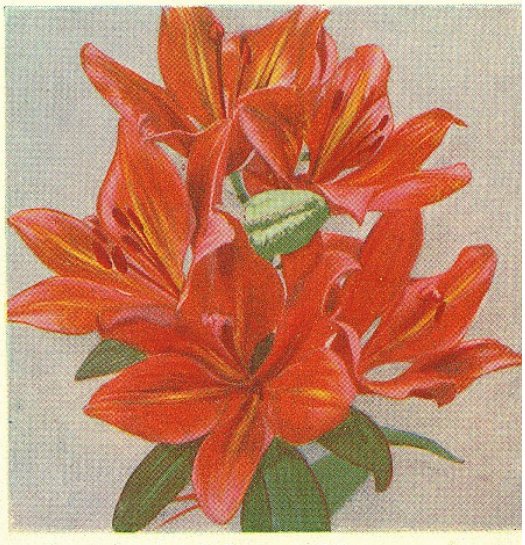
Madonna Lily



Tiger Lily



Speciosum Rubrum



Umbel-flowered Lily

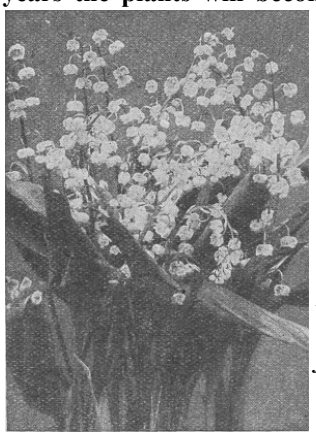
LILY

Suitable examples for garden and greenhouse.

giganteum, which, when established, throws up a giant, leafy stem 8 to 10 ft. high and bears large, fragrant white flowers. It likes partial shade and moist, leafy soil The bulbs die after flowering, but are perpetuated by offsets.

The favourite lilies for cultivation in pots are auratum and speciosum and their varieties, tigrinum and longiflorum (white trumpet lily). The bulbs should be obtained in autumn, winter and early spring as they are available, and set singly in well drained pots 6 to 8 in. wide, using a compost of two-thirds loam, one-third peat or leaf-mould (or both), with a free addition of sand. The bulbs must be set low down in the pots to leave room for top dressing with fresh soil later on: they are partly covered with soil, and the remaining space is filled with fibre, which will be replaced with soil when the bulbs begin to grow. They should be placed in a frame from which frost is excluded. In summer the lilies may be grown out of doors or in the greenhouse. Lilies can be raised from seeds, but the seedlings of most of them grow slowly. Lilium regale will bloom in two years from seed sowing. *See* African Lily; Arum Lily; Belladonna Lily; Guernsey Lily, etc.

LILY OF THE VALLEY. This favourite spring-flowering hardy plant flourishes in shady places in soil with which leaf-mould and decayed manure have been mixed freely. It is not a true lily, its botanical name is Convallaria majalis. The roots of lily of the valley, which are known technically as crowns, should be planted in October, 3 or 4 in. apart, the tops just below the surface of the ground. An annual top-dressing of leaf-mould in October should be given. In the course of years the plants will become overcrowded and fail to bloom freely; they should then be lifted and replanted in early autumn. The finest variety is Fontin's, which has unusually large blooms, in one named rosea the flowers are tinged with pink.



Lily of the Valley. Beautiful clump of this fragrant flower, grown in a pot.

There are many methods of forcing to provide early blooms under glass. One of the simplest is to put a bundle of crowns into damp moss and put them on hot-water pipes. Another is to place as many crowns as will go comfortably into a 6 in. pot in a compost of sandy loam and leaf-mould, and introduce into bottom heat. Good crowns will produce flowers in two to three weeks if plenty of tepid water is used.

Crowns alone need not be used in the culture of lily of the valley under glass. Imported clumps may be potted in autumn, kept in a frame for a few weeks, and then put in the greenhouse. They will bloom in spring. Large-flowered varieties are now available. Excellent lilies of the valley for all purposes are available at any time of the year, by obtaining what are known as retarded crowns, and forcing them on. *See* Flowers.

(See also page 1296)

LILY POOL: How to Make. Even in small gardens which possess no such facilities as running water, the cultivation of the water lily is not difficult, if a satisfactory pool can be provided. Tubs, barrels, tanks, or old cisterns will serve the purpose if placed in an open, sunny aspect, with periodical changing of water. All that is required is a drain-off plug and bottom foundation of brickbats, as illustrated. A more permanent structure may be made in the form of a round, oval, or square pool with a good foundation of cement. April and early May are the best months for constructing a pool, as the hardiest water lilies are then ripe for planting.

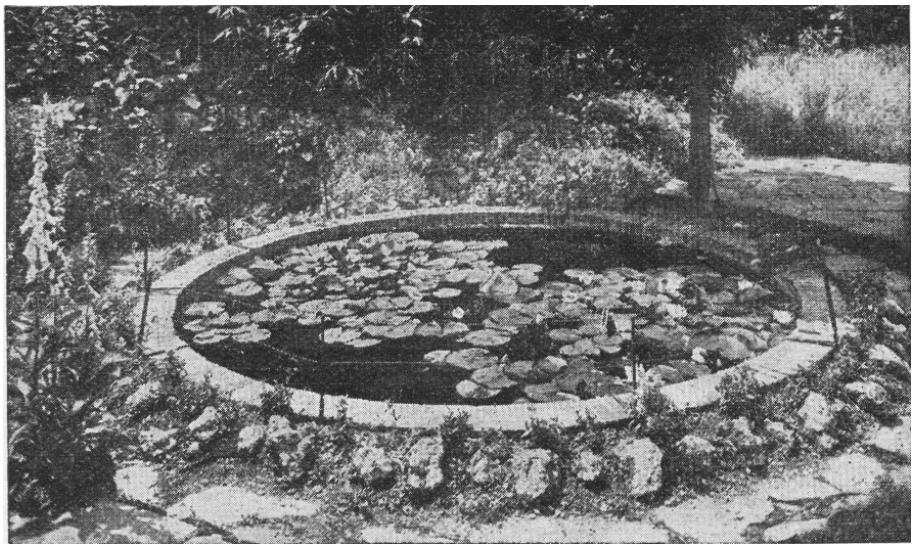
The two sectional diagrams 4 and 5 give the details for a pool of moderate size. Materials and implements required consist of cement and shingle, straight-edge, spirit level, spade, and a bricklayer's trowel. The bases of constructional work are excavation and lining of concrete, faced with cement mortar, trowel-finished and smoothed; and a draining pipe with wooden plug as shown.

Draining the Pool. The concrete basin or pool should have a thickness of about 8 in.; its water depth may be something under 3 ft. On sloping ground it is quite practicable to associate two or more pools, with pipes connected to the basin possessing an outlet pipe of sufficient size to permit quick drainage. This is important, as the plants will suffer if time is lost between emptying and refilling. A more ambitious design is shown in Fig. 6, which contains a centre pool with flag-stone margin, rose beds, and grass. Such pools generally draw their water from a stand-pipe or tap, and therefore a convenient and suitable spot must be selected for their construction.

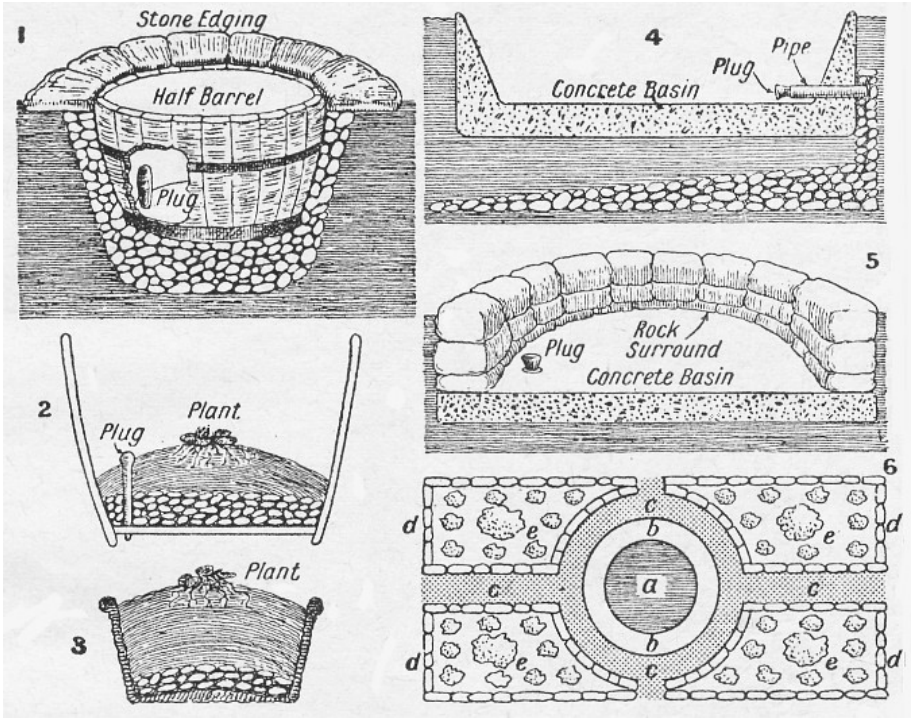
After construction of the pool, when its components appear to be well set, fill it with water to be the desired level, take careful register of depth, and leave it for a week or 10 days. If no rain has fallen, measure the depth again, and if there should be any appreciable drop from the original depth, drain off the pool and give the whole another facing of cement mortar. The cause of the leakage may be a crack or fissure, and in that case the necessary filling may be done and the pool tested as before. It is essential that any leakage should be stopped immediately.

The Contents. It must be remembered that the plants are gross feeders, and an excellent compost for their needs is made of two parts mud from the bottom of a ditch or pond, two parts loam, one part coarse sand, and one part of rich manure free from straw. A layer of crocks should be placed on the cement floor, then a good layer of the above mixture, followed by mounds of the same compost for each plant with its

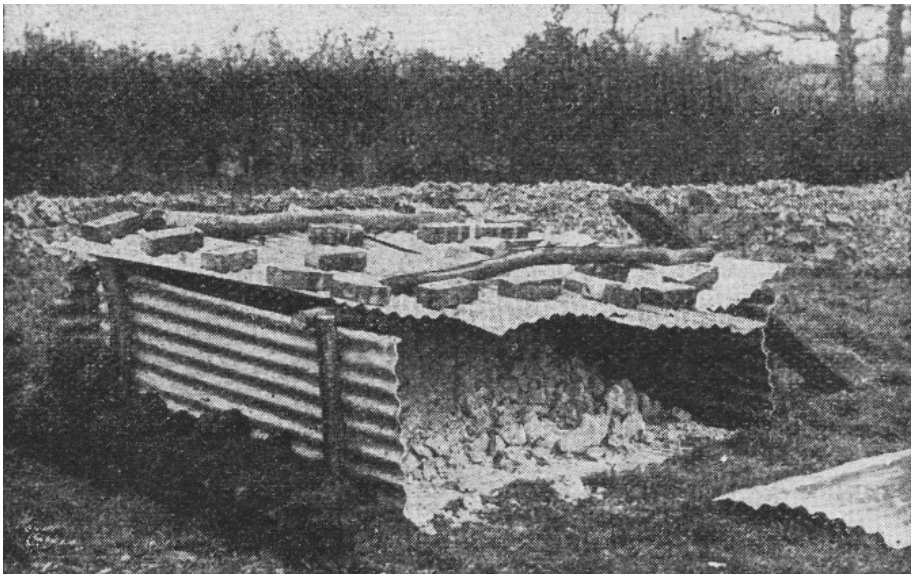
(Continued in page 1300)



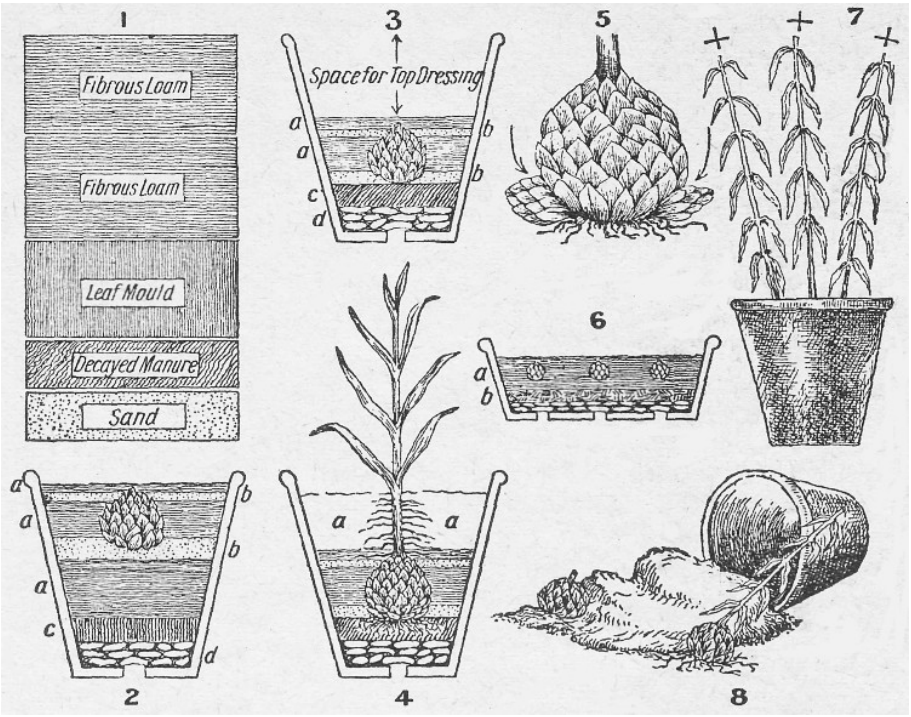
Lily Pool. **Charming example of a lily pool with a brick edge and paved surround. (Humphrey and Vera Joel)**



Lily Pool. Making a pool for water-lilies.
1. Small tub-pool.
2. How to plant in tubs.
3. Planting in wicker basket.
4. Good type of concrete pool in section.
5. Section through pool with rock sides and concrete base.
6. Plan for a pool garden;
a, lily pond;
b, flagged rim;
c, paths;
d, flagged edgings;
e, roses or ground lilies.



Lime: for building.
Lime stored in a temporary structure in order to protect it from rain. The lump lime is laid upon boards set upon bricks, and a little trench is dug round it.

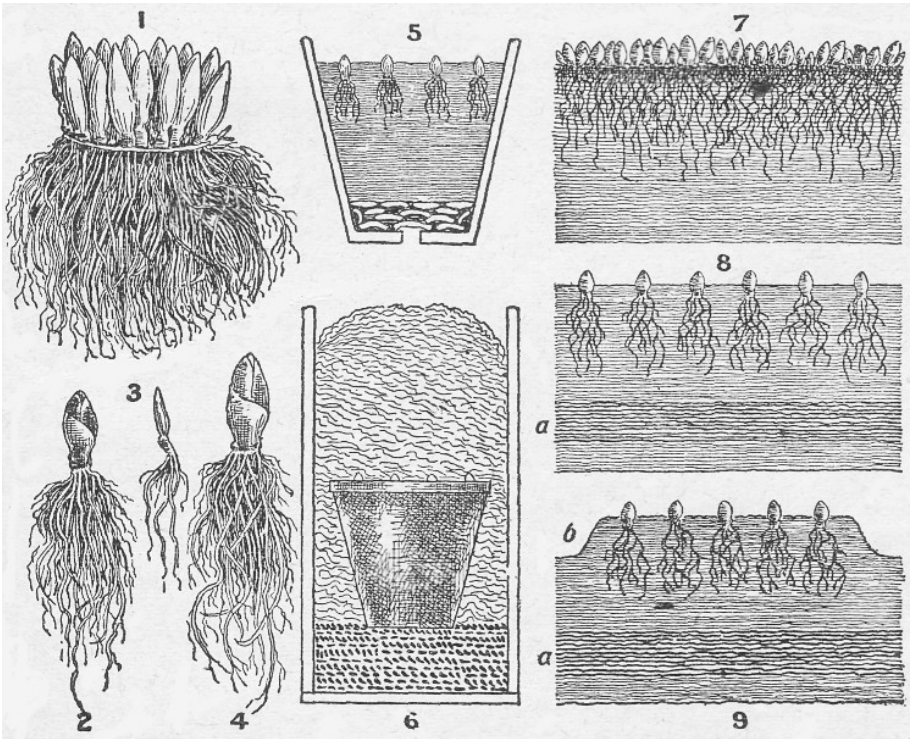


Lily: pot culture.

1. Components of a good compost.
2. Planting non-stem-rooting bulb; *a* , compost; *b* , sand; *c,* rough soil; *d,* crocks.
3. Planting stem-rooting bulb; *a* , compost; *b* , sand; *c* , rough soil; *d,* crocks.
4. Top-dressing a stem-rooter; *a* , top-dressing to feed the roots shown.
5. Bulb offsets.
6. Same planted to make growth; a, compost; *b* , rough soil.
7. Seed-pods removed to facilitate dying down.
8. Pot emptied of old soil and bulbs ready for repotting

Lily of the Valley.

1. Bunch of crowns as sold for forcing.
2. Good crown that will grow on.
3. Useless specimen.
4. Excellent type.
5. Crowns planted in a pot.
6. Same, placed in box on a base of cinders and covered with fibre.
7. Overcrowded outdoor colony.
8. Same, replanted; *a* , decayed manure.
9. How to plant on moist soils; *a,* manure; *b,* raised bed.



apex 1 to 2 ft. below water level.

The roots must not be planted too deeply, but simply covered sufficiently to allow the crown of the plant to peep through the soil. If preferred, the lilies may be planted in wicker baskets holding a few bushels of compost, and sinking each in any desired position. Such baskets sometimes rot away, but generally the plant roots form a network which holds the soil together. Planting operations are shown in the diagrams.

There are numerous varieties of Water-lily suitable for various depths of water. The most vigorous flourish in ponds, others grow in water only 8-10 in. deep. *See* Water Lily.

Lima Bean. This is an alternative name for the butter bean (q.v.).

LIMB. The upper extremities or limbs are attached to the trunk by the shoulder blades and the collar bones, and the lower ones by the innominate bones. The shoulder blades are bound to the chest wall by muscles simply, and this allows of very free movement, while the innominate bones take part in the formation of the pelvis, move little, if at all, and thus promote stability in standing and walking. *See* Bandage; Fracture.

LIME: The Tree. The lime tree or linden (Tilia vulgaris) is much favoured for town planting, and is met with in numerous suburban gardens. It bears yellow flowers in July, with a rich and rather cloying odour. The leafy, half-winged bracts which fall so abundantly with the accompaniment of moisture after the flowering are also a feature. The tree loses its freshness rather early in autumn. Tilia petiolaris and dasystyla are to be preferred to the common lime because the leaves do not fall so early.

The lime thrives best in substantial loam or friable clay, but it may be planted in most soils and in most situations that are not distinctly bleak or dry. Propagation is by layers in autumn. *See* Lime Juice.

LIME: For Building. Lime is a natural cement, and there are various qualities and grades, of which those used for building are the blue lias, and the grey or chalk. Lime requires dry storage. Quick lime, before it can be used, is slaked with water.

Lime is best slaked by spreading it out upon a board, covering it with a small proportion of sand, and sprinkling the whole with water from time to time, turning the lime over until it is thoroughly slaked. It should be allowed to stand for at least a month before use. For plaster work lime should be slaked by providing a tub, or by digging a hole in the earth and lining it with boards, two-thirds filling it with lump lime, covering it with water, and allowing it to remain for several weeks until it is a thick creamy mass. It is then known as lime putty, and is used in conjunction with sand or other ingredients.

Lime is purchased from builders' merchants, and when ordering it is well to state the purpose for which it is required. For instance, lime for mortar will be blue lias, and lime for plaster-work pure or fat lime, these expressions referring to the setting properties. Rich limes are those which only contain about 6 per cent of insoluble impurities, and are used for plastering because of their readiness to slack, and their consequent non-liability to blister as compared with hydraulic limes.

The rapidity of setting of lime depends on the quantity of other substances it contains which render it independent of external agents for its setting properties. The limes containing about 15 per cent of such substances are termed feebly hydraulic. Those containing about 25 per cent are moderately hydraulic, and those containing from 25 to 35 per cent are eminently hydraulic. The last named grades are most suitable for constructional work.

Lime in the Eye. If lime gets into the eye the consequences may be serious unless medical treatment is promptly obtained. Therefore, no matter how trifling the injury may appear to be, the doctor should be sent for at once. In the meantime the eye should be washed thoroughly with tepid water and vinegar, a teaspoon-ful of vinegar in half a tumbler of water; or with large quantities of tepid water alone. Afterwards drop a little olive oil into the injured eye. *See* Ceiling; Mortar; Plastering.

LIME: For the Garden. Lime is most valuable for application to new gardens and to old gardens which have been heavily manured for a long time. Heavy soils are rendered more workable by its aid, and it also sets free various plant foods. In addition, it acts as a soil insecticide. To light soils lime is best applied in the form of chalk. A stone (14 lb.) of lime per pole is a good average quantity to use.

Chalk may be applied to the extent of double this amount. The dressing may be repeated every three or four years. Gas lime, i.e. burnt lime, is an excellent thing to apply in autumn to vacant land which is pest ridden.

Lime Sulphur. This is a useful spraying mixture for apples and pears in spring and early summer. The Ministry of Agriculture (Bulletin 5) describes its preparation and use.

It may be purchased ready made in large or small drums, so that it is only necessary to dilute it to the proper strength. For spraying against apple and pear scab summer strength lime sulphur, namely 1 gallon of concentrated solution mixed with 29 gallons of water, should be used. The lime sulphur should be poured slowly into the water, stirred well, and used at once. Spraying machines with copper parts should not be used for lime-sulphur spraying. It should be noted that Cox's orange pippin and James Grieve are particularly sensitive, and for these varieties, and also for Wellington and Newton Wonder, half summer strength

is necessary, namely 1 gallon to 59 gallons of water. *See* Apple; Bordeaux Mixture; Garden; Manure; Pear; Spraying.

LIME: In Medicine. Salts of lime form a most important constituent of our food. They are required to provide the earthy matter, or calcium phosphate, which imparts hardness to the bones. Calcium salts are necessary for the coagulation of blood, and in other ways they perform an important part in the body chemistry. Some foods are poor in lime; for instance, fish, meat, fruits, and potatoes. Others contain it in abundance, among them being milk, eggs, oatmeal, wholemeal bread, and some varieties of green vegetables.

The calcium compounds are of great use in medicine. Calcium chloride, 5 to 15 grains, and calcium lactate, 10 to 30 grains, are remedies against bleeding. These are also good remedies to take for chilblains, and in some cases of urticaria, or nettle-rash. Calcium hypophosphite, 3 to 10 grains, calcium phosphate, 5 to 15 grains, and syrup of lactophosphate of lime, ½ to 1 dram, are good general and nerve tonics. The carbonate of calcium or chalk has the same action and uses.

Lime Water. Lime water acts as an antacid and a mild astringent, and is often taken in milk for dyspepsia and diarrhoea. The lime water is added in the proportion of 1 to 3 of milk. It is often added to a baby's milk mixture to make it more digestible. It enters into skin lotions for weeping eczemas, burns, and other conditions. For a burn in which the skin is not broken it may be mixed with an equal quantity of olive oil or of linseed oil (Carron oil).

Poisoning by Lime. Chalk is a good antidote in poisoning by acids. In any case of lime poisoning give draughts of weak vinegar and water, or lemon juice and water. Follow these with warm milk, cream, olive or cod liver oil, or barley water. Apply hot poultices or fomentations to the abdomen for the pain. The physician should be called in at once.

LIME JUICE. The fruit of the lime tree common in tropical countries closely resembles the lemon, but is smaller and more sour. The juice has medicinal qualities of an antiscorbutic character. It has a cooling effect, and when added to water or soda water makes a refreshing drink. Several preparations of lime juice are on the market. *See* Lemon.

LIME PUTTY. Also known as plasterer's putty, this is made by slaking chalk lime, allowing it to stand in a tub with water for some weeks. It ultimately becomes of a thick, creamy consistency, and is then used for making plaster. Other relevant entries are: Coarse Stuff; Gauged Stuff; Lime; Plastering.

LIME WASH. Lime washing, or lime whiting, is the process of treating exterior or interior surfaces with a mixture of pure lime and water, which is applied hot with a stiff brush of substantial proportions. In preparing the lime wash, a sufficient quantity of quicklime should be put into a tub or old box that is reasonably water-tight, and the lime covered with boiling water. After it has dissolved, sufficient hot water is added to make an easily workable mixture, a quantity of which may be put into a bucket and stirred as required.



Lime-washing the interior of a shed.

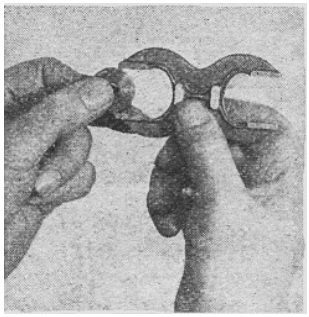
Before applying the lime wash, the surface to be coated should be washed down with soda water, and in the case of outbuildings, such as poultry houses and the like, a little soft soap can be added to the washing water. The walls should be sprayed with a strong solution of disinfectant, such as carbolic acid, diluted with water in the proportion of 35 parts of water to 1 part of carbolic acid, and sprayed on by means of a garden syringe fitted with a fine rose head.

As soon as the carbolic is dry, the whole surface is coated with lime wash, and, to assist it to harden and adhere to the woodwork, a little common salt and sulphate of zinc may be mixed with the slaked lime. The proportions are 2 lb. of salt, and about twice the quantity (i.e. 4 lb.) of zinc sulphate to a bushel of lime. The best brush to use is a well-worn whitewash brush, and the wash should be applied vigorously, so that it is driven well into the surface. If necessary, two or more coats may be given, according to the nature of the work to be done.

After walls or ceilings have been repeatedly coated with lime wash, the surface will show a tendency to flake and chip off, and in such cases the old lime wash should be thoroughly well washed and scraped off. Lime wash should not be confused with whiting, which is made up with powdered chalk. *See* Distemper; Whitening.

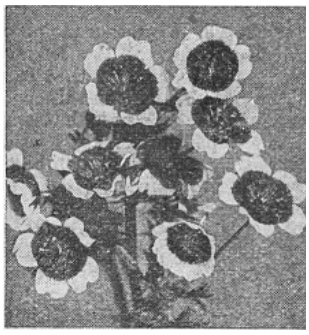
LIMIT GAUGE. This is a measuring device used as a standard of comparison. The term limit means that the permissible error is limited, or in other words that a piece of work to be measured with it must be within a certain predetermined degree of accuracy. The one shown in the illustration is seen gauging the diameter of a disk of steel. The gauge has two sets of jaws, one a little larger than the other, and known as the go gauge, because the article must go into the jaws, and the other as the not-go gauge, because the

article must not go into it. Thus the actual size of the article must lay between the two, and its absolute dimensions are limited. *See* Gauge.



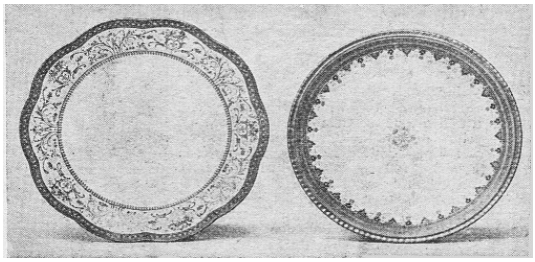
Limit Gauge, measuring the diameter of a disk of steel

LIMNANTHES. A pretty, low-growing hardy annual with yellow and white saucershaped flowers. Limnanthes Douglasii, 6 in., is the only one grown. Seeds are sown out-of-doors in April where the plants are to bloom in summer, or they may be sown early in September for spring flowering. Self-sown seedlings are usually numerous.



Limnanthes. Yellow and white blossoms of the hardy annual L. Douglasii.

LIMOGES: The Ware. The hard-paste porcelain which was produced at this ancient town in central France for about 70 years after 1780 was decorated on a highly glazed translucent body. An early mark is C.D. If combined with the Sèvres mark it means that the body was made at Limoges, which had the advantage of its own china-clay beds, and was decorated at Sèvres, whose own ware was soft-paste. Biscuit figures and medallions were marked Limoges. The very large range of pigments introduced by Limoges chemists has been adopted by other French potteries, and gives to these products their characteristic variety of colour.



Limoges Ware. Two plates, typically patterned examples of this beautiful French hard-paste porcelain. (Courtesy of J. Chomette & Sons. Ltd.)

Still another special development was the artistic treatment of the chromo transfer and the gold transfer, thereby imparting to decorated Limoges the effect of hand-painted wares. In the middle of the 19th century American enterprise took the local industry in hand, and there is now a large output, by a score of factories, of modern Limoges ware. Among these the name of Pillivuyt survives from the early period.

That which bears the mark Haviland & Cie is a strong ware, deco-rated in styles sometimes suggestive of Moorish art. There are also inexpensive dinner services and other useful pieces with floral and scenic designs.

END OF PART 1